Legalization of Medical Marijuana on the Crime Clearance Rate

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Abstract

The purpose of the legalization of medical marijuana in Washington (I-692) was to help patients with terminally ill or debilitating conditions. Medical marijuana's introduction to state policy and economy created a natural experiment that I use to observe its impacts beyond the medical community. One potential impact is police effectiveness for other crimes due to reallocation of police resources. This study utilizes UCR data from 1994 to 2004 to determine if such an impact exists. I test whether the null hypothesis, which suggests no correlation of the legalization of marijuana on the crime clearance rate, can be rejected. My results show no means of rejecting this hypothesis, implying that the legalization may not have had any influence on the police allocation of resources to violent or property crime.

Introduction

Many advocates for the legalization of marijuana assert that legalization reduces crime by causing reallocation of police resources towards non-marijuana crime. Skogan finds that resource allocation increases police effectiveness and efficiency, and Makin et al. corroborate this reallocative effect by observing a positive correlation for the legalization of recreational marijuana on the violent and property crime clearance rates in Washington and Colorado.[1][2] Trilling describes how this allocative effect impacts both recreational and medical marijuana; however, there is no economic research published that answers the question: how does the legalization of medical marijuana impact the crime clearance rate?[3] I answer this question with regards to Washington for property and violent crime.

Theory and Methodology

The data from this study was collected by the Uniform Crime Reporting Statistics (UCR). The specific data from the UCR was consolidated and simplified via ICPSR. The set used was made by Kaplan (2018), who aggregated the monthly and yearly data for the offenses known and clearances by arrest from 1960 to 2017 per state.[4] I use the monthly data from 1994 to 2004 for my treatment (Washington) and my two controls (Idaho and US average). A multiple group interrupted time-series model was used to see the effects of the legalization of medical marijuana on the crime clearance rate for Washington. I utilize the Interrupted-Time-Series Analysis (ITSA), proposed by Linden and Arbor.[5] The original model does not correct for seasonal variation. Since this is monthly time series data, there is a high chance of seasonal variation of which was confirmed in my initial regression. Because of this variation, I added seasonal dummy variables along with the time variables to increase the internal validity of the study. The adjusted regression equation is shown below.

$$Y_t = \beta_0 + \beta_1 T_t + \beta_2 X_t + \beta_3 X_t T_t + \beta_4 Z + \beta_5 Z T_t + \beta_6 Z X_t + \beta_7 Z X_t T_t + \beta_8 M_1 + \beta_9 M_2 + \dots \beta_{19} M_{12} + \varepsilon_t$$

Results

Table 1 and Table 2 show the coefficients for Idaho and US Average, controlled for seasonal variation. The R-squared using Idaho as the control is greater than that using the U.S. Average. Immediate Idaho legalization effect shows the immediate shift in crime clearances for Idaho at the intervention. Both are negative and significant. The Immediate WA effect shows the immediate shift in the crime clearances at the intervention. This coefficient represents the difference between the treatment and the control, accommodating for potential bias. The coefficient is small and positive and not significant for violent and property crime respectively. The Post-treatment Idaho slope and the Post-treatment WA effect are both positive but also insignificant.

Table 1. ITSA Results on Washington Crime Clearance Rates with Idaho as Control

	Violent Crime	Property Crime
Immediate Idaho Effect	-0.104** (0.000)	-0.045** (0.000)
Posttreatment Idaho Effect	-0.000 (0.377)	-0.000 (0.121)
Immediate WA Effect	0.007 (0.775)	0.154 (0.123)
Posttreatment WA Effect	0.001 (0.115)	0.000 (0.205)
R-squared	0.552	0.641

Table 2. ITSA Results on Washington Crime Clearance Rates with US Average as Control

	Violent Crime	Property Crime
Immediate US Average Effect	0.064** (0.000)	0.001** (0.097)
Posttreatment US Average Effect	-0.001** (0.007)	-0.001** (0.000)
Immediate WA Effect	0.018 (0.429)	0.021** (0.003)
Posttreatment WA Effect	0.002** (0.000)	0.000 (0.051)
R-squared	0.216	0.494

Note: The P-values are in parentheses, *p <.05 **p <.01

Figure 1 and Figure 2 show the violent and property clearance rate trends graphically. Prior to legalization, clearances for property crime decreased; whereas, those for violent crime remained relatively constant. For property crime, the immediate effect after the legalization showed a small upward shift in Washington, but the posttreatment effect showed a continuous decrease in the crime clearance. For violent crime, the crime clearance rate was generally steady for both Idaho and the Washington. After the intervention, the immediate effect a small upward shift in the crime clearance for Washington and Idaho approximately equally. The posttreatment effect showed a slight increase in the crime clearance rate for Washington; whereas there was a slight decrease in the crime clearance rate for Idaho.
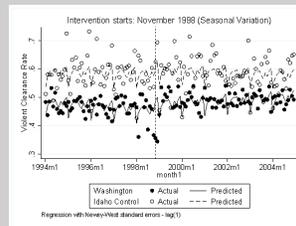

Figure 1. Monthly Violent Clearance Rate in Washington Controlled by Idaho (Seasonally Controlled)
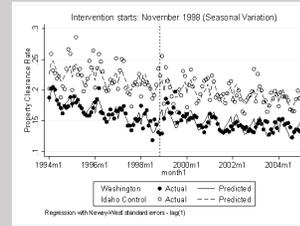

Figure 2. Monthly Property Clearance Rate in Washington Controlled by Idaho (Seasonally Controlled)

Discussion

The insignificant coefficients of Immediate WA and Posttreatment WA effect mean that, with this model, I cannot reject the hypothesis that the intervention had no immediate or long term effect on the change in the crime clearance rate. In order to ensure that the model accounts for autocorrelation, I use Baum and Schaffer (2013)'s actest, resulting in me specifying lag 1 to correct for any autocorrelation. Some limitations could have stemmed from the reporting of data of which some agencies omitted their findings for some years, causing their omission in my data. There is also the possibility that another government policy had a significant impact on the crime clearance between November of 1998 and December of 1998. Finally, if the data were present, the model could have been adapted to accommodate for more variables than time and seasonal variability. However, the other variables were only presented in yearly data of which there were not enough years to have a large enough sample.

Conclusion

My results show no significant findings of a deviation in the crime clearance rate for violent and property crime in Washington due to the legalization of medical marijuana. This can be because the legalization of medical marijuana only impacted a small demographic of marijuana consumers. Since it is still illegal for general consumption, the police still have to allocate the same number of resources. Assuming that the legalization of medical marijuana was the only big policy change during the intervention period, this research shows that an increase in police effectiveness for other crimes may not be a possible explanation for the reduction in crime.

References

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