PP346 Program Evaluation
Problem set 2. Due Date: Tuesday, Nov 13, 2018, by 9am, via Canvas.

For this assignment, provide a write-up where you answer the questions below, selectively cutting and pasting output where needed. Be concise in your write-up; excess wordiness will be penalized. Also, submit a log file that includes commands and results for your entire analysis. The assignment makes use of AganStarrQJEData.dta, which you can find on Canvas.

In this problem set we will reproduce some of Amanda Agan and Sonja Starr's basic results, so start by reading their paper *(Ban the box, criminal records, and racial discrimination: A field experiment)*, which you can find on Canvas.

Questions:

1. For this question, restrict your analysis to the set of job applications that asked about criminal records ("Box" applications) in the before period ("pre-BTB" period). (Note: there are some applications that did not have a box in the pre-BTB period, but then added them in the post-period. Agan and Star code these as "remover = -1" in their data and call them "reverse compliers." Exclude these observations from your analysis throughout this assignment.)
   a) What is the average callback rate for people who committed crimes? For those who didn't? Is the difference statistically significant?
   b) Can we interpret this as a causal effect? Explain briefly.

2. Now consider just the "Box" applications but include both the pre- and post-BTB periods.
   a) Regress callback rates on race, GED, and employment gap. Include "chain"[1] and "center" fixed effects. Does race appear to have an effect on callback rates? Does this coefficient have a causal interpretation?
   b) Estimate the model again, but without the chain and center fixed effects. Does the coefficient on "white" change? Why is it important to include chain and center fixed effects?
   c) Now add the "conviction" variable. What happens to the coefficient on "white"? If the coefficient changes, does this mean that the previous regression was subject to omitted variable bias?

3. The authors estimate the following model for different subsets of the data, where "Box" is an indicator for whether the application had a box asking about employment[2], and **X** is a vector of covariates:

$$Callback_{ij} = \alpha + \beta_1 Box_j + \beta_2 White_i + \beta_3 Box_j * White_i + X_i\,\gamma + \varepsilon_{ij}$$

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[1] The data includes a variable called "Chain ID with small Chains Grouped". Use this variable for your chain fixed effects throughout the assignment.
[2] Agan and Starr call this variable "crimbox".

a) Suppose they run this regression on the full sample, which includes both Box and non-Box applications, but only in the pre-period (don't actually do this yet). What do α, β_1, β_2, and β_3 tell you?

b) Do you think "Box" and "non-Box" stores might differ in systematic ways, besides their decision to include a box asking about criminal history? In other words, do we think this variable is "as-if" randomly assigned?

c) Suppose they run the regression on just the "Box" applications in both periods (again, don't do this yet). What is the interpretation of the coefficients now?

4. For the below estimations, include controls for employment gap and ged, as well as center fixed effects. Again, exclude the so-called "reverse compliers."

a) Estimate the model from question 3 on both "Box" and non-"Box" applications in just the pre-period.

b) What kind of standard errors should you use, and why?

c) Is the coefficient on "crimbox" statistically significant? What about "white" and the interaction of "crimbox" and "white"? Interpret these findings.

d) Now estimate the model from question 3 on just "Box" applications in both periods. Interpret the coefficients.

5. Based on the above analysis, what are your conclusions about the effects of BTB?