

The Effect of Education on Property Crime across State

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Abstract

This paper investigates the effects/importance of these independent variables (High School Graduation Rate, GDP growth Rate, GDP per capita, expenditures per capita in terms of police force, expenditures per capita in terms of the court system, employment rate, percentage of people with college degrees, and the average wage rate) on property crimes across the 50 states. The study will use OLS in order to examine the influence of these variables. Based on reviews of other similar studies it is expected that there is a negative correlation between the amount of schooling and property crime.

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1.0 Introduction

Property crime across America has long been an issue that has plagued policymakers and citizens alike. It is one of the foremost topics discussed when politicians are up for election/reelection. People have been continuously searching for the base reasons and causes of property crimes, and have subsequently looked for ways to keep them from occurring.

This study aims to enhance understanding of property crimes in relation to schooling, average income, and funding across the 50 states of the U.S. From a policy perspective this is important because every year when towns, cities, and states look at their budget they invariably conclude that education takes up too large a portion. This study shows the danger of cutting the educational budget in order to save money.

2.0 Research Issue

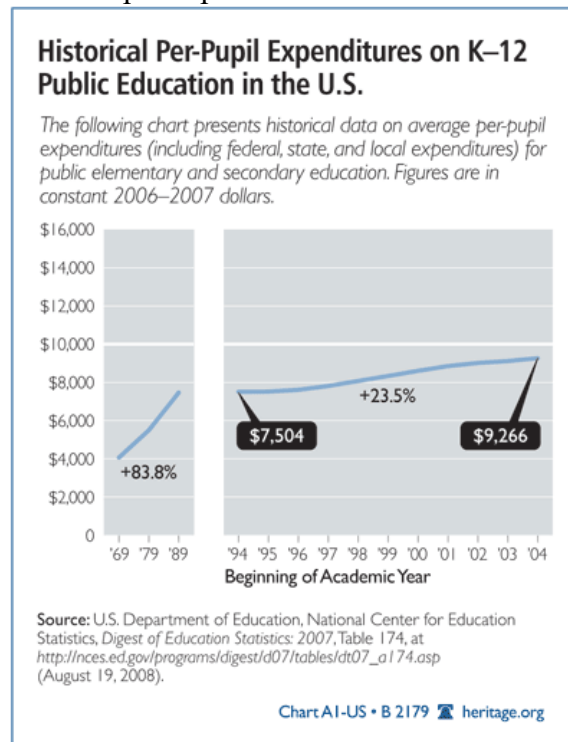
This paper was guided by several research objectives that differ from other studies: First it incorporates the expenditures per capita on police and judicial officials to determine if that is a contributing factor; Second, it incorporates enrollment rates for both elementary and secondary school as well as rates of college graduation and further degrees; Last, it analyzes the funding allotted per student in a per capita basis as well as on a state level. There are a number of research papers on the topic of education and crime rates however none have this papers specific model. This paper is unique in this respect and also in the respect that it does not account for race or gender differences, as many other studies do.

The rest of the paper is organized as follows: Section 2 gives a brief literature review. Section 3 outlines the empirical model. Data and estimation methodology are discussed in section 4. Finally, section 5 presents and discusses the empirical results. This is followed by a conclusion in section 6.

3.0 Trend

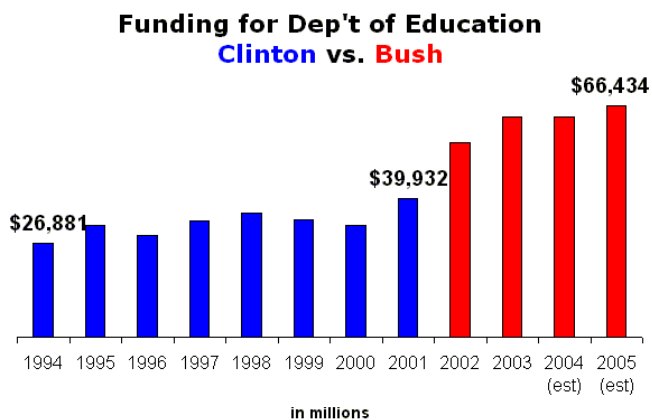
As one can see from the tables below, total expenditures on grades K-12 have increased steadily, though marginally over the course of the past two decades. While at first glance this would appear to be unequivocally beneficial Lips et al. (2008) has this insight: “Federal and state policymakers should resist proposals to increase funding for public education. Historical trends and other evidence suggest that simply increasing funding for public elementary and secondary education has not led to corresponding improvement in academic achievement. Instead of simply increasing funding for education, policymakers and school leaders should implement education reforms that improve resource allocation.”

Figure 1: Historical Per-Pupil Expenditures on K-12 Public Education in the U.S



Source: The Heritage Foundation

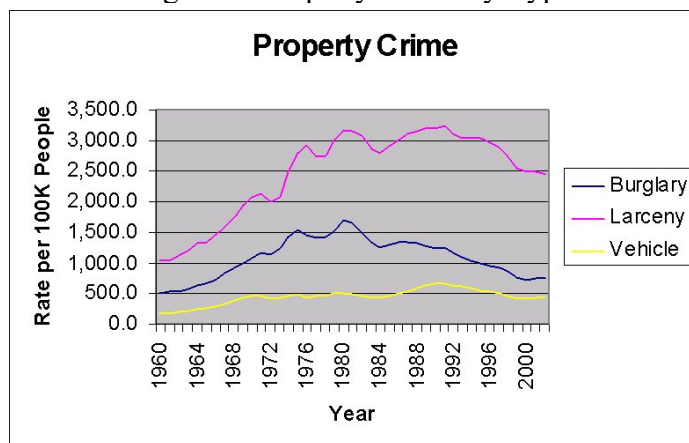
Figure 2: Funding for Education (Clinton Vs. Bush)



Source: The Heritage Foundation

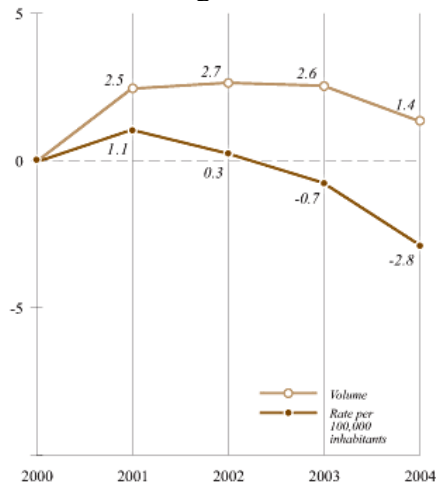
The trend over the past decades regarding property crime has been one of fluctuation. From 1960 to 1980 crimes were climbing at an alarming rate. They seemed to reach a plateau from 1980 to 1992 and have been in subsequent decline thereafter. According to the FBI's research statistics "An estimated 10,328,255 property crimes were committed in the Nation in 2004, representing a 1.1-percent decrease from the 2003 estimate, a 1.4-percent increase compared with the 2000 estimate, and a 14.4-percent decrease from the 1995 estimate."

Figure 3: Property Crime by Type



Source: FBI Crime Statistics

Property Crime since 2000
Figure 4



Source: FBI Crime Statistics

4.0 Literature Review

The empirical studies and literature regarding the topic of education in relation to crime have primarily looked at educational attainment on post-school criminal activity according to a 2007 study done by Lochner. Studies have attempted to estimate the effects of youth arrest and incarceration on educational outcomes. According to Lochner (2007) there are four main effects that education has on crime: education serves to increase wages which raises the opportunity costs of crime, education has shown to alter preferences for risky behavior, education effects the emotional rewards of crime, and education effects who people become friends with/are exposed to.

There is clearly negative correlation between educational success and property crime rates. In a 1996 study Freeman points out that over 66% of all males in jail had not successfully graduated high school. 34% of men with less than a high school degree between the ages of 20-

23 reported earning at least part of their income from criminal activity. This is contrasted by 24% of those with a high school diploma and 17% of college graduates (Lochner, 2004).

Studies have been done that show little or no correlation between education and crime. Such studies often take into account and control for individual characteristics. Studies performed by Witte and Tauchen (1994) are such studies that control for individual characteristics (such as patience, and risk aversion). It is important to note that there is likely correlation between an individual's characteristics and his decisions regarding schooling and criminal activity.

Lochner (2007) points out that there are likely unobserved effects of the community on the amount of crime that takes place. He points out that "While it is often possible to account for permanent unobserved differences across communities by examining the relationship between changes in schooling and crime over time, such an approach cannot account for the effects of changing unobserved community characteristics."

While this study does not take into account "white collar" crimes it is nevertheless relevant to the topic of education and crime. While most studies report that increases in education result in decreases in crime (by varying degrees according to which study is used) there are estimates suggest that white collar arrest rates would increase by 11% (Lochner and Moretti 2004).

A study by Witte and Tauchen (1994) uses a cohort of young men and finds that going to work and going to school significantly decreases criminal activities. Their findings support a claim that "participation in legitimate activities (employment or school) per se has a greater effect on criminal behavior than does the higher income associated with employment or educational attainment."

Because of the seemingly negative correlation between school attendance and crime there have been policies implemented that seek to increase the amount of school required. The main way of doing this is by increasing the minimum drop-out age. A study by Anderson (2009) examines the impact of a minimum drop out age and concludes “evidence suggests that minimum dropout age requirements have a significant and negative effect on property and violent crime arrest rates for youth aged 16 to 18 years-old, and these estimates are robust to a range of specification checks.” He found that increasing the minimum drop out age to 18 reduced arrest rates by about 10%.

5.0 Data and Empirical Methodology

Definition of Variables

1. $LOG_PROP_CRIMES = \text{Log_EXP_Pol} + \text{Log_Exp_JUD} + \text{High_School_Grad} + \text{Growth Rate} + \text{GDP_Per_Capita} + \text{Avg_Wage}$
2. $LOG_VIOLENT_CRIMES = \text{Log_EXP_Pol} + \text{Log_Exp_JUD} + \text{Avg_Wage} + \text{Employment Rate}$
3. $LOG_THEFTS = \text{Log_EXP_Pol} + \text{Log_Exp_JUD} + \text{Avg_Wage} + \text{Employment Rate}$

Log_Prop_Crimes is the log of the total property crimes taken for each state in 2008.

Similarly $\text{Log_Violent_Crimes}$ and Log_Thefts are the logs of the total number of violent crimes and thefts that occurred for each state in 2008. These are the dependent variables that were chosen to represent “crime” as a whole across state. Three different regressions were run in order to properly observe these dependent variables separately.

Independent variables were all obtained from the CPS (current population survey) from the U.S Census Bureau. Figures 5,6, and 7 show the abbreviations and signs for each individual variable used in each regression. The first independent variable used, Log_Exp_Pol , is the log of the total expenditures (in terms of dollars) on the police force per state. More specifically it is the state and government expenditures per capita on the number of police officers per state. The second independent variable, Log_Exp_JUD is similar to the first. However the major

difference is that it is the log of the expenditures, per capita, on the criminal justice system excluding the police force. This would include expenditures on civilian personnel such as judges, lawyers, D.A's and correctional facilities. High_School_Grad is the percentage of people who graduate high school each year by state. Growth Rate represents the GDP growth rate of each state in percentage terms. GDP_Per_Capita represents the average per capita GDP of each citizen per state. Avg_Wage is the average wage rate each person earns per state. Employment Rate represents the percentage or average participation rate of those who are in the work force currently employed (full or part time) in each state.

6.0 Empirical Results

The empirical results regarding the correlation between the independent variables (Log_EXP_Pol, Log_Exp_JUD, High_School_Grad, Growth Rate, GDP_Per_Capita, Avg_Wage, and Employment Rate) and the dependent variables (LOG_THEFTS, LOG_VIOLENT_CRIMES, LOG_PROP_CRIMES) were not encouraging. For each regression run the correlation between the independent variables and the dependent variables were uniformly weak.

Lets begin by analyzing the regression “LOG_PROP_CRIMES= Log_EXP_Pol + Log_Exp_JUD + High_School_Grad + Growth Rate + GDP_Per_Capita + Avg_Wage.” The results of this regression are shown in Table 1. As one can see the Adjusted R-Squared (.267502) is substantially below the necessary requirement in order to be called accurate. What this means is that the independent variables explain only about 26% of the dependent variable (Property Crimes). When the focus is shifted to the independent variables individually one can see that there is not optimal statistical significance throughout. The only variables that are significant at the 95% level are Police Expenditures and Growth Rate. What is key to note is that

Police Expenditures has a positive coefficient. That means that as more is spent on the police force more property crimes are committed. What is more likely is that the expenditures on the police force are in reaction to the amount of property crimes committed and not the other way around. The other independent variables, though statistically irrelevant, all have negative coefficients (as was expected and as supported by other research). This means that as these independent variables increase marginally, Property Crimes (as well as Violent Crimes and Theft) decrease. Growth Rate may be so significant due to the fact that a higher growth rate creates more jobs and so leads to less incentive for property crimes.

Table 1
 Dependent Variable: LOG_PROP_CRIMES
 Method: Least Squares
 Included observations: 51

	Coefficient	Std. Error	t-Statistic	Prob.
POLICE EXPENDITURES	0.596760	0.188948	3.158330	0.0029
JUDICIAL EXPENDITUREWS	-	0.135989	-1.664834	0.1031
HIGH SCHOOL GRADUATION RATE	-	0.005041	-1.576183	0.1221
GROWTH RATE	0.018035	0.009279	-1.943611	0.0584
GDP PER CAPITA	1.59E-07	3.21E-06	0.049633	0.9606
AVG WAGE	-5.77E-06	3.52E-06	-1.640703	0.1080
C	3.470726	0.480053	7.229880	0.0000
R-squared	0.355401	Mean dependent var	3.491475	
Adjusted R-squared	0.267502	S.D. dependent var	0.111151	

Four other variables are significant at (about) the 90% level. These are Judicial Expenditures, Avg Wage, and High School Graduation percentage. What this may imply is that these variables, while somewhat important, are not the main determinants of property crime.

This came as somewhat of a surprise due to others research pointing out that wages and high school graduation rates all are significant when looking at crime in general. It is important to keep in mind that there are likely other major variables that do significantly impact Property Crimes that were not included in this study (as can be seen by the low Adjusted R-Squared).

The next two regressions (Thefts, and Violent_Crimes) use the same independent variables (Log_EXP_Pol + Log_Exp_JUD + Avg_Wage + Employment Rate). One may notice that there are not as many independent variables for these two regressions as there were for Property Crimes. This is due to the fact that it was imperative to get as high an Adjusted R-Squared as possible. Even though the Adjusted R-Squared are low they would have been even lower had the same independent variables been included (as in Log_Prop_Crimes). Table 2 shows the regression results for Violent Crimes. Again notice the very low Adjusted R-Squared (.19). Three of the four variables used were significant at the 95% level: Police Expenditures, Average Wage, and Employment Rate (with Police Expenditures being significant at the 99% level). It can be inferred that these variables have an important effect on the amount of violent crime that occurs statewide. Judicial Expenditures was not significant. This can mean that it does not matter how much is spent on the judicial system, violent offenders will continue to commit crimes regardless. This could have some policy implications when people and politicians say they need to appropriate more funds for the judicial system one could point out that there does not appear to be correlation between the two (less crime and more funds for the judicial system).

Table 2
 Dependent Variable: LOG_VIOLENT_CRIMES
 Method: Least Squares
 Included observations: 51

	Coefficient	Std. Error	t-Statistic	Prob.
POLICE EXPENDITURES	0.634355	0.191317	3.315728	0.0018
JUDICIAL EXPENDITURES	-	0.122245	-1.380025	0.1742
AVG WAGE	-6.11E-06	2.88E-06	-2.119847	0.0394
EMPLOYMENT RATE	-	0.003697	-2.427096	0.0192
C	3.194852	0.386763	8.260488	0.0000
R-squared	0.254961	Mean dependent var	3.501658	
Adjusted R-squared	0.190175	S.D. dependent var	0.110497	

Similar results were found for the Log_Thefts regression (Table 3). There is a very low Adjusted R-Squared (.146) and the independent variables are significant at relatively similar levels. This would lead one to conclude that Thefts and Violent crime are related, at least according to the independent variables used in this study. Of note is that Judicial Expenditures is slightly more significant in this regression which may point toward the judicial system having an effect on the amount of thefts in each state.

Table 3
 Dependent Variable: LOG_THEFTS
 Method: Least Squares
 Included observations: 51

	Coefficient	Std. Error	t-Statistic	Prob.
POLICE EXPENDITURES	0.543446	0.170183	3.193293	0.0025
JUDICIAL EXPENDITURES	-	0.108742	-1.609467	0.1144
AVG WAGE EMPLOYMENT	-5.84E-06	2.56E-06	-2.277978	0.0274
RATE	0.005535	0.003289	-1.682953	0.0992
C	3.009187	0.344040	8.746625	0.0000
R-squared	0.214984	Mean dependent var	3.328917	
Adjusted R-squared	0.146722	S.D. dependent var	0.095756	

When looking at the coefficients for each of these regressions one sees a similar trend to the first regression. That is, that it looks like when one spends more on the police force one sees more crime (when in fact it is likely that the spending is a *result* of crime being committed and the efforts to stop it). The rest of the coefficients follow what was expected and shown by other various studies.

Perhaps the most surprising and unexpected finding according to this research is that it appears as if education is not a significant variable when looking at crime. In fact, when certain education variables were added it was found that they actually decreased the Adjusted R-Squared. This does not coincide with most of the other research done on this subject. This result is somewhat troubling due to the fact that so many papers find a link between education levels and crime levels.

7.0 Conclusion

In summary, the results of this paper suffer from some severe problems. The major problem is the lack of a viable R-Squared. This essentially means that the independent variables do not have very much explanatory power regarding the three dependent variables. However, we can see that some of the independent variables are statistically significant which means that they are important in the overall picture. The variable that seemed to be clearly significant in all cases was that the more police expenditures there were the more overall crime there was. This may seem to be counter intuitive but in fact represents a response to crime rather than a precursor to it. One should not view the results and come to the conclusion “if less is spent on police then crime will go down.” Due to the problems with the results and data one cannot make any concrete conclusions based on this paper. In order to reach any conclusions it would be best to look at other more credible and sophisticated studies that have been done. While it cannot be said that education and increased wages result in less crime (according to this paper) it is likely a safe conclusion that they do in some way reduce crime based on the countless other studies that have been done.

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Appendix A: Variable description and expected sign

Acronym	Variable Description	What it captures	Expected sign
Log_Ex_Pol	Per Capita Expenditures on the Police Force	How much money is being spent on the police force in each state	-
Log_Ex_Jud	Per Capita Expenditures on the criminal justice system	How much money is being spent on the judicial system per state	-
High_School_Grad	% of high school graduates per state	How many people graduate high school per state	-
Growth_Rate	% change in GDP per state each year	How many jobs there may be per state	-
GDP_Per_Capita	Average GDP per capita by state	How wealthy a state is	-
Avg_Wage	Average wage per state	The average wage people earn	-
Employment_Rate	Employment rate per state	How much work there is per state	-