

Specification Tests for the Propensity Score

Pedro H. C. Sant'Anna*

Xiaojun Song[†]

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Abstract

This paper proposes new nonparametric diagnostic tools to assess the asymptotic validity of different treatment effects estimators that rely on the correct specification of the propensity score. We derive a particular restriction relating the propensity score distribution of treated and control groups, and develop specification tests based upon it. The resulting tests do not suffer from the “curse of dimensionality” when the vector of covariates is high-dimensional, are fully data-driven, do not require tuning parameters such as bandwidths, and are able to detect a broad class of local alternatives converging to the null at the parametric rate $n^{-1/2}$, with n the sample size. We show that the use of an orthogonal projection on the tangent space of nuisance parameters facilitates the simulation of critical values by means of a multiplier bootstrap procedure, and can lead to power gains. The finite sample performance of the tests is examined by means of a Monte Carlo experiment and an empirical application. Open-source software is available for implementing the proposed tests.

JEL: C12, C31, C35, C52.

Keywords: Empirical Processes; Integrated Moments; Multiplier Bootstrap; Projection; Treatment Effects.

*Department of Economics, Vanderbilt University, VU Station B #351819, 2301 Vanderbilt Place, Nashville, TN 37235-1819, USA. Email: pedro.h.santanna@vanderbilt.edu

[†]Department of Business Statistics and Econometrics, Guanghua School of Management and Center for Statistical Science, Peking University, Beijing, 100871, China. Email: sxj@gsm.pku.edu.cn