Uncovering Time-Specific Heterogeneity in Regression Discontinuity Designs

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Publication Date: Friday, 6 of November 2020

Abstract
The literature that employs Regression Discontinuity Designs (RDD) typically stacks data across time periods and cutoff values. While practical, this procedure omits useful time heterogeneity. In this paper we decompose the RDD treatment effect into its weighted time-value parts. This analysis adds richness to the RDD estimand, where each time-specic component can be diffent and informative in a manner that is not expressed by the single cutoff or pooled regressions. To illustrate our methodology, we present two empirical examples: one using repeated cross-sectional data and another using time-series. Overall, we show a signicant heterogeneity in both cutoff and time-specic effects. From a policy standpoint, this heterogeneity can pick up key differences in treatment across economically relevant episodes. Finally, we propose a new estimator that uses all observations from the original design and which captures the incremental effect of policy given a state variable. We show that this estimator is generally more precise compared to those that exclude observations exposed to other cutoffs or time periods. Our proposed framework is simple and easily replicable and can be applied to any RDD application that carries an explicitly traceable time dimension.