Policy Evaluation – Regression Discontinuity Analysis

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Based upon “The Incumbency Curse: Weak Parties, Term Limits, and Unfulfilled Accountability” by Marko Klasñja & Rocio Titiunik

# Introduction

Reproduction of results in the field of scientific research is a growing topic of concern among the scientific community. By analysing and reproducing some of the results of the paper “The Incumbency Curse: Weak Parties, Term Limits, and Unfulfilled Accountability”, one can hope to reach a deeper understanding of the Regression Discontinuity method and also to develop one’s awareness of the need to create reproducible results when producing an academic paper.

Furthermore, a new application of the data provided by the study will show us that…

1. Literature

The method of Regression Discontinuity has been developed in 1960 (Thistlethwaite & Campbell, 1960) and has since then been implemented in most statistical software. Three researchers have been working on implementing it in Stata, the software used in the following paper. They are Calonico, Cattaneo and Titiunik. They have been working consistently on describing technical and methodological details of the Regression Discontinuity method has well and the following work will be based both upon material seen in class as well as their paper describing the foundations of Regression Discontinuity in R and Stata (Cattaneo, Idrobo, & Titiunik, 2019).

Notably, Professor Titiunik is one of the authors of the paper whose results are reproduced hereafter.

1. Methods & Data

* *Explain the identification problem in a context-specific way (why not with and without comparison?)*
* *Explain methods used in the paper and try to relate the explanation to the Potential Outcomes Framework on causal inference*
* *State identifying assumptions in a context specific way*

The topic of the paper is the analysis of mayoral elections results in Brazil over a period ranging from 1996 to 2012. The researchers want to analyse whether “[…] the presence of term limits and weak political parties affect the incentives and behaviour of individual politicians such that the parties suffer systematic losses”.

The authors could not assume that the treatment assignment of winning an election was randomly assigned \*\*\*\*\*\*\* **(add on why not use simple methods)** and therefore used a regression discontinuity model on the municipalities where a party barely lost and compared it to municipalities where they barely won so to “[…] isolate causal effects of winning office from the spurious correlation between current and future electoral success”.

Regression Discontinuity (RD) designs have three key characteristics defining them.

The first is a score assigned to each individual unit considered, the second is a cut-off value that determines whether or not the units considered have the treatment effect considered assigned to them. The third element is the treatment effect in itself.

There are several important considerations to keep in mind when considering RDs, the value of the information provided by them is (usually) local and only evaluable right before and right after the cut-off point, they are local by construction.

In our case, the three fundamentals elements are well defined as each municipality is a unit, the cut-off is at a margin of win/loss of 0 and is strictly respected, indeed, winning an election gives access to mayoral powers without any exceptions.

An assumption of RD designs is that there exist conditions that allow to assume that units near the cut-offs only differ in the treatment effect considered. Another assumption is continuity in the functions of the independent variables both before and after the cut-off value.

In traditional RD designs, the treatment effect is defined as the difference in value of the dependent variable’s mean right before the cut-off with its evaluation right after it.

***How deep into the description of RD designs and its use in the paper should I go? MSE minimization explained as well, for instance?***

* *Describe the ideal experiment*
* *Describe the data used: Source, randomness of sample, size of sample, missing values and brief discussion of the variables used*

The dataset used for the study comes from the merging of “[…]a municipality-level dataset of demographic and socioeconomic variables obtained from the Institutito Brasileiro de Geofrafia e Estatistica (IBGE), with election returns and characteristics of individual candidates, parties and coalitions for mayoral and municipal legislature elections for 1996,2000,200,2008 and 2018, obtained from Brazil’s Tribunal Superior Eleitoral”. It contains 27 455 municipality-year observations and 5564 unique municipalities.

There were multiples variables present in the dataset, some such as GDP per municipality, population per municipality which were used for descriptive analysis purposes and others such as the margin of win (expressed in percentage) as well as whether each considered party had run or not.

The political parties considered were different in regard to the hypothesis posed by the authors. More precisely, the PT (Workers Party) was deemed big and cohesive enough to have an impact on their politician’s actions given their future power over them. Then, there are the \*\*\*\*\*\***(Describe each party)**

Notably, most of the analysis focused on a subset of the dataset above-mentioned as the particularities of RD designs lead to focus on close races, meaning those situated around the cut-off point, and therefore only 2 701 observations were kept.

1. Results

* *Results of replication analysis. Application of method used in class and the extent to which comparison between your results and those of the paper.*
* ***At least one of the main treatment effect estimates should be replicated as well as a presentation of less complex analyses***
* ***Extension using Matching or RA and might need to add covariates.***
* ***Present and compare at least two estimates of the treatment effect***

1. Conclusion
2. References

Cattaneo, M. D., Idrobo, N., & Titiunik, R. (2019). *A Practical Introduction to Regression Discontinuity Designs*. https://doi.org/10.1017/9781108684606

Thistlethwaite, D. L., & Campbell, D. T. (1960). Regression-discontinuity analysis: An alternative to the ex post facto experiment. *Journal of Educational Psychology*, *51*(6), 309–317. https://doi.org/10.1037/h0044319