

ECONOMIC IMPLICATIONS OF DECRIMINALIZATION

by

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## ABSTRACT

SHANYN L VIARS. The economic implications of decriminalizing marijuana in the United States. (Under the direction of Dr. CRAIG A. DEPKEN II)

Contrary to federal government policy in the United States toward illegal drug use, ten states enacted legislation to decriminalize marijuana during the 1970's. The *War on Drugs* campaign of the 1980's-1990's halted state marijuana reform policy until the 21<sup>st</sup> century. The *War on Drugs* reportedly cost the federal government approximately \$19 billion every year and has been accused of racial targeting and the disproportionate incarceration of poor and minority population (Jakubiec, Kilcer, and Sager, 2009). Decriminalizing minor drug infractions may offer new perspectives on policing communities and afford the criminal justice system the ability to redirect scarce resources to other activities. Beyond drug use policies, decriminalizing marijuana may offer other benefits including the ability to initiate industrial hemp farming, and encourage commercial production of hemp which can be used in more than 25,000 products (National Conference of State Legislatures, 2016).

Previous studies on the impacts of decriminalization are commonly derived from a theoretical perspective; a few economic studies focus on the effects of supply and demand. This paper reflects a broader focus, using empirical analysis to review the economic effects on states that enact decriminalization. The method allows control of unobservable variables, such as policy changes and the ability to compare state impacts over time. This paper seeks to examine the claims that decriminalization will reduce social cost and expenditures in law enforcement.

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## INTRODUCTION

Since 1973, 20 states have passed legislation in support of decriminalization including legalization for recreational and medicinal uses (National Conference of State Legislatures). The current trend reflects a change in public perspective beyond marijuana, coinciding with a “liberalization of public attitudes” (Ingraham, 2016), promoting a decentralized government with pressures on policy reform and global environmental concerns. During the 2016 Presidential election, Gallup polls reported by The Washington Post reveal that 60% of adults support marijuana legalization, compared to only 28% in the 1970’s (Ingraham, 2016). In the 1970’s state governments followed their own agenda choosing to enact decriminalization and despite federal directives. Researching the impacts on a state’s well being due to decriminalization in the 1970’s may assist us in determining the effects of current changes in marijuana reform.

Decriminalization policies allow a state to support its constituents in addressing at least two of these concerns: criminal justice reform and local sustainable industries. Opponents of decriminalization claim lenient policies on drugs will promote drug use, increase criminal behavior and disrupt society. Prior research on effects of marijuana use in society, correlate marijuana with addiction, typically perceived with use of hard drugs such as crack and heroin. This assumption toward marijuana is partially removed with the confirmation from medical science on the benefits to cancer patients, epileptic disorders and other medical conditions. Strong support for local industries and sustainable ecology prompted legislation to encourage hemp cultivation and new industry research.

This paper seeks to empirically explore how decriminalization affects state crime and finances and to help overcome suspicion that “economic perspectives on crime... [have] zero value” to policy makers (DiIulio, 1996). The method employed reflects a summary of theoretical results believed to affect a state’s financial well-being after decriminalization is enacted. Separate tests were conducted using a selection of dependent variables assumed to have impacts on states after decriminalization. The test is a comparison across states and time with the assumption that the variables will not be statically impacted by decriminalization. . This research seeks to address the assumptions outlined in previous literature and propose a method of analyzing policy reform that could be applied to studies on economic impacts on the recent trends of legalization and hemp industrialization when sufficient data become available.

## LITERATURE REVIEW

Before a review of past research is described, a clarification of the purpose of this paper is needed. The perspective of this research is neutral in regards to recreational use of marijuana, in that it is not considered an addictive drug and therefore assumes no additional cost in health expenditures related to drug abuse, counseling or rehabilitation services. The assumption views marijuana as an illegal agricultural commodity that could have potential economic effects similar to legalized drugs, such as alcohol and tobacco. In this comparable study, it is assumed that decriminalized states will not have marijuana arrests to measure as fines replace incarceration. The paper is not intended to address all social costs related to decriminalization or imply the same effects will occur under legalization. The research is conducted to address criticism and apply an economic method in measuring policy implications.

Previous studies on decriminalization are connected with marijuana use and effects of price elasticity of marijuana or effects on markets of other drugs with a focus on supply and demand: the number of drug users, prices, quantity or the quality of marijuana (Liccardo, 2003, Damrong, 2010).

In 1989, Eric Single published *The Impact of Marijuana Decriminalization: An Update*, which reviewed the policy reform measures enacted by states in the 1970's. Single reviewed studies and arrest data to research the impact of decriminalization. Single (1989) concluded that decriminalization had little impact on rates of marijuana use and savings in drug enforcement can be re-directed to other areas. Due to lack of data a comparable study between states that decriminalized could not be performed.



Miron (2002) examined the effects of decriminalization on Massachusetts' state budget and estimated \$29.5 million in savings to the criminal justice system. The author estimates decriminalization can produce savings through decreases in number of arrests, decreases in prosecutorial costs, and reduction in correction resources. Decriminalization is estimated to reduce drug arrests in Massachusetts by 1.9%, decreasing state expenses that result in substantial savings (Miron, *The Effect of Marijuana Decriminalization on the Budgets of Massachusetts Governments*). The number of persons incarcerated for marijuana possession in the state is minimal and therefore only minimal cost savings for state corrections may be obtained. Miron's example is limited to only one state and relies on simple accounting to estimate the savings where the percentage of marijuana arrests are multiplied by the criminal justice budget. . Also, the implications of decriminalization on a state's budget may stretch beyond the obvious impacts to criminal justice systems.

In 2010, Miron published *Budgetary Implications of Drug Prohibition* that concluded the total state net expenditures on prohibiting marijuana cost in 2008 was estimated at \$10.4 billion. Under legalization, the author estimates state would gain revenue from taxes comparable to those in alcohol and tobacco (Miron, 2010). This assumes regulation includes a "sin taxation" plus standard income/sale tax on marijuana that is estimated to increase revenue by \$6.4 billion (Miron, 2010, p. 17).

Weatherburn (2014) discusses costs and benefits to drug prohibition in Australia. Even though risk is associated with the purchase of illegal drugs, prohibition has little effect on an "individual's willingness to use", making it expensive in "human and financial" cost (Weatherburn). The author focuses primarily on the effects of market prices but signifies the "quantifiable" harms or benefits of drug policies are dependent on the type

of drug and the context of the policy. The complexity of uses for marijuana beyond recreational consumption could involve articulate discussions on alternatives to explicit prohibition.

Besci (1999) provided research with insight on modeling economics and crime outside of the supply and demand framework that provides insight to the relationship over time. The author finds the basic frameworks measuring crime are failed; incarceration reduces the supply of crime, decreasing the crime rate automatically. Crime responds to public efforts, therefore crime is positively correlated to benefits in unemployment, welfare and education. The author recommends panel data regressions can address policy implications by addressing state-specific variation in the model but some bias in simultaneous effects may still exist. Besci concluded that increased expenditures in policing may lead to a reduction in crime but only if arrests lead to incarceration. The above findings indicate effects of decriminalization should at least contribute savings in policing and enforcement.

## MOTIVATION AND THEORY

In order to review the implications of decriminalization on our economy, a description of marijuana, its uses and the history of its prohibition is discussed below.

What is Marijuana Exactly?

Marijuana or Cannabis is believed to have originated in Central Asia and be the oldest domesticated crop (Sides, 2015). Records of cultivation dating back to 28th century B.C. were found, as humans have consumed different varieties for industrial, medical, spiritual and even recreational purposes (Sides, 2015). Carl Linnaeus provided the taxonomic identification in 1753, and a medical report by William O'Shaughnessy in 1839 described "gunjah" as inducing an "inebriation of the most cheerful kind" (Ghose, 2015). The plant contains hundreds of compounds, including tetrahydrocannabinol (THC), to which scientists attribute the psychoactive effects of the plant that produce dopamine, or the "feel good chemical" (Ghose, 2015). There are many debates regarding the health effects of marijuana uses, with some experts claiming decreased IQ's, increased anxiety, and others focusing on benefits of preventing epileptic seizures and treating brain tumors (Single, 1989).

The marijuana debate recognizes the multitude of components to be explored; criminalizing the plant prevents further research on a crop that humans have accessed for thousands of years. Cannabis grown for industrial use is referred to as hemp, and the seeds and fibers from the plant have been used for centuries to produce beauty products, paper, fabric, and ropes (Ghose, 2015). In the early history of the United States, hemp farming was mandatory in Virginia, and The Declaration of Independence was drafted on hemp paper (Yonavjak, 2013). The production of hemp has evolved in manufacturing a variety of

products; health foods, organic products, clothing, construction materials, bio-fuels and plastics (Yonavjak, 2013). Hemp contains very low concentrations of THC and is typically grown taller and denser than marijuana that is grown for its budding flowers (National Conference of State Legislatures, 2016). In the U.S., hemp products have seen significant market growth, with retail sales exceeding \$500 million, yet major companies are forced to import hemp seeds, oil, and fibers for their products (Yonavjak, 2013). Decriminalization recognizes the shift in public perception toward marijuana and allows for research and cultivation that could induce new industries.

Marijuana is reportedly the most prevalently used illegal drug, with a third of the population over age 12 claiming to have tried marijuana (Miron, 2002). Therefore it should not come as a surprise that over half of the prison population in the United States during the 1990's were charged with drug law violations (Miron, 2002). Regardless of personal feelings toward marijuana use, a substantial amount of burden is created on resources and society that can be attributed to current drug policies. If small reforms in criminal justice produce insubstantial cost to states, why wouldn't a state consider decriminalization as a method to reduce unnecessary pressure on law enforcement? Expenditures directed toward prosecuting and incarcerating a large portion of the American population seems to be an inefficient use of scarce resources while demoting social growth. The study explores the possibilities of using decriminalization to redirect state expenditures or even induce new economic activity.

#### History of Decriminalization

In the 18th century, marijuana in the United States was legal although it is presumed

that recreational use was not widely accepted (Siff, 2014). The American government encouraged the cultivation of marijuana to increase the production of hemp used for items such as rope, ship sails, and clothing. Hemp was allowed as legal tender in the states of Virginia, Maryland, and Pennsylvania (PBS, 2016). After the Civil War, hemp production was replaced by imported materials, and by the 19th century, marijuana became popular as medicine and was sold openly in public pharmacies (PBS, 2016).

In the early 20th century, Mexican immigrants introduced the American culture to smoking marijuana in a tobacco leaf, prompting a stern reaction by state governments (Siff, 2014). After the Great Depression mass unemployment intensified resentment toward Mexican immigrants, who were blamed for the escalating deviant behavior associated with marijuana (PBS, 2016). Marijuana became linked to criminal behavior and violence, frightening 29 states into banning marijuana. In 1930, the Federal Bureau of Narcotics was established along with the Marijuana Tax Act which effectively criminalized marijuana (PBS, 2016).

During World War II, the Dept. of Agriculture introduced the “Hemp to Victory” campaign, a video that encouraged U.S. farmers to plant hemp in response to a scarcity of imports of Filipino hemp and Indian jute supplies cut off from Japan (Anderson, 2011). By 1956, the federal government continued to discourage marijuana use and introduced mandatory sentences for drug related crimes through the Narcotics Control Act, issuing 2-10 year sentences for marijuana possession (PBS, 2016). In 1973, President Nixon established the Drug Enforcement Agency (DEA), labeling marijuana a Schedule I drug, “dangerous substances with no valid medical purpose and a high potential for abuse” (Sides, 2015). The strict sentencing guidelines were continued through the 1980’s and 90’s

as “Anti-Drug Abuse” policies and “War on Drug” campaigns; both have been heavily criticized for the disproportionate incarceration of minorities, providing a false sense of security, and exponential cost to taxpayers with little results (Jakubiec, 2009). Adding criminal penalties to marijuana use was the government’s attempt to minimize health effects, social costs, avoid safety hazards, and adverse individual consequences (Single, 1989).

Despite the federal government’s anti-drug campaigns, marijuana use was widespread in the 1970’s, bringing a movement that urged policy reforms, instigating some states to decriminalize its possession (Single, 1989). Oregon was the first state to decriminalize marijuana possession in 1973, leading a trend of ten states enacting marijuana reform within five years. The trend has continued over the last 40 years, resulting in 23 states and the District of Columbia passing laws legalizing marijuana for medicinal or recreational uses (Governing Data, 2016). By 2015, the federal government acknowledged the importance of marijuana as a commodity with the passing of the Farm Bill (2014), which allows universities and state departments of agriculture to cultivate industrial hemp for limited purposes and which 30 states have adopted (National Conference of State Legislatures, 2016).

What is Decriminalization?

Decriminalization is not the same as legalization; decriminalization treats small amounts of possession of marijuana as a civil offense, resulting in a possible fine, versus a criminal offense, resulting in jail time. There is no consensus among states on how decriminalization is defined. Single defined it as “reducing penalties...rather than removing them altogether” (Single, 1989). Some states that have yet to enact marijuana reform have

mandatory minimum sentencing laws that force judges to punish possession, even in small amounts, with jail time (Slate Explainer, 2001).

Possession under decriminalization is usually defined as less than 1 ounce (current street value: \$300) but differs state to state (Slate Explainer, 2001). Larger amounts and trafficking would result in criminal offenses under decriminalization and federal laws on criminal possession of marijuana still apply. Single (1989) identified decriminalization as being “less radical than the name implies” yet opponents associate marijuana reform with increases in use and other criminal activity. Single found insignificant effects on the rate of marijuana use and no evidence of its impacts of influencing use of other drugs or being involved in criminal activity (Single, 1989). The factors linked to effects of decriminalization could also represent conditions under legalization, except the former defines marijuana users as criminals.

#### Implications of Decriminalization

Both the social and monetary cost associated with drug policies have been explored through a variety of studies offering various conclusions. Opponents of decriminalization argue that drug use increases potential harm to others and strains on public resources. Claims of drug users being self-destructive, contagious, and less productive with an increased exposure to premature death led to the control of addictive substances (Bretteville-Jensen, 2006). Supporters of decriminalization argue the costs to society and to individual users do not outweigh the benefits of drug prohibition policies (Bretteville-Jensen, 2006).

Miron and Zweibel (1995) suggest that prohibition of drugs merely glamorizes drugs and increases use, diminishing the implied effect of “respect for the law” (p. 176).

Thus, other claims related to marijuana use include increased violence and rise in property crimes. Opponents also argue that an increase in consumption of illegal drugs also increases the consumption of alcohol and tobacco (Miron and Zwiebel, 1995). Model (1993) reported that marijuana use increased, while other drug use decreased during decriminalization in the 1970's.

Single (1989) suggested that decriminalization provided cost savings related to enforcement and prosecution immediately after states decriminalized due to a decrease in marijuana possession arrests. For example, California reported a 36% decline in arrests and saved over \$12 million in costs related to enforcement during 1975-1976 (Single, 1989).



## PART I: DECRIMINALIZATION

This paper provides an empirical approach that measures economic differences between states that opted to decriminalize in the 1970's versus those that did not. The research seeks to expand on the work initiated by Single (1989) and other authors by exploring economic models to describe the effects within a state that endorses decriminalization. The test is administered to represent the casual effects of decriminalization using state data from 48 states (Hawaii & Alaska are excluded) from the years 1970-1980. The method illustrates effects in states that decriminalize, with minimal differences in states that keep current policies enacted.

### Data Description

The data obtained for the study are represented by variables that have been attributed to effects of decriminalization from previous research and represent areas subject to change after decriminalization was enacted in the state. The variables were partially selected based on cautions to economists on measuring crime by Besci (1999).

Previous studies focus in part on the assumption of increased drug use in decriminalized states through the measure of drug arrests (Single 1989; Miron 2002; Weatherburn 2014). Due to unavailability of concise data on drug arrests in each state during this time, the direct effect on intensity of use is not being measured. However, opponents claim that marijuana arrests will increase criminal activity is tested in variables representing crime rates. The following crime rate variables were obtained from the FBI's

Uniform Crime Reporting tool (UCR) and represent the number of reported offenses per 100,000 of the population: violent crime rate, property crime rate, murder/forcible homicide rate, and larceny rate.

The state's economic conditions are captured by personal income per capita as a measure of the state's "well being" (Becsi, 1999). Agriculture activity is measured by the state's farm output index and implies the ability to induce hemp farming as a new industry. The sectors of the state's budget directly linked to decriminalization are expenditures on the states corrections department, police protection, and public safety expenditures. Additional state expenditures were added that are consistent with "disincentives to crime": welfare, which represents the states "propensity" to help the disadvantaged, education which might "increase the opportunity cost of crime"; and higher education, which allows us to examine if effects of expenditures on college education are particularly unique.

To represent the assumption that marijuana use is related to use of other drugs, a measure of state revenue on two legal drugs can be used to compare links to increases with marijuana use. The tax revenue received by states for alcohol and tobacco sales can represent future state earnings on marijuana sales if taxation or licensing replaced criminal reform. State expenditures and revenue variables were obtained from the Census Bureau State Finances, Tax Collections. An additional variable included in the model is the state's population obtained from the FBI's UCR, due to the crime rates being specified by this reported population. The FBI's estimates for population were confirmed against the data from the Census Bureau.

## Methodology & Model

Single (1989) recommends using panel data regressions to assess policy implications as the model addresses state specific variations. A panel regression is utilized to represent the cross-sectional data over time, and limit the bias created by time aggregation. Panel data allows a before and after comparison while holding constant the unobserved factors that differ between states but do not change over time (Stock, Watson, 2007). The panel data represents the 48 different states from 1970-1980, during this time period, 10 states decriminalized marijuana (NORML). The following table (1) displays the decriminalized state and the year the policy was enacted:

**Table 1: Year State Decriminalized**

State	Decriminalization
Oregon*	1973
Colorado*	1975
Ohio	1975
California	1976
Maine	1976
Minnesota	1976
Mississippi	1977
New York	1977
North Carolina	1977
Nebraska	1979

\*Oregon and Colorado legalized marijuana in 2012 & 2014, respectively

The 10 decriminalized states above will represent Group A, as enacting a decriminalization policy; Group B will be identified as the remaining 38 states that did not change their policy regarding marijuana.

One difficulty in measuring the effects of policy implication is in controlling for unobserved factors that influence variables and change over time. A difference in difference estimate (DD) approach is used to capture and reflect differences in

decriminalization states versus other states within the sample period. The model implies that a group of participants are exposed to a “treatment” and compared to a control group that does not undergo any treatments (Imbens & Wooldridge, 2007).

The model reflects the difference in the tested variable in decriminalized states (Group A) compared with the difference in the tested variable in states that chose not to reform their policy (Group B). The underlying assumption of the model is that the trends between the two groups are equal in absence of treatment (Pischke). The model is estimated using the fixed effects method (OLS) to measure effects within groups and assumes time invariant characteristics that are unique to states are not correlated with other characteristics (Torres-Reyna). Thus, any changes in the dependent variables are not biased due to omitting time-invariant characteristics such as race, culture, or religious differences.

The Difference in Difference model is represented as:

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$$y_{it} = \beta_0 + \beta_1(\mathit{law}_{it}) + \beta_2(\mathit{post}_{it}) + \delta_1(\mathit{law} * \mathit{post}_{it}) + \alpha_i + \epsilon_{it},$$

$y_{it}$  = average change in dependent variable during time period

$\mathit{law}_{it}$  = 1 if state decriminalized during sample period, 0 otherwise

$\mathit{post}_{it}$  = 1 if year decriminalized or after, 0 otherwise (years before)

$\delta_i$  = difference in difference estimator

$\alpha_t$  = state fixed effect

$\epsilon_{it}$  = error term

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The model includes an observation for each state (i) and for each year (t) in the sample period. The variable  $y_{it}$  represents the dependent variable measured in the test for state (i) in period (t),  $\mathit{law}$  equals 1 if the state was ever decriminalized, and zero

otherwise, *post* equals 1 if the state was decriminalized in that year and subsequent years after decriminalization and zero otherwise. State populations were used to transform economic variables into per capita terms in Equation (2) to control for heteroskedasticity in the regression (Greene).

The parameters in this regression reflect differences between decriminalized states and other states during the sample period ( $\beta_1$ ), the differences between the states in the years after decriminalization occurred ( $\beta_2$ ), and the differences in the trend over time ( $\delta_1$ ). Below is an example of the mathematical procedure behind the difference in difference estimator.

Table 2: Difference in Difference			
	Before Change	After Change	Difference
Group A (treat)	$Y_{t1}$	$Y_{t2}$	$\Delta Y_t = Y_{t2} - Y_{t1}$
Group B (control)	$Y_{c1}$	$Y_{c2}$	$\Delta Y_c = Y_{c2} - Y_{c1}$
Difference			$\Delta\Delta Y = \Delta Y_t - \Delta Y_c$

A parameter is included in the model to measure the unobserved state effects ( $\alpha_i$ ) of fixed effects. The variables in the regression were transformed using logarithmic transformation to reduce outliers in the data and simplify interpretations, thus the dependent variable is represented as a percentage change.

Due to the fixed effects assumptions in panel regressions, using the difference in difference approach to measure changes to a singular state will result in statistically insignificant results. Therefore, Oregon's decriminalization in 1973 is reported as policy change in 1975 with Colorado and Ohio. The change reflects the correct assumptions of the difference in difference model where outcomes are observed for two groups over time and merely implies increased intensity in policy change toward decriminalization. Then

the first test represents the difference in selected variables of 3 states enacting decriminalization in 1975 versus the states that did not change their policy. A test was conducted for every year a group of states enacted decriminalization. The model will also include any states that decriminalized in prior time periods as a measure of the intensity of the effect of the policy. The models created for this study test the following scenarios:

1. Difference on dependent variable triggered by 3 decriminalized states in 1975  
(OR, CO, OH)
2. Difference on dependent variable triggered by 6 decriminalized states in 1976.  
(CA, ME, MN, OR, CO, OH)
3. Difference on dependent variable triggered by 9 decriminalized states in 1977  
(NE, MS, NY, NC, CA, ME, MN, OR, CO, OH)
4. Difference on dependent variable triggered by 10 decriminalized states in 1979  
(NE, MS, NY, NC, CA, ME, MN, OR, CO, OH)

The fixed effects model assumes strict endogeneity which can be violated if the policy changes in reaction to past variables. To reduce bias caused from heteroskedasticity and autocorrelation, White's robust regression was implemented (Imbens and Woolridge, 2007). The models in this research were tested using STATA®14.

## Analysis

Overall, the model produced mostly insignificant results in coefficients representing the difference between states before and after decriminalization was enacted. The model selected samples from 528 observations across states and time periods. Although decriminalization will not eliminate all social costs, it does not appear to affect other criminal behavior negatively. Property crime, murder/homicide rates, and larceny rates are not significantly different among states after decriminalization was enacted. In 1979, after 10 states decriminalized a negative significant difference on violent crime of 9% (.0410)\*, (per population of 100,000) was reported. These effects were not significant in other years, indicating there may be some endogeneity in the model or the intensity of decriminalization over the years led to the negative difference. During the 1970's decriminalized states had a slightly higher mean value of violent crime (20%), that later followed the trend of all states. The difference in means can be attributed to the inclusion of both New York and California in Group A; both potentially have higher crime rates than in other states.

Decriminalization produced no significant differences in personal income across states during the 1970's, so the findings represent no dissimilarities in the well being of a state that enacted the reform. The policy change also did not find significant differences in agriculture, indicating decriminalization was irrelevant in hemp cultivation during this time. In 2007, the Canadian government exported 59% of their hemp products to the only a portion of revenue the United States could save by encouraging hemp cultivation United States, valued at over \$3.4 million Canadian dollars (\$2.5 US), which represents

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(\*Note: standard errors reported in parenthesis / statistically significant at  $p < 0.05$ )

only a portion of revenue the United States could save by encouraging hemp cultivation and the innovative techniques this specific industry has produced. (Agriculture and Agri-Food Canada). With the passage of the Hemp Industrialization Act (2014), states could include regulation for hemp agriculture as part of criminal justice reform policy on marijuana to spur growth in new industries. As of 2016, hemp cultivation is allowed in 30 states, including the 10 in this study; states are either active in commercial hemp production or restrict cultivation to research only (National Conference of State Legislatures).

No significant differences in state expenditures on public welfare or education address the argument that decriminalization will produce self destructive, unenthusiastic drug users. Specifically, state expenses in higher education are not significantly different between states after decriminalization. The indifference suggests public wealth was not affected as state investment in education and welfare expenditures remained the same within the sample. The negligible difference indicates that more relaxed policies on marijuana use will not produce additional costs to society or impede resources being directed to long term economic growth.

Single (1989) described minor differences in variables related to enforcement and prosecution immediately after the policy was enacted. The results in this study display a negative difference in state expenditures for *police protection* between the two groups after decriminalization in 1975 and 1976 indicated in Table 3. The decriminalized states (OR, CO, OH, CA, ME, MN) experienced a 15%-20% (.0670, .0721)\* difference in police protection reported expenses per capita. The estimates are statistically significant at

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(\*Note: standard errors reported in parenthesis)



the 1% and 5% level, respectively. The r-squared estimates reported for this model explains nearly 90% of the variation ( $R^2 = .892 / R^2 = .896$ ). State police protection expenditures slightly increased after decriminalization in all states, with initial higher per capita cost in decriminalized states. The difference became insignificant in the subsequent years, indicating states possibly re-distributed resources. The estimates on state public safety expenses during this same period are significant revealing differences in cost of 10%-12% (.0372, .0259)\* per person; by 1977 the difference was insignificant as expenditures in policing decreased in those states that enacted decriminalization. The p-values reflect the level of significance at less than 0.01 and 0.001 respectively. The r-squared in the model explained almost 90% of the variation ( $R^2 = .892 / R^2 = .896$ ).

The results further supports the idea that re-distribution of resources by state governments is possible through decriminalization as savings in police protection and as public safety expenditures may have been allocated to other areas as these costs became insignificantly different from other states. State expenditures for corrections exhibited a slight negative difference of 15% (.0699)\* per capita in 1976 but is not significant in any other period. The model reported an overall decrease among states in correction expenditures per capita, suggesting decriminalization does not affect changes in incarceration expenses or possibly the savings were used for rehabilitation or vocational services for offenders. The results are not surprising as decriminalization would not affect individuals on parole, probation or under other state supervision. The results on expenditures to deter crime indicate criminal justice would need to explore innovative methods beyond decriminalization policies to decrease inmate recidivism rates.

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\*Note: standard errors reported in parenthesis / statistically significant at  $p < 0.05$  unless reported otherwise)

Table 3: Difference in state expenditures in police protection

<b>Police Protection Expenses</b>	<b>1975</b>	<b>1976</b>	<b>1977</b>	<b>1979</b>
Difference in decriminalized states vs. no reform, before & after policy	<b>-0.159*</b>	<b>-0.221**</b>	-0.131	-0.0539
standard error	(0.0670)	(0.0721)	(0.0700)	(0.0805)
Difference after decriminalization was enacted in all states	1.376***	1.393***	1.390***	1.377***
standard error	(0.0483)	(0.0473)	(0.0490)	(0.0488)
N = # of observations	528	528	528	528
R-squared	0.892	0.896	0.893	0.890
F stat	103.2	99.70	99.21	100.2
Standard errors in parentheses: * p<0.05 **p<0.01 ***p<0.001				

\*Variables are reported in logs

\*\* Reports difference in difference variable as the difference between Group A & Group B, before and after decriminalization was enacted

Table 4: Difference in state expenditures in public safety

<b>Public Safety</b>	<b>1975</b>	<b>1976</b>	<b>1977</b>	<b>1979</b>
Difference in decriminalized states vs. no reform, before & after policy	<b>0.102**</b>	<b>0.125***</b>	0.0535	0.0390
standard error	(0.0372)	(0.0259)	(0.0360)	(0.0386)
Difference after decriminalization was enacted in all states	0.889***	0.880***	0.885***	0.887***
standard error	(0.0202)	(0.0194)	(0.0193)	(0.0192)
N = # of observations	528	528	528	528
R-squared	0.943	0.946	0.942	0.942
F stat	274.2	307.2	284.2	299.1
Standard errors in parentheses: * p<0.05 **p<0.01 ***p<0.001				

\*Variables are reported in logs

\*\* Reports difference in difference variable as the difference between Group A & Group B, before and after decriminalization was enacted

The graph below (Figure I) shows the effect of decriminalization between states that enacted the reform (“Decriminalized”), versus states that did not make changes to the marijuana laws (“No Reform”). Decriminalized states experienced slightly higher expenditures in police protection per capita in 1975 and 1976 but the cost decreased in subsequent years. By 1980, No Reform states had higher police protection expenses per capita than those states that decriminalized.

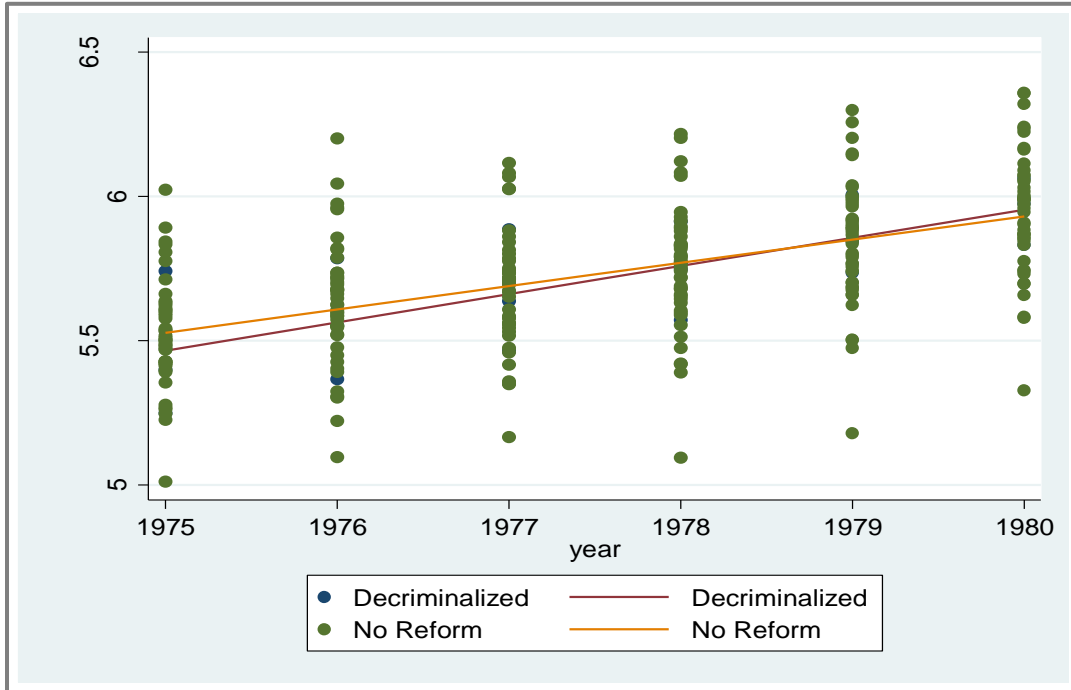
Figure 1: Difference in police protection expenditures 1975-1980 (per capita, log)



The graph representing the difference in public safety expenses per capita (Figure 2) produced the opposite effect shown above for police protection expenditures. No Reform states have slightly higher expenditures in public safety per capita in 1975 and 1976 but differences diminished over the next few years and decriminalized states public safety expenditures slightly increased by 1980. The figures clearly show the re-distribution of savings that decriminalized states experienced.

The No Reform states experienced increasing cost in both public safety and police protection expenditures over the same time period.

Figure 2: Difference in public safety expenditures 1975-1980 (per capita, log)



Another important area revealing significant differences after decriminalization is related to the assumption that individuals using marijuana use may also increase their consumption of tobacco and/or alcohol. The test revealed no significant difference in state revenue from alcohol sales tax. The results indicate decriminalization in 1975 resulted in a positive significant difference between states. Table 5 reveals decriminalized states (OR, CO, OH, CA, ME, MN) experienced a 20% (.101)\* difference in tobacco sale tax revenue (per capita), although all states show slight increases in tobacco tax revenue in the years following decriminalization. The r-squared indicates that the model explained 60% of the variation ( $R^2 = .607$ ). Tobacco sales tax revenue could reflect current hemp stamp tax

(\*Note: standard errors reported in parenthesis / statistically significant at  $p < 0.05$ )

policies that would further increase state revenue. This difference becomes insignificant in later periods revealing little correlation between decriminalization and increased tobacco use. The results provide no significant evidence to support claims that marijuana use is linked to increased use of other drugs such as alcohol.

Table 5: Difference in state revenue from tobacco sales tax

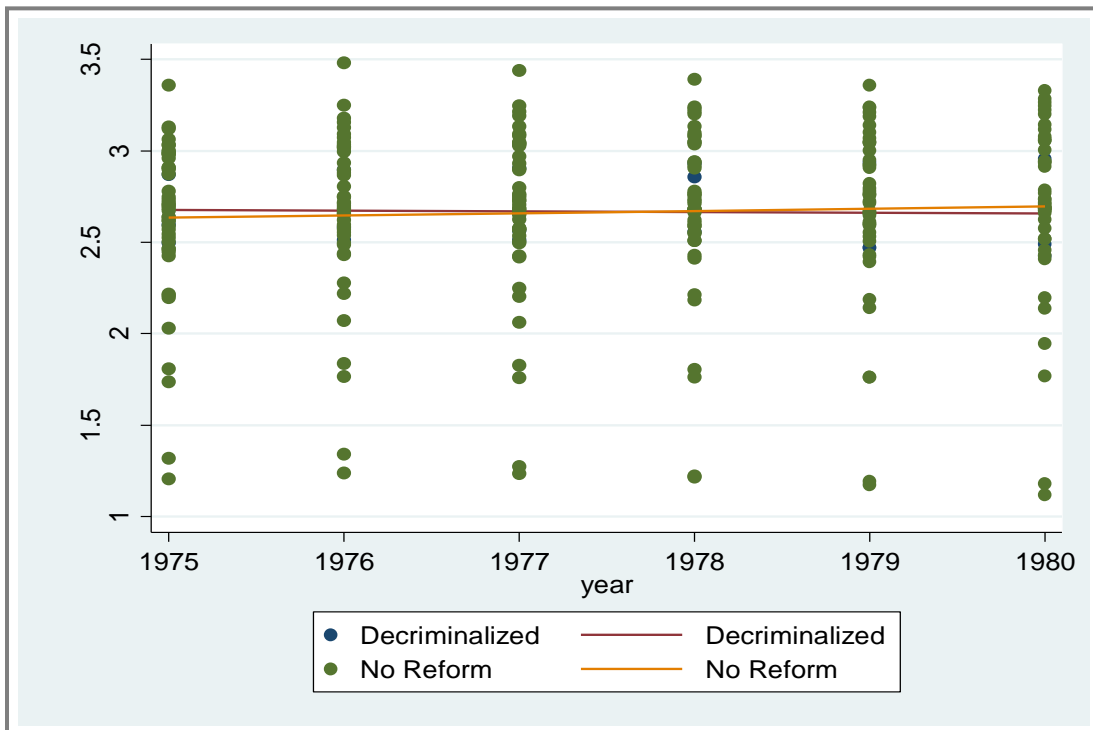
<b>Tobacco Sales Tax Revenue</b>	<b>1975</b>	<b>1976</b>	<b>1977</b>	<b>1979</b>
Difference in decriminalized states vs. no reform, before & after policy	<b>0.230*</b>	0.0685	0.0167	-0.0281
standard error	(0.101)	(0.0724)	(0.0536)	(0.0387)
Difference after decriminalization was enacted in all states	0.388***	0.394***	0.400***	0.409***
standard error	(0.0366)	(0.0369)	(0.0382)	(0.0391)
N = # of observations	528	528	528	528
R-squared	0.607	0.585	0.581	0.581
F stat	21.59	21.22	19.50	19.30
Standard errors in parentheses: * p<0.05 **p<0.01 ***p<0.001				

\*Variables are reported in logs

\*\* Reports difference in difference variable as the difference between Group A & Group B, before and after decriminalization was enacted

The graph of tobacco sales revenue per capita shows a slight difference in 1975 with decriminalized states gaining a small increase in sales tax revenue but then becoming insignificantly different from the No Reform states (Figure 3).

Figure 3: Difference in tobacco sales tax revenue 1975-1980 (per capita, log)



## PART II: CLOSER LOOK

The difference in difference model can be sensitive to the number of years applied to the test; smaller time spans are suggested to see a true difference as a result of a policy change. The same variables, as defined in Part I were applied using the same technique. The only change was the decrease in time span in which the study covered. Another test was performed to include only 7 years for each decriminalization year to test the validity of the significant results reported above. Thus decriminalization in 1975 was regressed using the years 1972-1978, representing 3 years prior to policy change and 3 years after. Decriminalization in 1976 and 1977 were regressed using years 1973-1979. This compressed model will indicate if these changes were in fact immediate and short-term or offered lingering effects. The compressed model tested 336 observations across states and time and revealed similar results found in the broad model above. The estimates show relatively larger differences in the key variables (policing and tobacco tax) that were significant in the original model. All other variables reveal decriminalization produced insignificant differences between states and report no drastic changes in a state's economy for enacting decriminalization.

In 1976, expenditures in police protection were negatively different by 15% (.0696) \* per capita and public safety positively differed by 9% (.0251)\* per capita. The coefficients are statistically significant with a p-value less than 0.05 and 0.001 respectively. The r-squared indicates that the model explained approximately 90% of the variation ( $R^2 = .842 / R^2 = .913$ ). The difference effect is increased in the compressed

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(\*Note: standard errors reported in parenthesis)

model, showing that effects of decriminalization on state expenditures were significantly different in states that enacted the policy but the differences were only temporary.

Table 6: Difference in state expenditures in police protection – 7 years

<b>Police Protection Expenses - 7 yr difference</b>	<b>1975</b>	<b>1976</b>	<b>1977</b>
Difference in decriminalized states vs. no reform, before & after policy	-0.0874	<b>-0.155*</b>	-0.0972
standard error	(0.0511)	(0.0696)	(0.0581)
Difference after decriminalization was enacted in all states	0.854***	0.919***	0.918***
standard error	(0.0378)	(0.0408)	(0.0429)
N = # of observations	336	336	336
R-squared	0.848	0.842	0.839
F stat	95.99	94.10	94.24
Years Tested in Model	1970-1976	1972-1978	1973-1979
Standard errors in parentheses: * p<0.05 **p<0.01 ***p<0.001			

\*Variables are reported in logs

\*\* Reports difference in difference variable as the difference between Group A & Group B, before and after decriminalization was enacted

Table 7: Difference in state expenditures in public safety – 7 years

<b>Public Safety Expenses - 7 year difference</b>	<b>1975</b>	<b>1976</b>	<b>1977</b>
Difference in decriminalized states vs. no reform, before & after policy	<b>0.0810***</b>	<b>0.0920***</b>	0.0267
standard error	(0.0146)	(0.0251)	(0.0249)
Difference after decriminalization was enacted in all states	0.525***	0.549***	0.555***
standard error	(0.0182)	(0.0192)	(0.0193)
N = # of observations	336	336	336
R-squared	0.907	0.913	0.908
F stat	1412.4	185.4	147.1
Years Tested in Model	1970-1976	1972-1978	1973-1979
Standard errors in parentheses: * p<0.05 **p<0.01 ***p<0.001			

\*Variables are reported in logs

\*\* Reports difference in difference variable as the difference between Group A & Group B, before and after decriminalization was enacted



The difference in state revenue on tax of tobacco sales became insignificant in the compressed model. These results suggest the difference in amount of tax collected by states during 1975 was not immediately higher, implying tobacco sales may not automatically increase due to increased marijuana use. The closer look models imply the immediate effects of decriminalization do not drastically effect state resources but allow for potential savings to be redistributed in subsequent years.

Table 8: Difference in state revenue in tobacco sales tax – 7 years

<b>Tobacco Sales Tax Revenue</b>	<b>1975</b>	<b>1976</b>	<b>1977</b>
Difference in decriminalized states vs. no reform, before & after policy	0.163	0.00579	-0.0136
standard error	(0.128)	(0.0506)	(0.0386)
Difference after decriminalization was enacted in all states	0.180***	0.110***	0.114***
standard error	(0.0284)	(0.0218)	(0.0217)
N # of observations	336	336	336
R-squared	0.400	0.263	0.264
F stat	9.586	6.837	6.677
Years Tested in Model	1970-1976	1972-1978	1973-1979
Standard errors in parentheses: * p<0.05 **p<0.01 ***p<0.001			

\*Variables are reported in logs

\*\* Reports difference in difference variable as the difference between Group A & Group B, before and after decriminalization was enacted

## DISCUSSION

The methodology of applying the difference in difference model within fixed effects provide a simple model to compare differences after policy changes. The study empirically addresses the claims provided in the theories posted in previous research on effects of decriminalization. Although all social costs cannot be adequately measured, the results find that decriminalization displays insignificant differences across states. The research complements the work of Single (1989), concluding that decriminalization could allow law enforcement the ability to redistribute resources without significant increases in criminal behavior.

This research outlines a trend of decriminalization in the 1970's that immediately halted in 1980 and did not re-appear for decades. Decriminalization was ignored in state legislation until the 21<sup>st</sup> century with the exception of medical marijuana reform policies that were enacted in the late 90's starting with California in 1996 (Siff). The trend featured in the tables (8 & 9) below may reflect a state's support for voters' preferences despite federal law. The defiance of federal authority also represents state resistance to federal pressures. President Regan initiated a zero-tolerance policy continuing the *War on Drugs* through the 1980's which doubled the cost to taxpayers in less than a decade and "militarized" the police through the creation of special enforcement agencies (Jakubiec, Kilce, Sager ,2009). It is possible the demands for incentives from the federal government obstructed the effort of states toward pursuing criminal justice reform after 1979. The current trend of the 21<sup>st</sup> century may represent a more cohesive political environment for states legislatures to exert their preferences over federal directives.

Table 9: Trend comparison of decriminalization

Decriminalization in 1970's vs. Decriminalization in 21st century

State	Year	State	Year
Oregon	1973	Nevada	2001
Colorado	1975	Massachusetts	2008
Ohio	1975	Connecticut	2011
California	1976	Rhode Island	2012
Maine	1976	Washington	2012
Minnesota	1976	Vermont	2013
Mississippi	1977	Alaska	2014
New York	1977	DC	2014
North Carolina	1977	Maryland	2014
Nebraska	1979	Delaware	2015
		Illinois	2016
		Missouri	2017

Dates from above tables were reported from Marijuana Policy Project

Supporters of marijuana reform claim prohibition, including the federal *War on Drugs* has placed an unnecessary burden on state finances, particular in law enforcement and prosecution. Decriminalization allows states to apply an alternate policy that may limit concerns of widespread use and possibly produce revenue for the state if tax policies are formed. As states follow the trend toward legalization and medical marijuana reform, a comparison policy study will address long term implications better than cost benefit analysis.

Market supply and demand effects are important but if the drug remains illegal then the research has little validity in relation to a commodity within a state controlled market. Medical marijuana policies and effects on health were intentionally left out of the study as it poses different questions unrelated to decriminalization. The rates of incarceration and cost pertaining to correctional institutions specifically were not included in the study as little data was available across all 48 states during this time period. Also some states have

opted to privatize their prison system in the 1980's and 1990's which may not be directly linked to the state budget as total cost of incarceration. Private industries control prisons in 27 states which are guaranteed money for each prisoner, despite companies admitted efforts of operating with less staff to reduce cost per inmate. (Pelaez, 2016).

The research is limited in that it assumes changes in policy will produce the same effect in every state. In reality, public perception, cultural identity and lifestyles help define policy choices and how they are implemented. The research provides statistical evidence on the implications of decriminalization. As reported through econometric analysis, there exist few significant differences to a state's well being for enacting decriminalization. The only significant findings indicate a cost savings to states in criminal justice resources that could be utilized to support other public sectors. With better availability of data and recent marijuana legalization policies enacted, the analysis may provide more significant difference between states.

Decriminalization requires a minor reform in criminal justice policies that produce savings in police expenditures that could allow states the ability to redistribute resources more efficiently maximizing the benefits to the public. Reforming laws regarding marijuana use and possession should be explored beyond drug use and market effects due to changes in supply and demand. Decriminalization can be pursued in a variety of forms that could enhance police-community relations, spur innovation in agriculture, expose under-developed regions to new economic activities and encourage support in local industries.

Decriminalization coincides with the current social attitudes of resentment toward government and outdated policies that no longer coincide with the public economic or

societal interests. A survey that Pew Research Center conducted in 2015 revealed 57% of Americans are “frustrated” with the federal government, and view Congress as negatively influencing our country (Smith). Decriminalization can incorporate other recent trends beyond criminal justice reform such as support for local products, sustainable farming and promoting domestic goods. Some states are only beginning to explore the benefits of using marijuana as an agricultural commodity which may translate into reduced exports of hemp for use in products, increases in state GDP, and global competition in hemp resources.

The research concluded in this paper can be viewed as a transparent overview into the actual implications caused by decriminalization in the 1970’s. The research conducted in this paper does not attribute support for marijuana legalization, but could be applied as a guide to measure impacts on policy decisions related to marijuana reform. The highlights of the paper suggest prohibition cost state governments more to implement than the protection offered by the policy. However, decriminalization aims to reduce law enforcement expenditures and improve the adverse effects caused by imposing harsh drug sentences on the disenfranchised portion of the population (Jakubiec, Kilce, Sager, 2009).

Drug enforcement policies continue to face criticism over excessive cost relevant to the societal benefits and are often ridiculed for losing the war on drugs (Jakubiec, Kilcer and Sager, 2009). Decriminalization offers reform that presents minor implications to state finances and taxpayers pockets. States that did enact marijuana reform policies such as decriminalization are able to redistribute scarce resources to critical areas and engage in opportunities to explore marijuana as an agricultural commodity.

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## APPENDIX A: DEFINITION OF VARIABLES

### Crime Variables

*Property Crime Rate (ln\_pcr)*: number of reported offenses per 100,000 of the population. Property crimes are linked to non-violent offense. Data provided by the FBI UCR reporting tool, Retrieved: [www.ucrdatatool.gov](http://www.ucrdatatool.gov)

*Violent Crime Rate (ln\_vcr)*: number of reported offenses per 100,000 of the population. Violent Crime includes murder, manslaughter, homicide, rape and other violent criminal behaviors. Data provided by the FBI UCR reporting tool, Retrieved: [www.ucrdatatool.gov](http://www.ucrdatatool.gov)

*Murder/Manslaughter Rate (ln\_murd)*: number of reported offenses per 100,000 population. Murder and non negligent manslaughter are defined by the FBI as the willful (non negligent) killing of one human being by another. Deaths caused by negligence, attempts to kill, assaults to kill, suicides, and accidental deaths are excluded Data provided by the FBI UCR reporting tool, Retrieved: [www.ucrdatatool.gov](http://www.ucrdatatool.gov)

*Larceny Rate (ln\_larc)*: number of reported offenses per 100,000 population. Larceny is defined by the FBI as the unlawful taking, carrying, leading, or riding away of property from the possession or constructive possession of another. Examples are thefts of bicycles, motor vehicle parts and accessories, shoplifting, pocket picking, or the stealing of any property or article that is not taken by force and violence or by fraud. Attempted larcenies are included. Data provided by the FBI UCR reporting tool, Retrieved: [www.ucrdatatool.gov](http://www.ucrdatatool.gov)

*Population (ln\_pop)*: the number of people reported in the state, collected from the FBI uniform reporting tool and compared to data in the Census Bureau to ensure accuracy in generating per capita expenditures.

Economic Variables:

All economic variables are converted into terms per capita as represented by population in each state. All finance data is measured dollars. The following variables were gathered by request to the Census Bureau, State Finances, and Tax Collections 1960-2012:

Retrieved://www2.census.gov/pub/outgoing/govs/special60

*Personal Income (ln\_pi)*: individual income received for consumption expenditures. *Alcohol Sales Tax Revenue (ln\_alctx)* & *Tobacco Tax Revenue (ln\_tobtx)*: are defined under "Sales Gross Receipt Taxes". Taxes are defined, including "licenses" at more than nominal rates, based on volume or value of transfers of goods or services; upon gross receipts, or upon gross income; and related taxes based upon use, storage, production (other than severance of natural resources), importation, or consumption of goods. Dealer discounts of "commissions" allowed to merchants for collection of taxes from consumers are excluded. Comprises:

1. *Alcoholic beverages*. Selective sales and gross receipts taxes on alcoholic beverages.
2. *Tobacco products*. Selective sales and gross receipts taxes on tobacco products, including cigarette tubes and papers.

*Corrections (ln\_corr)*: Confinement and correction of adults and minors convicted of offenses against the law, and pardon, probation, and parole activities.

*Police Protection (ln\_prot)*: Preservation of law and order and traffic safety. Includes police patrols and communications, crime prevention activities, detention and custody of persons awaiting trial, traffic safety, and vehicular inspection.

*Public Safety (ln\_pbsf)*: Comprises the functions of *Police Protection*, *Fire Protection*, *Correction*, and *Protective Inspection and Regulation*.

*Public Welfare (ln\_welf)*: Support of and assistance to needy persons contingent upon their need. Excludes pensions to former employees and other benefits not contingent on need. Expenditures under this heading include: *Cash Assistance* paid directly to needy persons under the categorical programs (Aid to Families with Dependent Children) and under any other welfare programs; *Vendor Payments* made directly to private purveyors for medical care, burials, and other commodities and services provided under welfare programs; and provision and operation by the government of welfare institutions including nursing homes not directly associated with a government hospital. *Other Public Welfare* includes payments to other governments for welfare purposes, amounts for administration, support of private welfare agencies, and other public welfare services.

*Education (ln\_edu)*: Schools, colleges, and other educational institutions (e.g., for blind, deaf, and other handicapped individuals) and educational programs for adults, veterans, and other special classes.

*Higher Education (ln\_coll)*: includes activities of institutions operated by the state, except that agricultural extension services and experiment stations are classified under *Natural Resources*, and hospitals serving the public are classified under *Hospitals*. Revenue and expenditure for dormitories, cafeterias, athletic events, bookstores, and other *Auxiliary Enterprises* financed mainly through charges for services are reported on a gross basis.

*Farm Output Index (ln\_farm)*: (Indices of total farm output by State. Indices are relative to Alabama in 1996 = 1. The data is from Agricultural Productivity in US, USDA ERS.

Retrieved:[www.ers.usda.gov/webdocs/DataFiles/Agricultural\\_Productivity\\_in...//table03](http://www.ers.usda.gov/webdocs/DataFiles/Agricultural_Productivity_in...//table03)

APPENDIX B: REGRESSION RESULT TABLES

	Violent Crime Rate (log)			Full Data Set: 1970-1979	
	(1973) ln_vcr	(1975) ln_vcr	(1976) ln_vcr	(1977) ln_vcr	(1979) ln_vcr
post	0.585*** (14.87)	0.585*** (14.54)	0.581*** (14.02)	0.598*** (14.06)	0.607*** (14.24)
did73	0.111*** (4.73)				
1970.year	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
1971.year	0.0953*** (5.98)	0.0953*** (5.98)	0.0953*** (5.98)	0.0953*** (5.98)	0.0953*** (5.98)
1972.year	0.149*** (8.47)	0.149*** (8.47)	0.149*** (8.47)	0.149*** (8.47)	0.149*** (8.47)
1973.year	0.218*** (8.45)	0.220*** (8.74)	0.220*** (8.74)	0.220*** (8.74)	0.220*** (8.74)
1974.year	0.315*** (14.08)	0.318*** (14.41)	0.318*** (14.41)	0.318*** (14.41)	0.318*** (14.41)
1975.year	0.397*** (14.86)	0.397*** (14.53)	0.400*** (15.10)	0.400*** (15.10)	0.400*** (15.10)
1976.year	0.359*** (11.10)	0.358*** (10.89)	0.354*** (10.97)	0.361*** (11.24)	0.361*** (11.24)
1977.year	0.399*** (11.66)	0.398*** (11.33)	0.394*** (11.28)	0.411*** (11.34)	0.401*** (11.82)
1978.year	0.447*** (12.43)	0.446*** (12.13)	0.442*** (11.91)	0.459*** (11.93)	0.449*** (12.56)
1979.year	-0.0440*** (-3.54)	-0.0440*** (-3.54)	-0.0440*** (-3.54)	-0.0440*** (-3.54)	-0.0440*** (-3.54)
1980.year	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
did75		0.0409 (0.61)			
did76			0.0524 (0.84)		
did77				-0.0525 (-1.00)	
did79					-0.0923* (-2.26)
_cons	5.392*** (242.82)	5.392*** (241.37)	5.392*** (241.78)	5.392*** (241.99)	5.392*** (242.84)
<i>N</i>	528	528	528	528	528

*t* statistics in parentheses  
 \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Alcohol Sales Tax Revenue (per capita, log)

	(1973)	(1975)	(1976)	(1977)	(1979)
	ln_alctx	ln_alctx	ln_alctx	ln_alctx	ln_alctx
post	0.430*** (7.79)	0.429*** (7.66)	0.420*** (7.78)	0.410*** (7.21)	0.411*** (7.16)
did73	0.365*** (11.78)				
1970.year	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
1971.year	0.0516*** (6.16)	0.0516*** (6.16)	0.0516*** (6.16)	0.0516*** (6.16)	0.0516*** (6.16)
1972.year	0.167*** (5.35)	0.167*** (5.35)	0.167*** (5.35)	0.167*** (5.35)	0.167*** (5.35)
1973.year	0.216*** (6.62)	0.224*** (7.19)	0.224*** (7.19)	0.224*** (7.19)	0.224*** (7.19)
1974.year	0.259*** (7.61)	0.266*** (8.19)	0.266*** (8.19)	0.266*** (8.19)	0.266*** (8.19)
1975.year	0.269*** (8.03)	0.267*** (7.65)	0.277*** (8.57)	0.277*** (8.57)	0.277*** (8.57)
1976.year	0.324*** (9.35)	0.323*** (9.02)	0.314*** (10.16)	0.332*** (9.58)	0.332*** (9.58)
1977.year	0.324*** (6.57)	0.322*** (6.39)	0.314*** (6.53)	0.304*** (5.97)	0.332*** (6.70)
1978.year	0.376*** (7.29)	0.374*** (7.14)	0.365*** (7.30)	0.356*** (6.65)	0.383*** (7.32)
1979.year	-0.0183* (-2.65)	-0.0183* (-2.65)	-0.0183* (-2.65)	-0.0183* (-2.65)	-0.0183* (-2.65)
1980.year	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
did75		0.152 (0.96)			
did76			0.144 (1.18)		
did77				0.148 (1.52)	
did79					0.131 (1.57)
_cons	1.825*** (59.48)	1.825*** (58.45)	1.825*** (59.75)	1.825*** (59.53)	1.825*** (59.08)
N	528	528	528	528	528

t statistics in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Tobacco Sales Tax Revenue (per capita, log)					
	(1973)	(1975)	(1976)	(1977)	(1979)
	ln_tobtx	ln_tobtx	ln_tobtx	ln_tobtx	ln_tobtx
post	0.395*** (10.68)	0.388*** (10.62)	0.394*** (10.67)	0.400*** (10.46)	0.409*** (10.45)
did73	0.390*** (14.81)				
1970.year	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
1971.year	0.0836*** (5.61)	0.0836*** (5.61)	0.0836*** (5.61)	0.0836*** (5.61)	0.0836*** (5.61)
1972.year	0.208*** (9.51)	0.208*** (9.51)	0.208*** (9.51)	0.208*** (9.51)	0.208*** (9.51)
1973.year	0.263*** (8.62)	0.271*** (8.44)	0.271*** (8.44)	0.271*** (8.44)	0.271*** (8.44)
1974.year	0.310*** (9.87)	0.318*** (9.77)	0.318*** (9.77)	0.318*** (9.77)	0.318*** (9.77)
1975.year	0.322*** (10.29)	0.316*** (10.27)	0.330*** (10.16)	0.330*** (10.16)	0.330*** (10.16)
1976.year	0.368*** (11.47)	0.362*** (11.41)	0.368*** (11.41)	0.376*** (11.43)	0.376*** (11.43)
1977.year	0.365*** (11.15)	0.359*** (11.10)	0.365*** (11.09)	0.370*** (10.73)	0.373*** (11.15)
1978.year	0.390*** (10.32)	0.383*** (10.78)	0.389*** (10.65)	0.395*** (10.32)	0.398*** (10.42)
1979.year	-0.0210 (-1.87)	-0.0210 (-1.87)	-0.0210 (-1.87)	-0.0210 (-1.87)	-0.0210 (-1.87)
1980.year	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
did75		0.230* (2.28)			
did76			0.0685 (0.95)		
did77				0.0167 (0.31)	
did79					-0.0281 (-0.73)
_cons	2.289*** (91.65)	2.289*** (92.40)	2.289*** (89.22)	2.289*** (88.68)	2.289*** (88.36)
<i>N</i>	528	528	528	528	528

*t* statistics in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Police Protection Expenditures (per capita, log)

	(1973)	(1975)	(1976)	(1977)	(1979)
	ln_prot	ln_prot	ln_prot	ln_prot	ln_prot
post	1.368*** (28.19)	1.376*** (28.50)	1.393*** (29.44)	1.390*** (28.39)	1.377*** (28.21)
did73	-0.125*** (-4.31)				
1970.year	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
1971.year	0.122*** (6.52)	0.122*** (6.52)	0.122*** (6.52)	0.122*** (6.52)	0.122*** (6.52)
1972.year	0.205*** (8.03)	0.205*** (8.03)	0.205*** (8.03)	0.205*** (8.03)	0.205*** (8.03)
1973.year	0.317*** (12.23)	0.314*** (12.15)	0.314*** (12.15)	0.314*** (12.15)	0.314*** (12.15)
1974.year	0.488*** (13.53)	0.485*** (13.59)	0.485*** (13.59)	0.485*** (13.59)	0.485*** (13.59)
1975.year	0.668*** (17.82)	0.675*** (17.74)	0.665*** (17.94)	0.665*** (17.94)	0.665*** (17.94)
1976.year	0.788*** (18.49)	0.795*** (18.41)	0.813*** (19.18)	0.785*** (18.67)	0.785*** (18.67)
1977.year	0.931*** (19.55)	0.938*** (19.52)	0.956*** (20.31)	0.953*** (19.64)	0.928*** (19.71)
1978.year	1.056*** (23.20)	1.063*** (23.15)	1.081*** (24.23)	1.078*** (23.38)	1.053*** (23.37)
1979.year	-0.152*** (-7.76)	-0.152*** (-7.76)	-0.152*** (-7.76)	-0.152*** (-7.76)	-0.152*** (-7.76)
1980.year	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
did75		-0.159* (-2.37)			
did76			-0.221** (-3.06)		
did77				-0.131 (-1.88)	
did79					-0.0539 (-0.67)
_cons	1.578*** (54.71)	1.578*** (55.10)	1.578*** (56.95)	1.578*** (55.45)	1.578*** (54.73)
<i>N</i>	528	528	528	528	528

*t* statistics in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$



Public Safety Expenditures (per capita, log)

	(1973)	(1975)	(1976)	(1977)	(1979)
	ln_welf	ln_welf	ln_welf	ln_welf	ln_welf
post	0.801*** (34.59)	0.796*** (33.53)	0.795*** (32.78)	0.794*** (32.04)	0.797*** (31.76)
did73	-0.0784*** (-4.61)				
1970.year	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
1971.year	0.100*** (5.54)	0.100*** (5.54)	0.100*** (5.54)	0.100*** (5.54)	0.100*** (5.54)
1972.year	0.155*** (8.20)	0.155*** (8.20)	0.155*** (8.20)	0.155*** (8.20)	0.155*** (8.20)
1973.year	0.205*** (10.56)	0.203*** (10.24)	0.203*** (10.24)	0.203*** (10.24)	0.203*** (10.24)
1974.year	0.262*** (11.21)	0.261*** (11.01)	0.261*** (11.01)	0.261*** (11.01)	0.261*** (11.01)
1975.year	0.394*** (17.12)	0.390*** (16.15)	0.392*** (16.91)	0.392*** (16.91)	0.392*** (16.91)
1976.year	0.488*** (21.62)	0.484*** (20.33)	0.483*** (19.74)	0.486*** (21.48)	0.486*** (21.48)
1977.year	0.553*** (24.81)	0.549*** (23.76)	0.547*** (23.40)	0.546*** (23.01)	0.551*** (24.98)
1978.year	0.625*** (29.03)	0.621*** (27.94)	0.620*** (27.81)	0.618*** (26.80)	0.624*** (29.18)
1979.year	-0.0930*** (-7.92)	-0.0930*** (-7.92)	-0.0930*** (-7.92)	-0.0930*** (-7.92)	-0.0930*** (-7.92)
1980.year	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
did75		0.0435 (1.52)			
did76			0.0311 (0.75)		
did77				0.0293 (0.76)	
did79					0.00938 (0.27)
_cons	4.121*** (264.83)	4.121*** (258.01)	4.121*** (259.68)	4.121*** (261.11)	4.121*** (260.35)
<i>N</i>	528	528	528	528	528

*t* statistics in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Alcohol Sales Tax Revenue (per capita, log)		A closer look, 7 year difference	
	(1975)	(1976)	(1977)
	ln_alctx	ln_alctx	ln_alctx
post	0 (.)	0.184*** (4.28)	0.174*** (3.96)
did75	0.125 (1.15)		
1972.year	0 (.)		
1973.year	0.0573*** (4.62)	0 (.)	0 (.)
1974.year	0.0995*** (6.58)	0.0421** (3.09)	0.0421** (3.09)
1975.year	0.103*** (6.16)	0.0530*** (5.40)	0.0530*** (5.40)
1976.year	0.158*** (8.23)	0.0961*** (4.85)	0.108*** (6.07)
1977.year	0.157*** (4.18)	0.0957* (2.52)	0.0859* (2.20)
1978.year	0.209*** (5.15)	0.148*** (3.64)	0.138** (3.25)
did76		0.0958 (1.02)	
1979.year		0 (.)	0 (.)
did77			0.116 (1.41)
_cons	1.991*** (121.38)	2.049*** (104.03)	2.049*** (104.95)
<i>N</i>	336	336	336

*t* statistics in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Tobacco Sales Tax Revenue (per capita, log)

	(1975) ln_tobtx	(1976) ln_tobtx	(1977) ln_tobtx
post	0 (.)	0.110 <sup>***</sup> (5.07)	0.114 <sup>***</sup> (5.22)
did75	0.163 (1.28)		
1972.year	0 (.)		
1973.year	0.0628 <sup>**</sup> (3.36)	0 (.)	0 (.)
1974.year	0.110 <sup>***</sup> (4.84)	0.0475 <sup>**</sup> (3.28)	0.0475 <sup>**</sup> (3.28)
1975.year	0.112 <sup>***</sup> (5.60)	0.0597 <sup>***</sup> (3.83)	0.0597 <sup>***</sup> (3.83)
1976.year	0.158 <sup>***</sup> (7.15)	0.105 <sup>***</sup> (6.26)	0.106 <sup>***</sup> (5.64)
1977.year	0.155 <sup>***</sup> (6.86)	0.102 <sup>***</sup> (5.89)	0.105 <sup>***</sup> (6.10)
1978.year	0.180 <sup>***</sup> (6.33)	0.126 <sup>***</sup> (5.31)	0.129 <sup>***</sup> (5.41)
did76		0.00579 (0.11)	
1979.year		0 (.)	0 (.)
did77			-0.0136 (-0.35)
_cons	2.497 <sup>***</sup> (136.86)	2.560 <sup>***</sup> (167.19)	2.560 <sup>***</sup> (166.23)
<i>N</i>	336	336	336

*t* statistics in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Police Protection Expenditures (per capita, log)

	(1975) ln_prot	(1976) ln_prot	(1977) ln_prot
post	0 (.)	0.919*** (22.54)	0.918*** (21.42)
did75	-0.0874 (-1.71)		
1972.year	0 (.)		
1973.year	0.110*** (6.95)	0 (.)	0 (.)
1974.year	0.280*** (12.63)	0.171*** (10.28)	0.171*** (10.28)
1975.year	0.466*** (18.22)	0.351*** (18.20)	0.351*** (18.20)
1976.year	0.586*** (18.57)	0.491*** (16.78)	0.471*** (16.70)
1977.year	0.729*** (19.13)	0.633*** (17.14)	0.632*** (16.22)
1978.year	0.854*** (22.61)	0.758*** (20.70)	0.757*** (19.63)
did76		-0.155* (-2.23)	
1979.year		0 (.)	0 (.)
did77			-0.0972 (-1.67)
_cons	1.782*** (92.25)	1.892*** (92.85)	1.892*** (90.85)
<i>N</i>	336	336	336

*t* statistics in parentheses

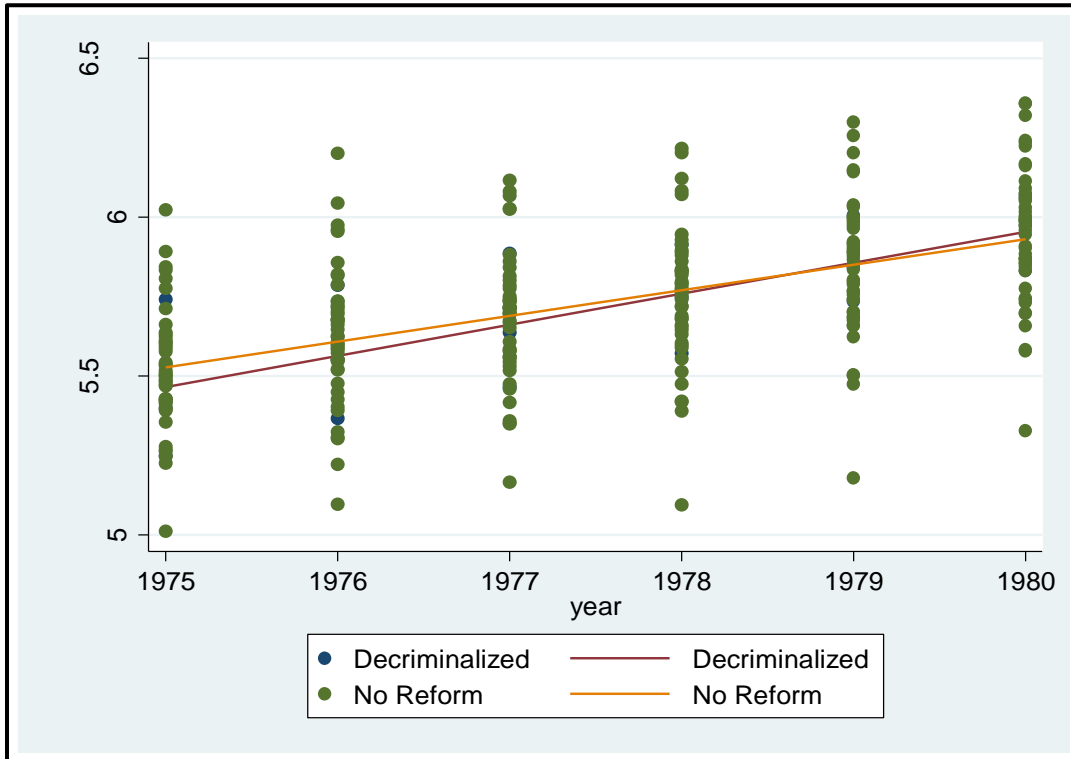
\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

APPENDIX C: FIGURES

State expenditures: police protection 1975-1980, (per capita, logs)



State expenditures: public safety 1975-1980 (per capita, logs)



State revenue: tobacco sales tax 1975-1980 (per capita, logs)

