**Homework 4**

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**Question 1.**

Obama is assuming directionality by asserting that incarceration leads to higher tendency to commit crime.

**Question 2.**

The proposed research design is confounded. Here, the friend assumes exogeneity. However, there could be factors that cause both recidivism and length of sentence, such as the defendant’s tendency to commit serious crime. Any causal statements would be unwarranted in this case.

**Question 4.**

Based on the severity of crime, it seems that the judge’s party is randomly assigned. We are unable to make similar claims on other aspects, however, due to the lack of data.

**Table 1.** Balance table for instrumental variable

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Control | Treatment | Difference | P value |
| Severity.Of.Crime | 1.979 | 1.966 | 0.014 | 0.554 |
| Observations | 5000 |  |  |  |

**Question 5.**

In the first stage design, we regress the instrumental variable on the treatment variable, along with other control variables. In this step, our goal is to obtain examine the strength/magnitude of IV’s effect on treatment. The output from this step is presented in Table 2.

**Table 2.** Stage One regression: predicting months in jail using judge’s party controlling for the severity of crime

|  |  |
| --- | --- |
|  | Months.In.Jail |
| Republican.Judge | 3.2\*\*\* |
|  | (.37) |
| Severity.Of.Crime | 18\*\*\* |
|  | (.23) |
| Constant | -19\*\*\* |
|  | (.52) |
| Observations | 5000 |
| *R*2 | 0.565 |

Standard errors in parentheses

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

**Question 6.**

Controlling for the severity of crime, the average length of sentence is expected to be 3.2 higher on average when a Republican judge is appointed. This effect is significant.

**Question 7.**

**Table 3.** Reduced form regression: predicting recidivism using judge’s party controlling for the severity of crime

|  |  |
| --- | --- |
|  | Recidivates |
| Republican.Judge | .14\*\*\* |
|  | (.012) |
| Severity.Of.Crime | .19\*\*\* |
|  | (.0077) |
| Constant | -.11\*\*\* |
|  | (.018) |
| Observations | 5000 |
| *R*2 | 0.128 |

Standard errors in parentheses

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

**Question 8.**

0.14/3.2 = 0.044

**Question 9.**

**Table 4.** Second stage regression

|  |  |
| --- | --- |
|  | Recidivates |
| Months.In.Jail | .044\*\*\* |
|  | (.0058) |
| Severity.Of.Crime | -.62\*\*\* |
|  | (.11) |
| Constant | .75\*\*\* |
|  | (.11) |
| Observations | 5000 |
| *R*2 | -0.944 |

Standard errors in parentheses

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

**Question 10.**

F(2, 4997) = 164.34 , p < 0.0001. This value is above the traditional threshold

**Question 11.**

The coefficient from #8 is the same as #9

**Question 12.**

* The always takers are the cases where the judge would always imposing a lengthy sentence regardless of their party.
* The never takers are the cases where the judges who are always imposing a short sentence regardless of their party.
* The compliers are the cases where the judge would impose a sentence length that is consistent with their party value
* The defiers are the cases where the judge would impose a sentence length that is incommensurate with their party value

**Question 13.**

It is likely that we would have defiers in this case. There may be some particular crimes that the Democrats are more disapproval of than Republicans. These crimes may lead Democrat judges to impose longer sentences than Republicans.

**Question 14.**

Defendants who got assigned a shorter period of sentence by a Democrat judge and who got assigned a longer period of sentence by a Republican judge are the compliers

**Question 15.**

If we assume no defiers, then the cycle of crime hypothesis appears to be true for the compliers. The month of jail time positively contributes to recidivism