Zayd Abdalla1

Github Repository and Summary

1. https://github.com/zaabdall/RDD

2. The research question: What is the effect of harsher punishments and sanctions on curbing driving under the influence? Hansen had reviewed administrative records on 512964 DUI BAC tests from Washington courts from 1995 to 2011. He focused specifically on data between 1999 to 2007 since January 1st, 1999 marked Washington's decision to define a threshold of 0.08 for determining a DUI along with a threshold of 0.15 for an aggravated DUI. Hansen also studied data on recidivism within four years of an initial BAC test, observing drivers who were of the state's legal drinking age. The method used is a regression discontinuity design. This method tests the effect of the punishments imposed at BAC thresholds on future drunk driving. The conclusion he drew was that harsher punishments and sanctions tied to higher BAC limits are associated with reducing future drunk driving. Notably, having a BAC above the DUI or even Aggravated DUI thresholds is associated with short term and long-term reductions in recidivism. Specifically, these estimates then suggest that a BAC over the 0.08 threshold corresponds with a 2-percentage point decline in repeat offenses over the next four years. Similarly, having a BAC over the aggravated threshold is associated with an additional 1 percentage point decline in repeat offenses. Lastly, he calculated an elasticity which claims that a ten percent increase in sanctions and punishments is associated with a 2.3 percent decline in future drunk driving.

Reproducing somewhat Hansen's results but just follow directions

3. Create a dummy

N	214558
sum_w	214558
mean	.892756271
Var	.095742958
sd	.30942359
min	0
max	1
sum	191548

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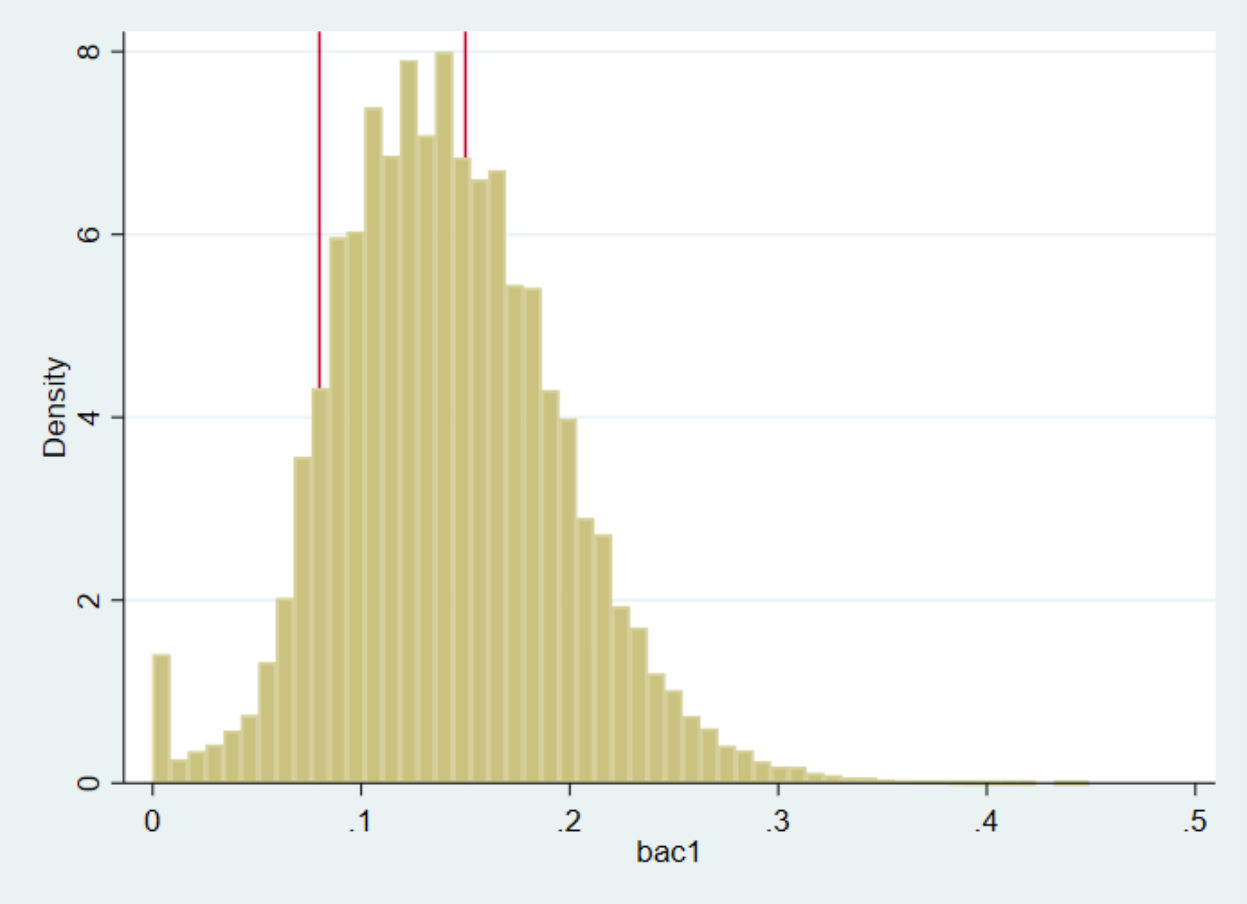
4. Evidence of manipulation



If individuals could manipulate their blood alcohol content, we could use a McCrary density test to check if that's happening. I don't find any evidence for sorting on the running variable and this is consistent with Hansen's results. Visually, this makes sense because there doesn't seem to be a discontinuity in the data around the cutoff point (i.e. there's no change in behavior due to the running variable).

5. Recreate Table 2 Panel A

The covariates are balanced at the cutoff. Had they not been, we would see very different values for the coefficients of the predetermined characteristics depending on DUI thresholds.

recidivism	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
white	.004316	.0020172	2.14	0.032	.0003623	.0082697
male	.0287562	.0017061	16.85	0.000	.0254122	.0321001
aged	-.0005139	.0000606	-8.48	0.000	-.0006327	-.0003951
acc	-.0016998	.0019644	-0.87	0.387	-.00555	.0021505
_cons	.1094245	.0030841	35.48	0.000	.1033799	.1154692

recidivism	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
white	.0043064	.0020176	2.13	0.033	.0003519	.0082608

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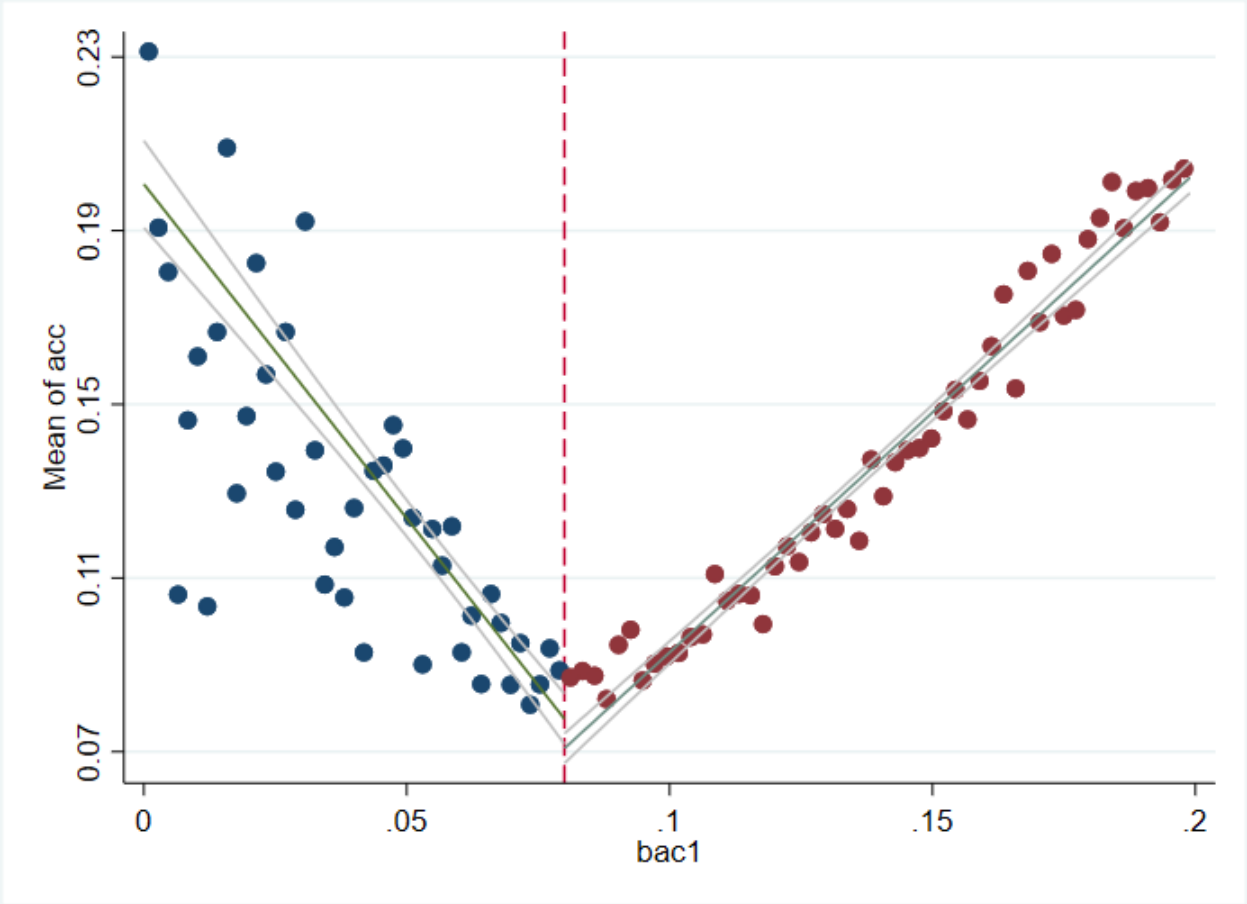
male	.0287541	.0017062	16.85	0.000	.0254101	.0320981
aged	-.0005136	.0000606	-8.47	0.000	-.0006324	-.0003948
acc	-.0017154	.0019654	-0.87	0.383	-.0055676	.0021368
arrest	.0005632	.0022478	0.25	0.802	-.0038425	.0049688
_cons	.1089244	.0036737	29.65	0.000	.1017241	.1161248

6. Recreate Figure 2 panel A-D



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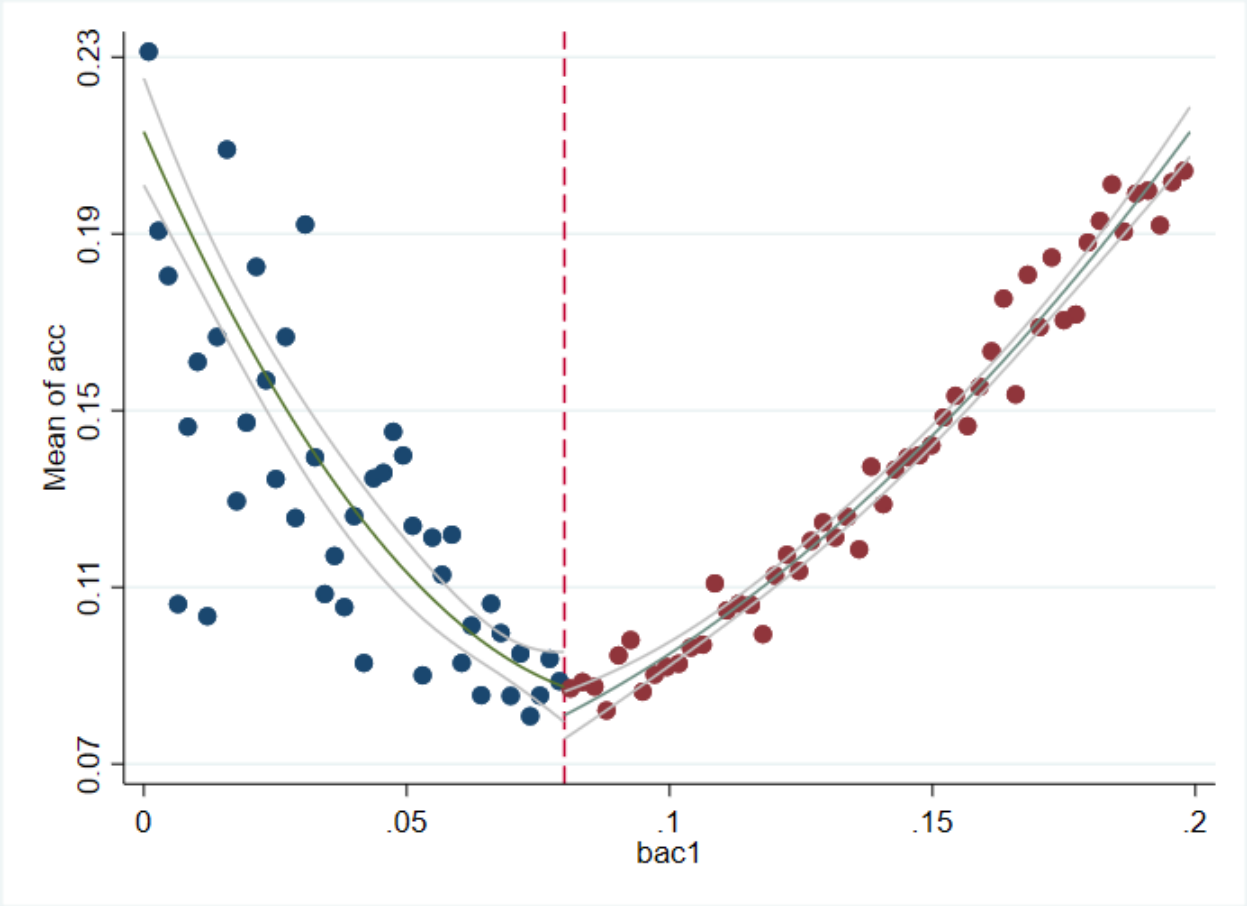

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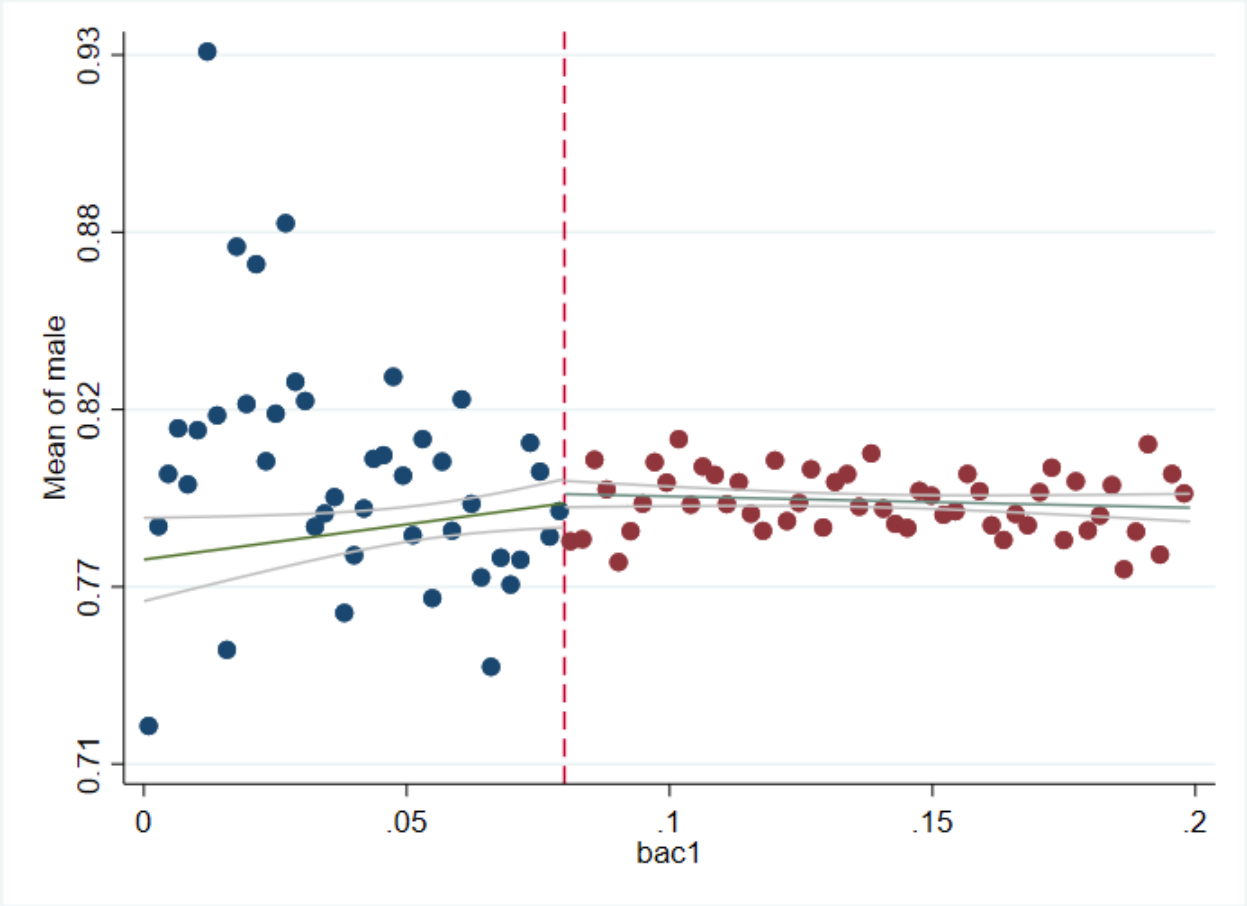

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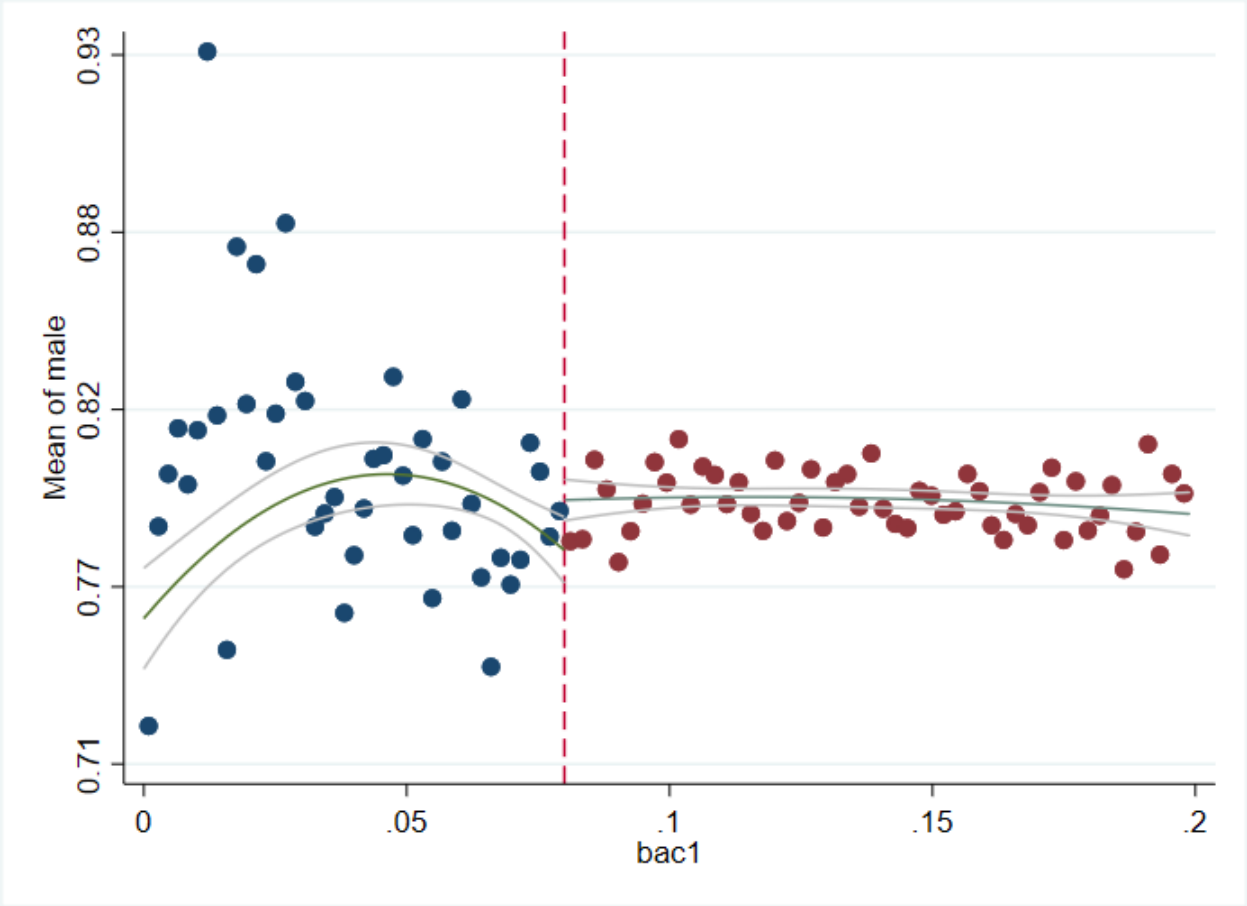

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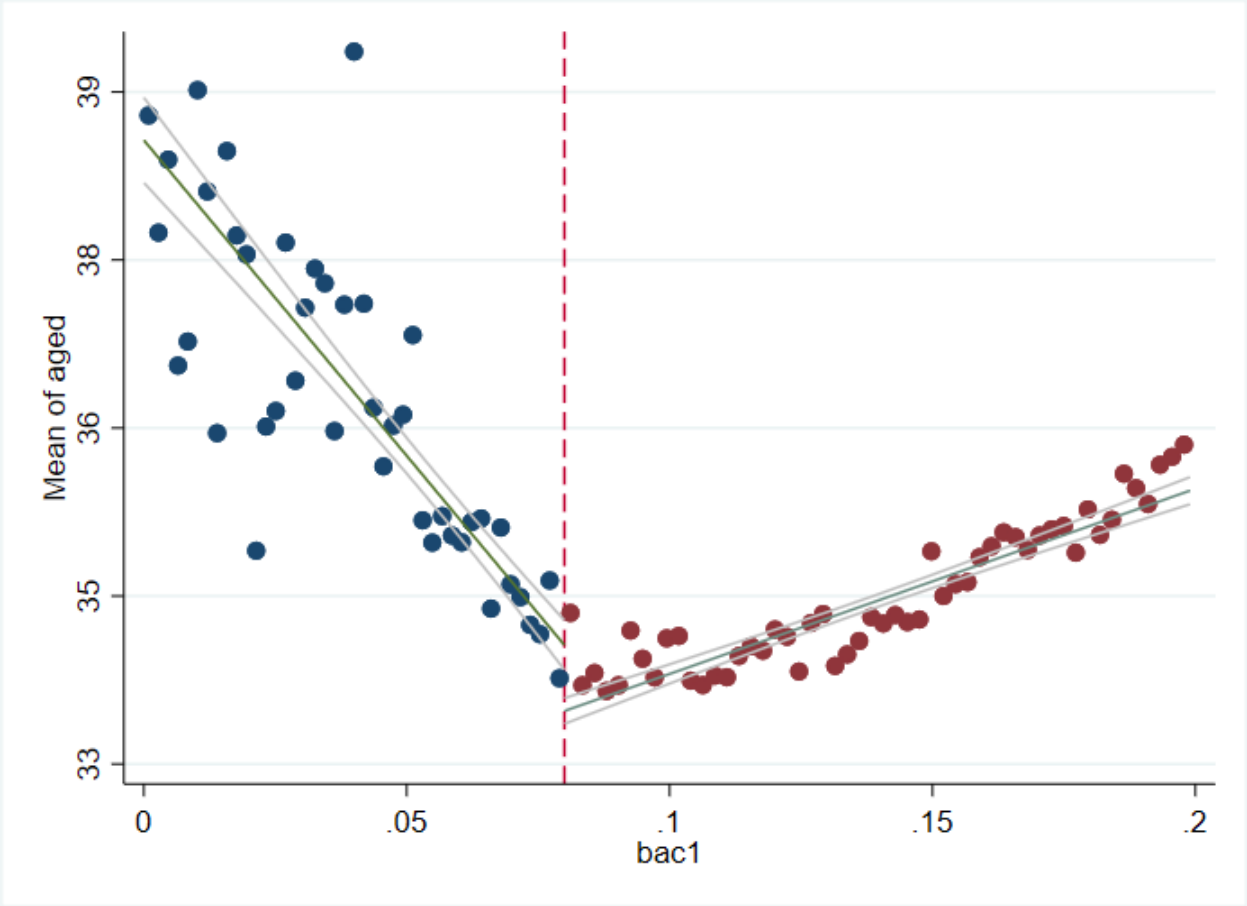

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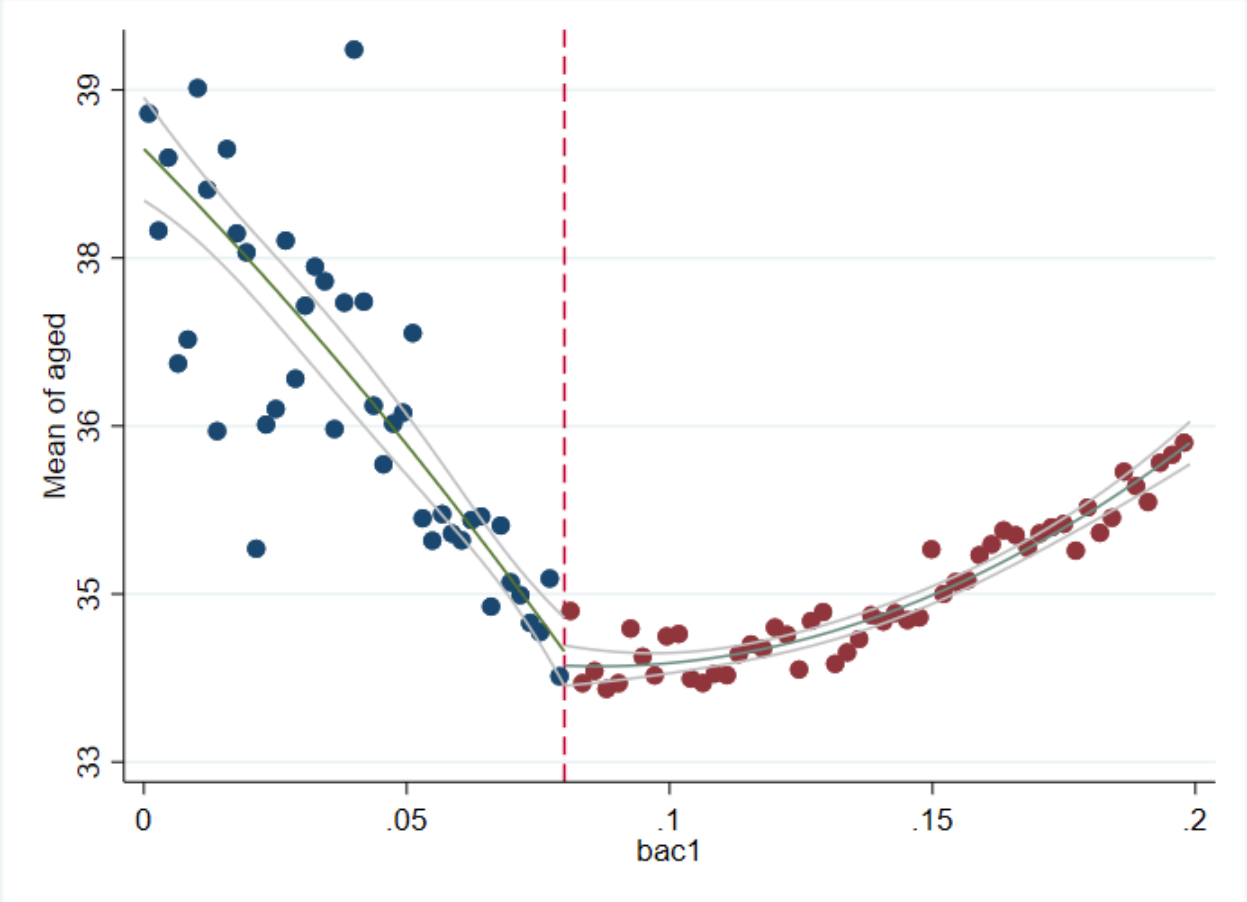

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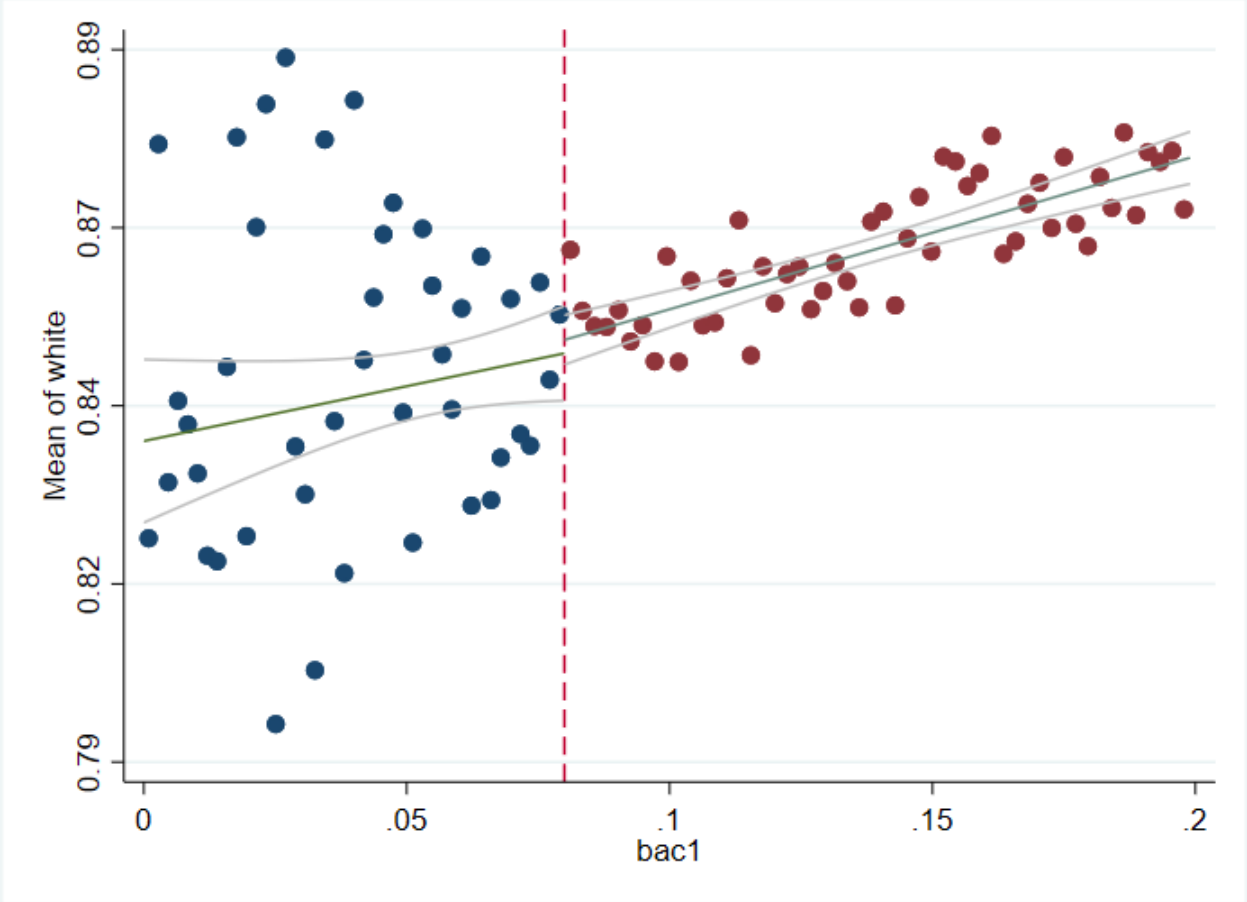

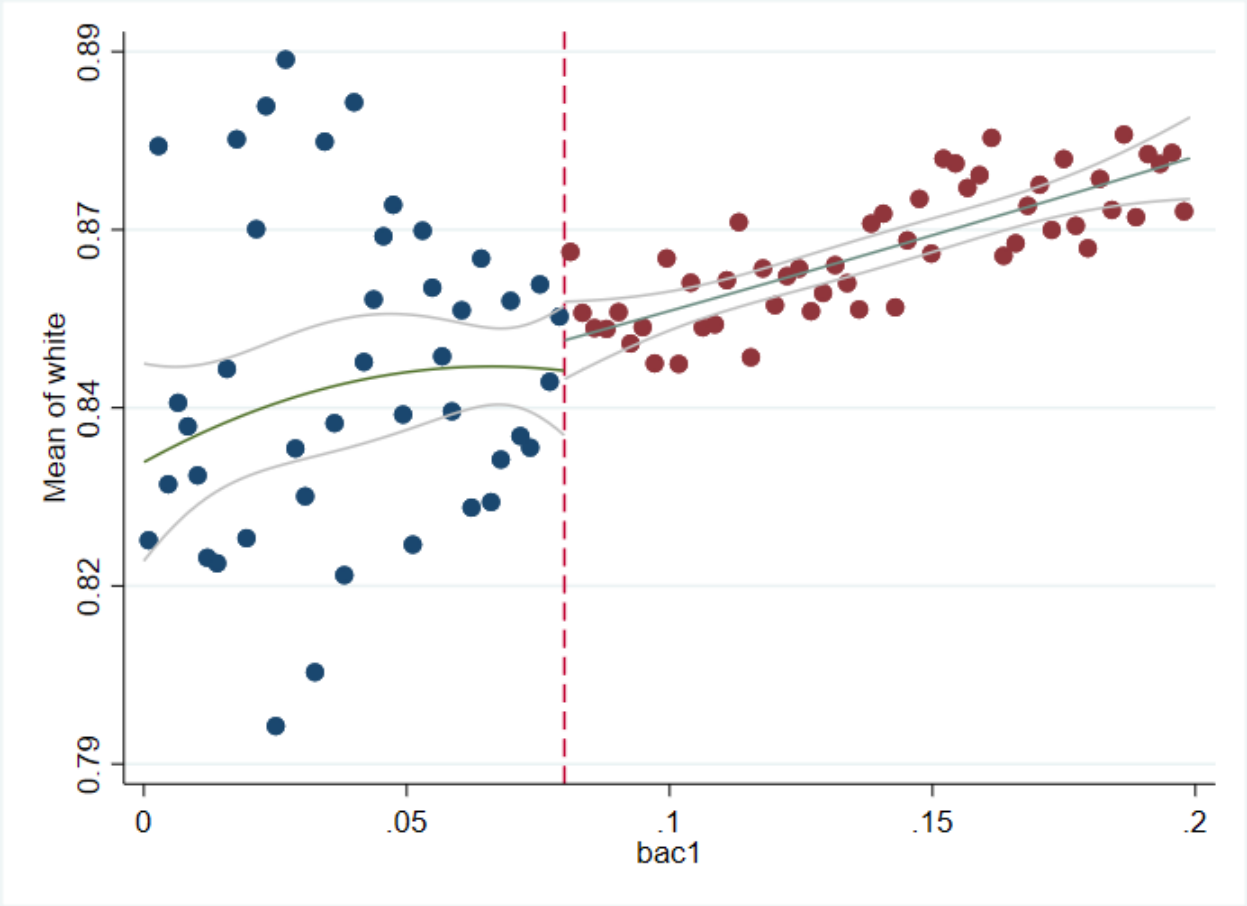

I attained fairly similar results to Hansen in that these demographic characteristics are stable across DUI thresholds. Otherwise, the regression lines ought to change based on the threshold which may potentially indicate some level of discrimination.

7. Replicate Table 3, column 1, Panels A and B (this didn't print out when exported)

estout linearly1 lcoff1 lcoffquad1

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	linearly1	lcoff1	lcoffquad1
	b	b	b
bac1	-.0545834		
_larrest_1	-.0236156		
bac1_c	.0058758	-.9996903	
_larrXbac1~1	.3915569		

0.arrest 0

1.arrest -.0143164

bac1_c2 -24.61442

0.arrest#c~c 0

1.arrest#c~c 1.01584

0.arrest#c~2 0

1.arrest#c~2 31.87052

_cons .1123115 .117067 .111337

. estout linearly2 lcoff2 lcoffquad2

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	linearly2	lcoff2	lcoffquad2
	b	b	b
bac1	-.4417888		
_larrest_1	-.0204502		
bac1_c	-.1503164	-.9843176	
_larrXbac1~1	.5233241		
0.arrest	0		
1.arrest	-.0145254		
bac1_c2	-38.12431		
0.arrest#c~c	0		
1.arrest#c~c	.6823098		
0.arrest#c~2	0		
1.arrest#c~2	63.41895		
_cons	.1433839	.1151668	.1124519

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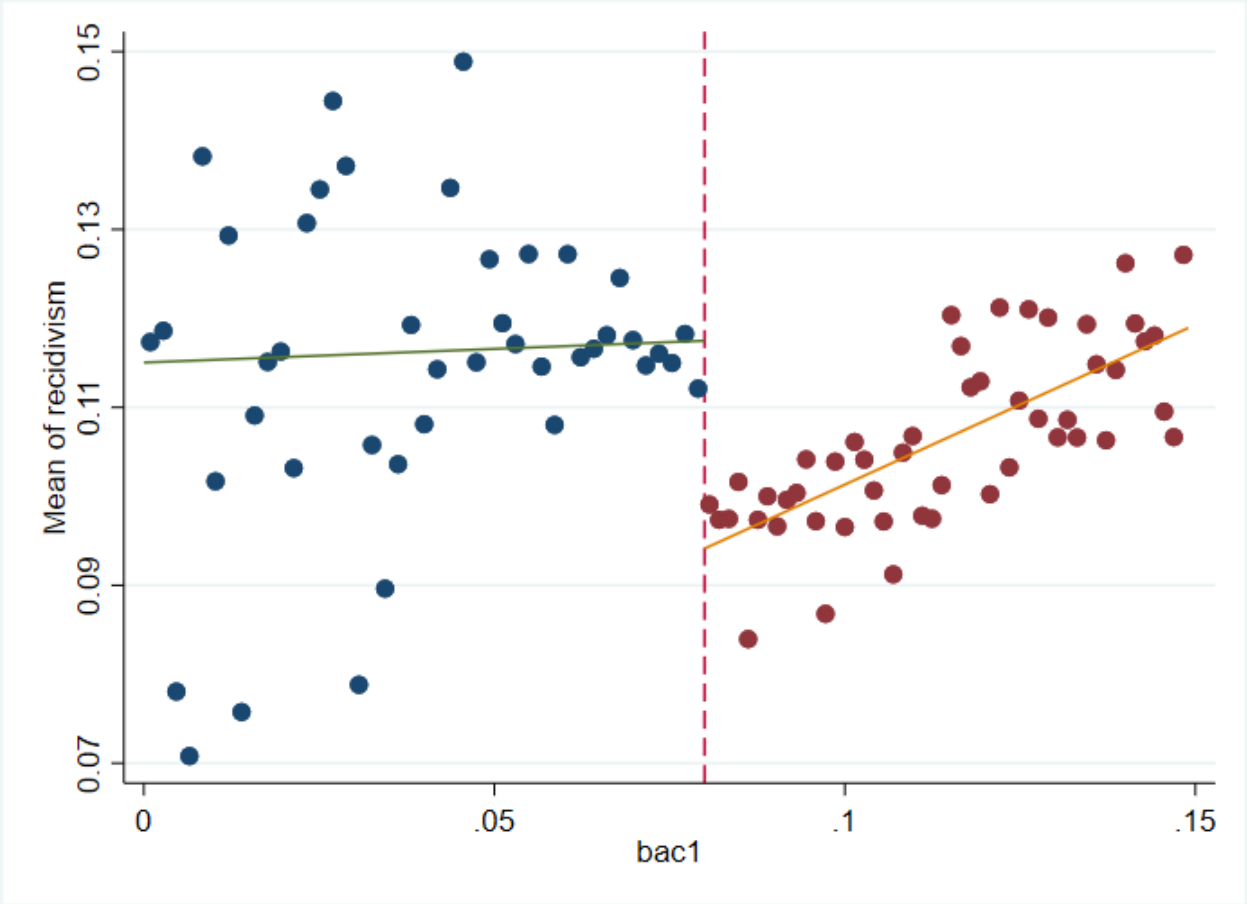
8. Recreate the top panel of Figure 3



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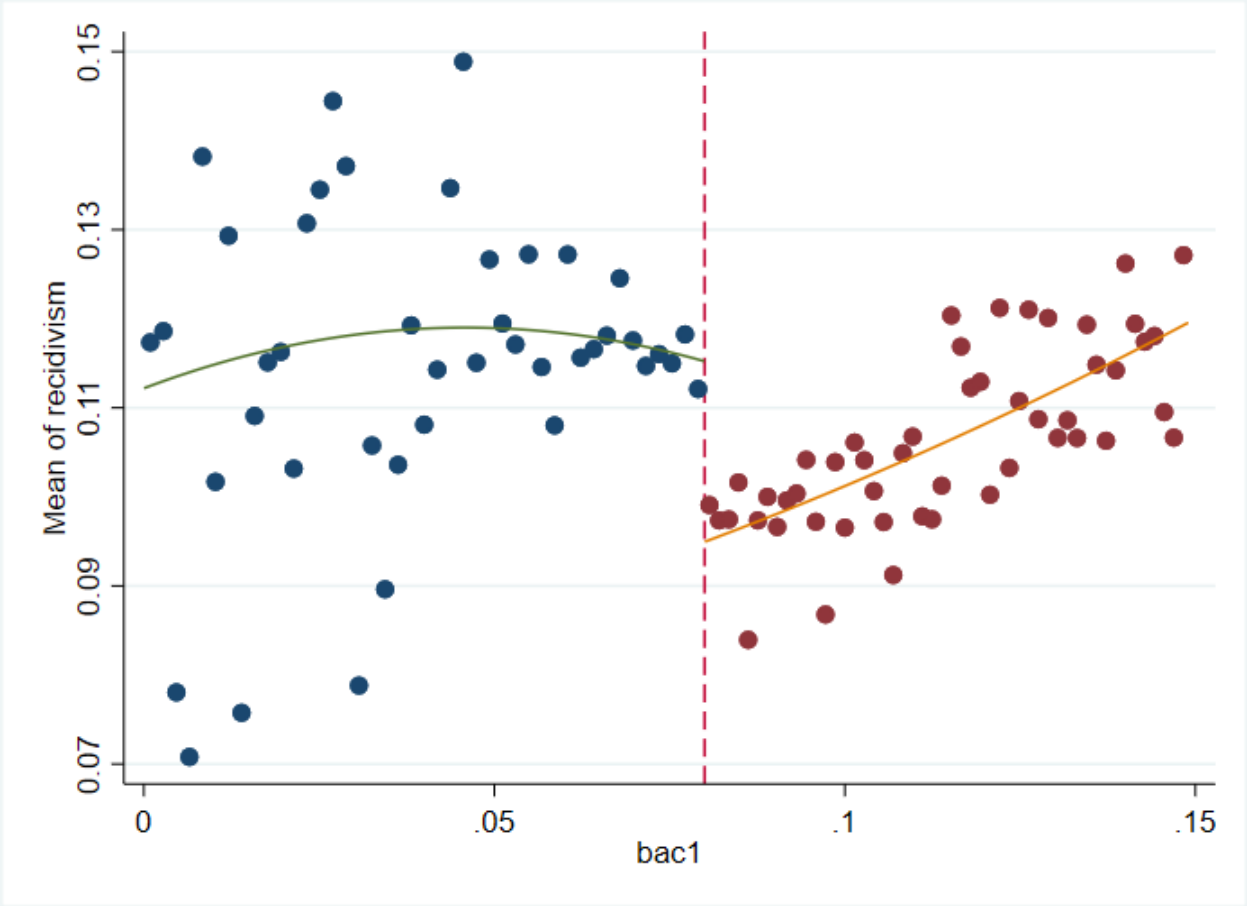

9. Discuss what you learned from this exercise. What was the hypothesis you tested and what did you find? How confident are you in Hansen's original conclusion? Why/why not)

I gained more practice with making figures/tables in Stata and learned more about RDD through doing this exercise. The hypothesis tested was if harsher punishments and sanctions are implemented, then these punishments and sanctions ought to curb driving under the influence. I feel confident in Hansen's original conclusion since there doesn't seem to be room for manipulation of the running variable BAC. Intuitively this makes sense since it would be difficult for one tending towards drunkenness to precisely manage their BAC levels—if that's even possible—and the elasticity of an increase in more severe punishment being associated with a reduction in recidivism gives me some comfort that their economic intuition on the relationship between tougher punishments and repeat offenses is supported.