How the data of violent crimes is related to personal income in each state

Law

Introduction

In today’s news, police brutality andother horrendous crimes trump all other matters that could possibly elevate the nation’s mood. This is simply because bad news follows the psychological human nature of negativity bias and our tendency to stick with preexisting notions, which just so happen to be negative according to the Nobel Laureate Daniel Kahneman. With all these violent crimes seemingly at an increase, new stations are in need of an explanation for all that is happening. A local example happens to be from Channel 4 news in Cleveland, Ohio. The researchers at this news agency set out to “ get to the bottom” of who commits more crime, and in their search they discovered that it is not black people who commit more crime, but poor people from all races. Does this conclusion from Channel 4 news accurately model what is happening in the United States?

One way to check if poor people do, in fact, commit more crimes would be to take the average per person income from each state and compare that to the number of crimes per person in each state. If these two variables are related then it should be clear that the states with a lower average income would have more crime in a given year. If this relationship exists, it could benefit the United States government’s search to reduce crime by narrowing down the states eligible for the most federal funding that could be utilized for larger police forces where needed.

The Model

To test the relationship between the violent crimes committed per person and the personal income per state, a simple linear regression in the form of Y

= β0 + β1X. Considering this is only data from the year 2012, this is only a sample of all years, meaning the sample linear regression model used to estimate the beta parameters above will be ŷ = b0 + b1x, where ŷ is the dependent variable, the amount of violent crimes committed by state per citizen; b0 is the estimate of the intercept; and b1 is the slope coefficient of the independent variable, personal income average per state.

The null hypothesis is that there is no significant relationship between the number of violent crimes committed and the average personal income per state. If the null hypothesis were to be rejected, the alternative hypothesis would be accepted. The alternative hypothesis supports a relationship between the number of violent crimes committed per citizen and the average personal income per state. If the null hypothesis gets rejected, the alternative hypothesis will be accepted, which supports the existence of a relationship between the two variables. The slope should be negative, showing that as income by state increases, the amount of violent crimes committed per person decreases.

The data came from three sources that can be trusted. Data for the independent variable, personal income by state in the year 2012, was taken from the web address: https://bber. unm. edu/econ/us-pci. htm. Dividing the population of each state by their respective violent crimes committed derived the dependent variable, violent crimes per person. The data for the amount of violent crimes committed in each state in the United States in 2012, as well as the population per state was taken from the web address: www. fbi. gov/about-us/cjis/ucr/crime-in-the-u. s/2012/crime-in-the-u. s.-

2012/tables/5tabledataecpdf. I then checked the 2012 population per state using data from the website: www. governing. com/gov-data/state-census-population-migration-births-deaths-estimates. html. All of these websites appear to be owned by respectable establishments, allowing for full trust in the information published.

The Results

Step-by-step procedure for the hypothesis test:

Hypothesis test:

Ho: $\beta 1 = 0$

Ha: $\beta 1 \neq 0$

If the null hypothesis is rejected, then the alternative is accepted.

1. Level of significance: $\alpha = .05$
2. Test statistic: F-statistic with one degree of freedom in the numerator and n-2 degrees of freedom in the denominator, that is 50 -2 = 48 degrees of freedom in the denominator.
3. Decision Rule: Reject the null hypothesis if the calculated F-statistic is greater than 4. 04.
4. Collection of Data and Calculations: See ANOVA table in Appendices I
5. Decision: The null hypothesis cannot be rejected since the calculated F-Statistic, 0. 55, is smaller then the critical F-statistic, 4. 04.
6. Summary: There is not a statistically significant inverse relationship between the personal income by state and the number of violent crimes committed per state.

7. The p-value is 0. 09874, which suggest that there is only a small probability of committing a type-II error. A Type-II error is failing to reject the null hypothesis if it is false.

Summary

News stations need to provide more accurate data and conclusions to their listeners. Although it is a common thought that poverty is the cause of most crimes, it can be seen through statistical evidence that this is almost certainly not the case. The linear regression is very weak and clearly shows no relationship between the personal income by state and the violent crimes committed per person in these states.

Using this knowledge, it becomes apparent that another variable or variables is a more likely cause to violent crimes being committed. Police agencies can use this data to persuade people to withhold prejudice against the lower classes and stop blaming them for the crimes being committed in our society. A more in depth study looking at a multitude of variables will need to be conducted to narrow down the roots of crime.