**Assignment 4**

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1. Post the link to the repo “RDD”

**Answer:** <https://github.com/mateohenao01/RDD>

1. read Hansen’s paper in the /articles directory of the main class github entitled “Hansen AER”. **Briefly summarize this paper**. What is his research question? What data does he use? What is his research design, or “identification strategy”? What are his conclusions?

**Answer:** In United States and in the world, a big percent of the fatal traffic accidents is related with drunk driving, that is why the states have designed punishments determined by strict rules on blood alcohol content (BAC). By using the administrative record on drivers under the influenced blood alcohol content tests in the state of Washington from 1999 to 2011, the researchers estimates with a regression discontinuity design if having a BAC above the DUI (driving under the influenced) threshold reduces recidivism in drunk driving.

This paper offers evidence concerning the effectiveness of punishment and sanction in recidivism among drunk drivers, and found that having a BAC over the 0.08 legal limit decline the probability in repeat drunk driving over the next four years in 2 percent points, also having a BAC over the 0.15 (aggravated DUI) is associated with an additional 1 percentage point decrease in repeat drunk driving, this reduction in recidivism are explained principally by deterrence.

**Replication**

1. In the United States, an officer can arrest a driver if after giving them a blood alcohol content (BAC) test they learn the driver had a BAC of 0.08 or higher. We will only focus on the 0.08 BAC cutoff. We will be ignoring the 0.15 cutoff for all this analysis. Create a dummy equaling 1 if **bac1**>= 0.08 and 0 otherwise in your do file or R file.
2. The first thing to do in any RDD is look at the raw data and see if there is any evidence for manipulation (“sorting on the running variable”). If people were capable of manipulating their blood alcohol content (bac1), describe the test we would use to check for this. Now evaluate whether you see this in these data? Either recreate Figure 1 using the bac1 variable as your measure of blood alcohol content or use your own density test from software. Do you find evidence for sorting on the running variable?
3. The second thing we need to do is check for covariate balance. Recreate Table 2 Panel A but only white male, age and accident (acc) as dependent variables. Use your equation 1) for this. Are the covariates balanced at the cutoff? It’s okay if they are not exactly the same as Hansen’s.
4. Recreate Figure 2 panel A-D. You can use the -cmogram- command in Stata to do this. Fit both linear and quadratic with confidence intervals. Discuss what you find and compare it with Hansen’s paper.
5. Estimate equation (1) with recidivism (recid) as the outcome. This corresponds to Table 3 column 1, but since I am missing some of his variables, your sample size will be the entire dataset of 214,558. Nevertheless, replicate Table 3, column 1, Panels A and B. Note that these are local linear regressions and Panel A uses as its bandwidth 0.03 to 0.13. But Panel B has a narrower bandwidth of 0.055 to 0.105. Your table should have three columns and two A and B panels associated with the different bandwidths.:
   1. Column 1: control for the bac1 linearly
   2. Column 2: interact bac1 with cutoff linearly
   3. Column 3: interact bac1 with cutoff linearly and as a quadratic
   4. For all analysis, use heteroskedastic robust standard errors.
6. Recreate the top panel of Figure 3 according to the following rule:
   1. Fit linear fit using only observations with less than 0.15 bac on the bac1
   2. Fit quadratic fit using only observations with less than 0.15 bac on the bac1