Comparing the Conley-Taber and the Standard Approaches to Inference in Difference-in-Difference Models Based on Small Policy Variation: The Case of TennCare.

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ABSTRACT

A 'weak instruments' type of problem arises in panel data models with little within variation. If there is insufficient policy variation (Conley and Taber 2011, hereafter CT), the difference-in-difference (or triple difference) estimator for the impact of the policy change will not have the standard normal asymptotic distribution and hence cannot be used for inference. CT propose an approach that produces consistent estimation of confidence intervals for the impact of the policy change.

We investigate whether this is an issue in the recent influential paper by Garthwaite, Gross and Notowidigdo (2014, hereafter GGN); while their analysis is based on data over eight years in 17 states, the only policy change occurs in Tennessee in 2005. To do this, we first investigate the sensitivity of the estimates across three different data sets for all of their models and for the models passing test of the çommon trends' assumption. We argue that their resutls are decidely not robust across data sets. Next, we consider whether their estimates (and their confidence intervals) are compatible with the finding by several studies that the introduction of the American Community Act had no discernable impact on the economy using power calculations that account for estimation error in their estimates. We conclude that their estimates are not compatible with the ACA impact estimates. We take this as evidence that the GGN results do suffer from the identification problem raised by CT; note that many other difference-in-difference estimates also use small policy changes and are likely to have the same problem.s

We then turn to the CT approach for obtaining consistent confidence intervals for the Tenn Care effect using our three different data sets. We find that the CT approach makes the confidence intervals more robust across data sets. In terms of our power calculations for the ACA impact, we find ...