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Validity of Wild Bootstrap Inference with Clustered Errors

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Abstract

We study asymptotic inference based on cluster-robust variance estimators for regression models with clustered errors, focusing on the wild cluster bootstrap and the ordinary wild bootstrap. We state conditions under which both asymptotic and bootstrap tests and confidence intervals will be asymptotically valid. These conditions put limits on the rates at which the cluster sizes can increase as the number of clusters tends to infinity. To include power in the analysis, we allow the data to be generated under sequences of local alternatives. Simulation experiments illustrate the theoretical results and show that all methods can work poorly in certain cases.

Keywords: Clustered data, cluster-robust variance estimator, CRVE, inference, wild bootstrap, wild cluster bootstrap.

JEL Codes: C15, C21, C23.

1 Explanation

This paper was originally distributed as QED Working Paper No. 1383, dated June, 2017.

It has been replaced by a substantially revised version with a slightly different title, namely, “Asymptotic Theory and Wild Bootstrap Inference with Clustered Errors,” which is available as QED Working Paper No. 1399, dated March, 2018.

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