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Minimum Distance Estimator for Sharp Regression Discontinuity with Multiple Running Variables

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In typical regression discontinuity, a running variable (or ‘score’) crosses a cutoff to determine a treatment. There are, however, many regression discontinuity cases where multiple scores have to cross all of their cutoffs to get treated. One approach to deal with these cases is one-dimensional localization using a single score on the subpopulation with all the other scores already crossing the cutoffs (“conditional one-dimensional localization approach, CON”), which is, however, inconsistent when partial effects are present which occur when some, but not all, scores cross their cutoffs. Another approach is multi-dimensional localization explicitly allowing for partial effects, which is, however, less efficient than CON due to more localizations than in CON. We propose a minimum distance estimator that is at least as efficient as CON, yet consistent even when partial effects are present. A simulation study demonstrates these characteristics of the minimum distance estimator.

Key Words: regression discontinuity, multiple running variables, minimum distance estimator.

JEL Classification Codes: C14, C21.

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