Juan Pablo Bautista Zambrano

Assignment 4

Github repo and summary

1. New repository

Repository RDD: https://github.com/JPBautista15/RDD

2. Summary

Benjamin Hansen investigates the behavior of drivers who drive under the influence of alcohol in the United States. In the United States, drivers who drive drunk are punished according to the alcohol content in their blood. The main research question is, do BAC (Blood Alcohol Content) limits as currently administered reduce future drunk driving ?. What he wants to see is whether the severity of the punishment drunk drivers get (fines, license suspension, jail) influences the recidivism of driving again under the influence of alcohol.

The data he uses for research are 512,964 DUI (Driver Under Influence) BAC tests that were conducted in the state of Washington from 1995 to 2011. His strategy is to set BAC cuts at 0.08 for DUI and 0.15 for an aggravated DUI; these specific cuts allow the author to use a regression discontinuity design to test the effect of the punishments imposed at BAC thresholds on recidivism.

His results show that having a BAC above either the 0.08 DUI threshold or the 0.15 aggravated DUI is associated with reduced repeat drunk driving both in the short and long term. His estimates suggest that having a BAC over the 0.08 legal limit corresponds with a 2 percent point decline in repeat drunk driving over the next four years and having a BAC over the 0.15 enhanced punishment limit is associated with an additional 1 percentage point decline in repeat drunk driving.

Replication

3. Dummy creation: In Do file

4. Evidence for manipulation

To see if there is manipulation, we use the rddensity test. Rddensity package provides implementations of manipulation tests employing local polynomial density estimation methods.

```
     Cutoff c = .08 | Left of c   Right of c        Number of obs =       214558
                    |                                Model          = unrestricted
     Number of obs  |    23010       191548          BW method      =         comb
Eff. Number of obs  |     8895        13730          Kernel         =   triangular
    Order est. (p)  |        2            2          VCE method     =    jackknife
   Order bias (q)   |        3            3
       BW est. (h)  |    0.011        0.012
```

Running variable: bac1.

Method	T	P>|T|
Conventional	0.5337	0.5936
Robust	2.2032	0.0276

BAC Histogram
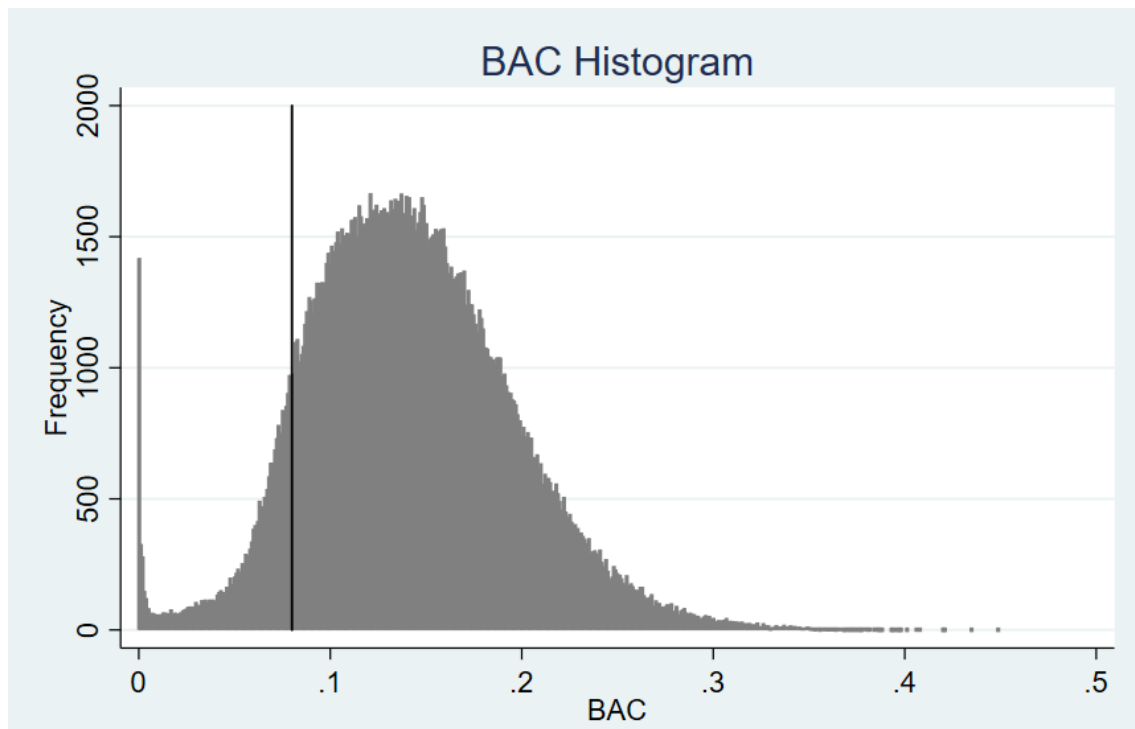
The results of the test suggest that if we use the bias-corrected version of the density test, there is statistical evidence of systematic manipulation of the running variable. If we use the conventional version of the density test, there is no statistical evidence of systematic manipulation of the running variable.

5. Covariate balance

VARIABLES	(1) male	(2) white	(3) aged	(4) acc
D	0.00451	0.0202***	-0.564***	0.0353***
	(0.00284)	(0.00241)	(0.0802)	(0.00247)
Constant	0.785***	0.844***	35.46***	0.116***
	(0.00269)	(0.00228)	(0.0758)	(0.00234)
Observations	214,558	214,558	214,558	214,558
R-squared	0.000	0.000	0.000	0.001

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The results suggest that factors such as white, aged or the presence of an accident are not balanced at the cutoff. The gender characteristic is stable. I think these results are related to the fact that according to the rddensity test there is manipulation.

6. Recreate figure 2
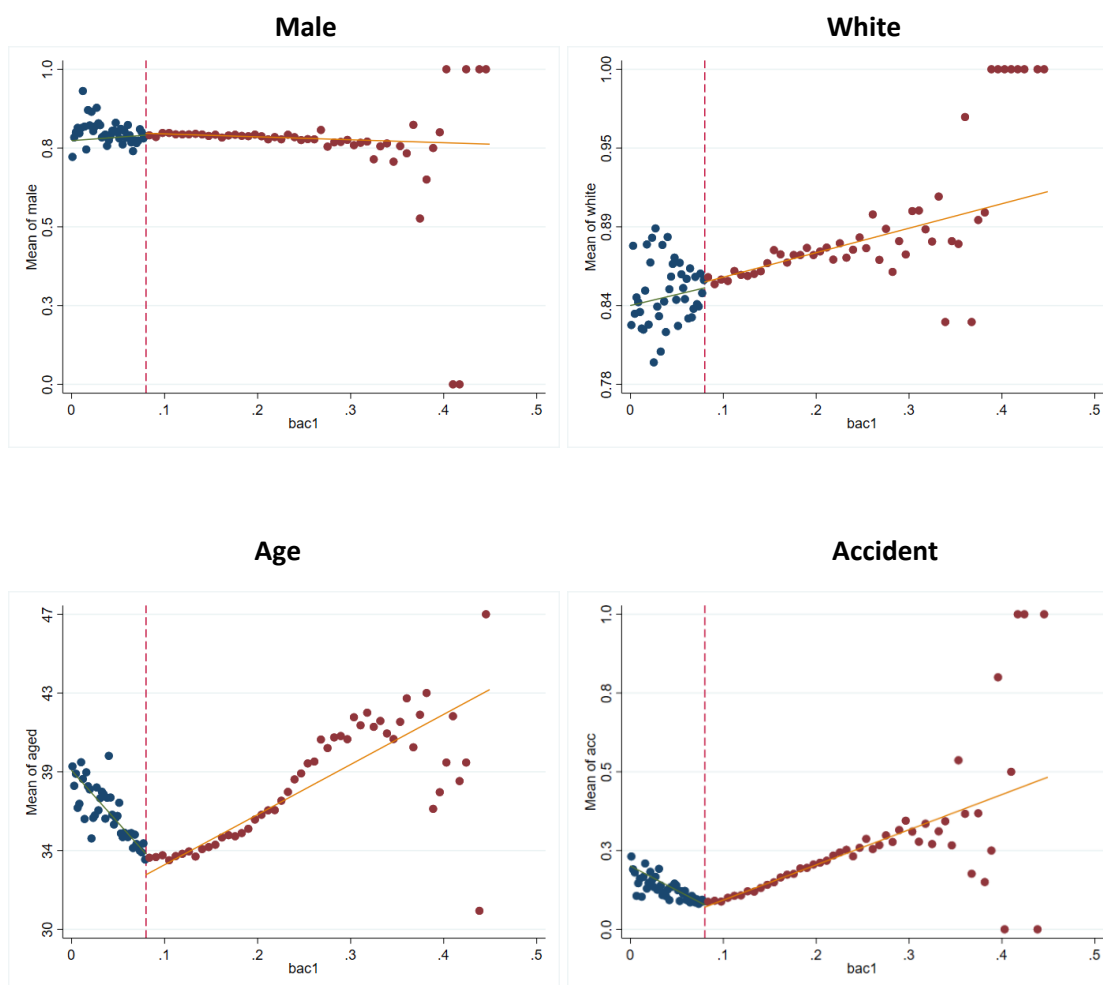
The graphs of white, age and accident are very similar to the graphs that the author has in his paper. The graph of male it's different.

7. Estimation of equation 1

The control variables are year, white, male, aged. Also, Reg 1 has as a control bac1, reg2 has as a controls bac1 and the interaction bac1*D and reg 3 has a controls bac1, and interaction bac1*D, bac2*D.

Panel A: Estimation with bandwidth of 0.03 to 0.13

VARIABLES	(1) reg1 recidivism	(2) reg2 recidivism	(3) reg3 recidivism
D	-0.0272***	-0.0582***	-0.0582***
	(0.00403)	(0.0152)	(0.0152)
Constant	5.450***	5.450***	5.430***
	(0.823)	(0.823)	(0.824)
Observations	89,967	89,967	89,967
Controls	YES	YES	YES
R-squared	0.004	0.004	0.004

Panel B: Estimation with bandwidth of 0.055 to 0.105

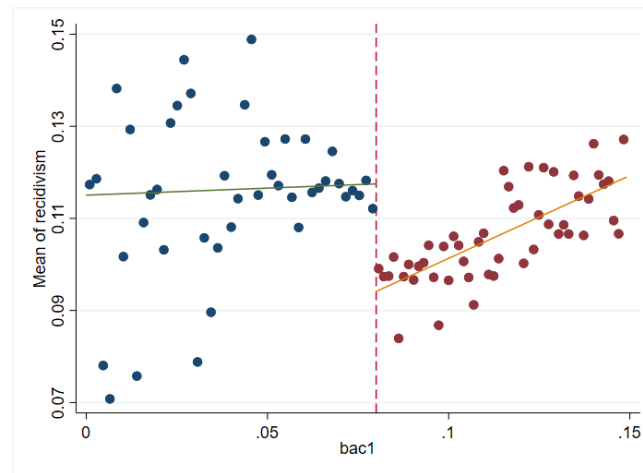| VARIABLES	(1) Reg1 recidivism	(2) Reg2 recidivism	(3) Reg3 recidivism
D	-0.0217***	-0.0632*	-0.0631*
	(0.00558)	(0.0350)	(0.0350)
Constant	6.093***	6.109***	6.140***
	(1.137)	(1.137)	(1.137)
Observations	46,957	46,957	46,957
Controls	YES	YES	YES
R-squared	0.005	0.005	0.005

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The results are significative and suggest that penalties decrease the probability that the driver will repeat the offense again. same results that the author finds in his research

8. Replicate figure 3 of paper

Linear fit

Quadratic fit