

## Accepted Manuscript

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PII: S0304-4076(18)30114-3

DOI: <https://doi.org/10.1016/j.jeconom.2018.06.018>

Reference: ECONOM 4529

To appear in: *Journal of Econometrics*

Received date: 30 January 2017

Revised date: 2 January 2018

Accepted date: 27 June 2018

Please cite this article as: Xu K.-L., A semi-nonparametric estimator of regression discontinuity design with discrete duration outcomes. *Journal of Econometrics* (2018), <https://doi.org/10.1016/j.jeconom.2018.06.018>

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# A Semi-Nonparametric Estimator of Regression Discontinuity Design with Discrete Duration Outcomes\*

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June 28, 2018

## Abstract

We consider the regression discontinuity (RD) design with the duration outcome which has discrete support. The parameters of policy interest are treatment effects on unconditional (duration effect) and conditional (hazard effect) exiting probabilities for each discrete level. We propose a novel semi-nonparametric estimator which exploits a flexible separability structure of the underlying continuous-time duration process. Simultaneous inference over discrete levels is nonstandard since the asymptotic variance matrix is singular with unknown rank. The peculiarity is delivered by the nature of the RD estimand, and we provide solutions. Random censoring and competing risks can also be allowed in our framework.

*Keywords:* Generalized Wald test; grouped duration data; semi-nonparametric models; proportional hazard; regression discontinuity; series estimator; treatment effects.

*JEL classification:* C21; C25; C41.

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\*The author thanks Co-Editor, Associate Editor, three anonymous referees, Joshua Angrist, Marine Carrasco, Yingying Dong, Jean-Marie Dufour, Kirill Evdokimov, Han Hong, Ilze Kalnina, Vikas Mehrotra, Alice Nakamura, Joon Park, and participants at the Midwest Econometrics Group meeting at St. Louis, economics departments at Indiana, NC State, Université de Montréal, and University of Alberta School of Business for helpful discussions and comments. The author is also grateful to College of Liberal Arts at Texas A&M University for part of financial support under the Rothrock fellowship at an early stage of the project. The paper was previously circulated using the title "Estimation and Inference of Regression Discontinuity Design with Ordered or Discrete Duration Outcomes".

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