**Assignment #4**

A frequent critique of the US criminal justice system is that incarceration turns **one-time convicts** into **professional criminals**.

* After a young person receives a criminal conviction, he or she fails background checks for years. This makes employment in the normal economy harder to achieve, which makes crime more tempting.
* In addition, the convict may meet other criminals while in jail. These new relationships may further nudge the criminal into future criminal activity (for example, by teaching criminal skills or by recruiting the convict into future black market opportunities).

Harsh sentencing could thus be creating more criminals, which would clearly reduce the benefits of convictions and criminal sentences. President Obama referred to this as the "cycle of crime." On the other hand: Obama's theory may simply be a theory. In this assignment, you will work on a measurement strategy for assessing the "cycle of crime."

Questions:

1. What implicit claim about causality does Obama's "cycle of crime" theory assert?

***Response:***

The harsh sentencing/incarceration itself can cause convicts being more likely to commit future criminal activity.

1. Your friend has an ingenious idea. He/she has detailed case data about criminal sentencing in a large jurisdiction for everyone charged with a felony. The data includes the length of the prison sentence (in days), and whether the person was convicted of a *second* crime after he/she was out ("recidivism"). This seems to be what the "cycle of crime" theory is talking about.   
   The proposed research design is: Run a regression whose outcome is recidivism and whose main explanatory variable is the length of the prison sentence. React your friend's research design.

***Response:***

This design cannot used to examine “cycle of crime” theory.

What this theory really interested in is how incarceration itself can lead to recidivism. However, what this design is testing is how the length of the prison sentence influences the recidivism. The length of sentence is not a good proxy/operationalization of harsh sentencing. Also, there are many covariates/confounding factors that have been ignored in this design.

For example, the severity (objective) of the crime they committed. Specifically, those who intentionally kill/rape another may receive longer length of prison sentence than people with unintentionally misdemeanor. And the former group people are more likely to recidivate no matter how long they stay in prison.

Another example, people who get longer sentence if it is not their first crime so they may just replicate this pattern again in the future and thus this recidivism actually has nothing to do with the harshness of the punishment itself.

1. You will now develop a separate research design. You notice in the data contains names identifiers for judges. By merging in with a separate dataset, you are able to add a new variable representing whether each defendant's presiding judge was appointed by a Democrat or a Republican.   
     
   You also learn that judges in this jurisdiction (and in most) are randomly assigned to defendants.   
     
   These facts can be used in an instrumental variables (``IV'') design. However, you will need to put the pieces together about how exactly it would work. The data is [here](https://github.com/bocowgill-collaborations/ResearchMethods-Repository/tree/master/HW4). Please note:
   * This includes defendants charged with Class E felonies (the lowest kind) and misdemeanors only.
   * The data is only for defendants who went to trial.
   * You've been given simulation data, but there are several important papers that use this exact research approach on real data. For example:
     + [Distortion of Justice: How the Inability to Pay Bail Affects Case Outcomes](https://academic.oup.com/jleo/article/34/4/511/5100740)
     + [The Effects of Pretrial Detention on Conviction, Future Crime, and Employment: Evidence from Randomly Assigned Judges](https://www.aeaweb.org/articles?id=10.1257/aer.20161503)
2. Perform a balance test. Does the judge's party really seem to be randomly assigned?

***Response:***

Table 1. Test of Randomization

|  |  |  |  |
| --- | --- | --- | --- |
|  | Democracy | Republic | Difference |
| Crime Severity | 1.979 | 1.966 | 0.014 |

\* p<0.1, \*\* p<0.05, \*\*\* p<0.01

According to the balance table above, the party of the judge is supposed to be randomly assigned since crime severity did not differ significantly based on the party of the judge.

1. Describe in words the ``first stage'' of the IV design. Then, create a publication-quality table for the first stage only.
   * Find the variable you want to make a causal statement about. Let's call this ``x.''
   * Use this as the outcome of your first stage regression.
   * As the main explanatory variable, use your instrument (``z'').
   * Control for other variables that might explain x besides z (as long as they are not  downstream of z).

***Response:***

X -- months in jail *“Length of the Prison Sentence*”;

Y – recidivates “*Recidivism”*;

Z -- the party of the judge *“Judge’s Party”*

Control -- severity of the crime “*Crime Severity”*

Table 2. First-stage OLS

|  |  |
| --- | --- |
|  | Length of the Prison Sentence |
| Judge's Party | 3.2\*\*\* |
|  | (.37) |
| Crime Severity | 18\*\*\* |
|  | (.23) |
| Observations | 5000 |
| *R*2 | 0.565 |

1 Standard errors in parentheses

\* p<0.1, \*\* p<0.05, \*\*\* p<0.01

2For Judge’s party, 1=Republic, 0=Democratic

Your first stage regression will be

reg x z control1 control2 ... controln

1. Interpret the coefficient on your instrument from the first stage.

***Response:***

According to the coefficient on my first stage result, independent of severity of the crime they committed, the month amounts the same defendant got will be 3.2 times of the amount they would get if assigned to a democratic judge.

And such effect is significant.

1. Calculate the "reduced form." Your reduced form regression will be

reg outcome z control1 control2 ... controln

***Response:***

Table 3. Reduced form

|  |  |
| --- | --- |
|  | Recidivism |
| Judge's Party | .14\*\*\* |
|  | (.012) |
| Crime Severity | .19\*\*\* |
|  | (.0077) |
| Observations | 5000 |
| *R*2 | 0.128 |

Standard errors in parentheses

\* p<0.1, \*\* p<0.05, \*\*\* p<0.01

1. Calculate the ratio of the reduced form
   * The coefficient on z from the reduced form.
   * ... divided by ...
   * The coefficient on z from the first stage.

***Response:***

Increase in Recidivism from Judge’s Party\_\_\_\_\_\_\_\_\_\_\_\_\_

Ratio of reduced form= Increase in Length of Prison Sentence from Judge’s Party

\_\_\_\_\_\_\_\_\_\_0.14\_\_\_\_\_\_\_\_\_\_\_\_

= 3.2

= 4.375%

1. Now complete the IV regression and make a publication quality table of the second stage. Use the setup below.

ssc install ivreg2

ivreg2 y (x=z) control1 control2 ... controln

Note that the F-stat is reported in the above regression output.

***Response:***

Table 3. Second-stage OLS

|  |  |
| --- | --- |
|  | Recidivism |
| Length of the Prison Sentence | .044\*\*\* |
|  | (.0058) |
| Crime Severity | -.62\*\*\* |
|  | (.11) |
| Observations | 5000 |
| *R*2 | -0.944 |

Standard errors in parentheses

\* p<0.1, \*\* p<0.05, \*\*\* p<0.01

1. State the F-stat in your writeup. It does not need to go into your table (although, in an actual publication it would).

***Response:***

F (2, 4997) = 164.34

Prob > F = 0.0000

1. Compare your answer to question #8 (above) to the IV coefficient in #9.

***Response:***

The reduced form coefficient (approximately) equals to the IV coefficient in Second-stage OLS.

1. Complete these sentences.

***Response:***

* 1. In the research design above (using randomized judges), the **always-takers** are the defendants who are always put into jail no matter which political party the judge of the defendant belongs to.
  + The **never-takers** are the defendants who are always not put into jail no matter which political party the judge of the defendant belongs to.
  + The **compliers** are the defendants who are put into jail only if the judge of the defendant is republic.
  + The **defiers** are the defendants who are put into jail only if the judge of the defendant is democratic.

1. Comment on the monotonicity assumption and the possibility of "defiers" in this setting.

***Response:***

Monotonicity assumption implies there is no “defier”.

In this setting, generally speaking, democratic judges are more tolerant for the defendant. Yet it is possible that democratic judges and republic judges have some opposing view on some kinds/types of criminal (e.g., spit on a democratic congress member?), and democratic judges can be particularly harsh to such defendants such that they would definitely put them into jail while the republic judges won’t consider it as a big deal.

1. In your dataset, what types of defendants are compliers?

***Response:***

defendants who are put into jail only if the judge of the defendant is republic.

They would those whose severity of crime level is 1.

1. Does the cycle of crime hypothesis appear to be true for the compliers?

***Response:***

Yes, it is true for the compliers.