

BIAS-AWARE INFERENCE IN FUZZY REGRESSION DISCONTINUITY DESIGNS

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Abstract

In this paper, we propose new confidence sets (CSs) for the regression discontinuity parameter in fuzzy designs. Our CSs are based on nonparametric local linear regression, and are bias-aware, in the sense that they take possible smoothing bias explicitly into account. Their construction shares similarities with that of Anderson-Rubin CSs in exactly identified instrumental variable models, and thereby avoids issues with “delta method” approximations that underlie most commonly used existing inference methods for fuzzy regression discontinuity analysis. Our CSs compare favorably in terms of both theoretical and practical performance to existing procedures in canonical settings with strong identification and a continuous running variable. However, due to their particular construction they are also valid under a wide range of empirically relevant conditions in which existing methods generally fail, such as setups with discrete running variables, donut designs, and weak identification.

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