

Determinants of Violent Crime in the U.S: Evidence from State Level Data

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ABSTRACT

This study examines the determinants of violent crime in the United States. It argues that violent crime is affected by socio-economic and public policy factors. To test the hypothesis, the study uses recent state level data on violent crime from FBI uniform crime reports. Fixed effect regression was used to analyze the data. The results indicated that there is a positive relationship between income inequality and crime. An increase in the level of inequality by one unit will result in an increase in violent crime by 330. We also found that control variables, such as state and local government expenditures on policing and public safety, and community development reduce violent crime. Other factors, such as education and population density are not statistically significant, showing they do not directly affect crime. These results help us better understand the determinants of violent crime and what must be done to reduce criminality in our society. First, there have to be policy measures to diminish the trend towards increased income inequality in order to reduce delinquency. Second, states have to continue dedicating adequate resources towards policing and public safety, and increase community development, in order to reduce crime.

INTRODUCTION

Crime is the number one public problem. According to recent data published by the Federal Bureau of Investigation (2013), violent crime levels rose for the first time in six years during 2012, with an increase of 1.5 percent in the Midwest. Between 2011 and 2012, the violent-crime rate rose 15 percent and the property-crime rate rose 12 percent, based on data from the annual National Crime Victimization Survey. The FBI (2010) reported that in 2010 a violent crime occurred every 25.3 seconds in the United States.

Violent crime greatly affects the United States economy. A recent study (Shapiro & Hassett, 2012) found that violence affects tax payers, property owners, and individuals through increased spending on corrections, policing, lost wages, medical expenses and more. It also indicated that violent crimes inflict other, less intangible costs, including the pain

and suffering of victims, a reduced quality of life for everyone, and lower investment levels and property values.

Knowing how violence influences society and the economy, it would be beneficial for the United States to have the ability to lower violent crime. However, previous studies have produced different results regarding the determinants of violent crime. Moreover, most studies used a traditional multiple regression without controlling for state-level specific factors that affect the level of violent crimes. The objective of this paper is to provide a systematic investigation of the determinants of violent crime, with the intention of shedding some light on public policy issues surrounding reducing violent crimes across states. To be more specific, this paper asks the following questions: What variables influence the level of violent crime? What can be done to lower it? In this paper it's argued that violent crime is affected by socio-economic and public policy factors. More specifically, it looks at the relationship between the level of violent crime and income inequality, per capita income, population density, unemployment compensation, home and community development expenditures, police and correction expenditures, and library expenditures. This paper used a fixed effect model to capture the effects of variables, both observable and unobservable that differs across states, but are constant over time. By determining the causes of violent acts, the government will be able to put into place more effective policies that allocate resources for the reductions of crime in a more efficient manner. Effective policies and resource distribution would likely allow the government and the residents of United States to save a great deal of money and increase the quality of life in general.

Theory and Evidence

In the literature on the economics of crime, the economist look at criminals as rational individuals who seek to maximize their individual well-being through illegal instead of legal means. The economic approach toward crime is based on the assumption that the decision to commit a crime, like any other economic decision, can be analyzed as a choice among alternative combinations of costs and benefits. One important application of an economic analysis is that it can be used to predict the effectiveness of law enforcement measures.

Economists all around the world are curious as to what influences violent crime. One plausible policy for reducing crime would seem to be increasing the police force. By using the concept of elasticity, one particular study (Levitt, 2004) found that by increasing police, the crime rate

during the 1990s fell somewhere around 5 percent.

Although, some studies suggest that more police does deter crime, there is still other evidence (Dills & Summers, 2010) that having more police may not always deter crime because violent offense levels were unstable, even though more police were being hired. Prison may have increased crime by turning some criminals into dangerous criminals due to the fact that felons surrounded them all day. Additional variables mentioned in the crime literatures include conceal and carry laws, capital punishment, and the legalization of abortion.

Some previous studies (Cho, 1973) have looked at whether public policies actually had an effect on the levels of violent crime. The overall results indicated that there is a positive correlation between correctional policies and crime deterrence. It is also indicated that other factors, such as racial and ethnic composition, education, income, and density of house populations, are significantly correlated with crime rates. Regarding the economic benefits of reducing crime, in 2010 violent crimes cost Americans somewhere around \$42 billion, which was used for policing, courts, medical bills, lost wages, and more. Many Americans hold their wealth in the value of their homes, when violence causes a reduction in the value of homes many Americans are affected by it. For instance, a reduction in a given year of one homicide in a zip code causes a 1.5 percent increase in housing values in that same zip code the following year (Shapiro & Hassett, 2012).

In cities like Baltimore and Detroit the violent crime levels are not dropping as fast as other major cities because of economic and racial segregation. When a city is more integrated crime is less likely to happen.

DATA AND METHODOLOGY

The crime data is primarily from the FBI uniform crime reports web site (2013). Policy variables are collected from the state policy index web site (2010). The income inequality data is primarily from the state level time series data prepared for Russell Sage program on the social dimensions of inequality (Guetzkow, 2007).

Figure 1 below shows the descriptive statistics of variables used in our regression. Income inequality uses the Gini index. The Gini index, also known as the Gini coefficient, examines a nations income distribution, which can determine the nations income inequality. The Gini index ranges from 0 to 1 with 0 being perfect equality and 1 being perfect inequality. The police expenditure measures the amount of money (in millions) that state and local governments spend on police, firefighters,

and regulatory services. The correction expenditure measures the dollar amount (in millions) that state and local governments spend on corrections, including prisoning and jailing. Unemployment compensation measures the amount (in millions) that state and local governments spend on unemployment benefits. Housing and community development measures the amount of dollars (in millions) that state and local governments spend on developing the communities and housing. Library expenditure measures the amount of dollars (in millions) that state and local governments spend on libraries. Finally, population density measures the population per square mile.

FIGURE 1. DESCRIPTIVE STATISTICS

Variables	Mean	Std. Dev.
Violent Crime (per 100,000 people)	473.1041	245.6827
Inequality (GINI)	.370238	0.026416
Police Expenditure (in millions of dollar)	985.5356	1566.614
Correction Expenditure (million)	544.3934	931.4684
Education Expenditure (million)	6445.936	8386.569
Unemployment Compensation (million)	66.94131	74.89209
Housing and Community Development (million)	346.4688	642.9284
Library Expenditure (million)	90.62048	126.0906
Total Expenditure (million)	22084.14	31392.45
Population Density	169.1227	235.4244
Per Capita Income	19533.33	7084.873

In order to estimate the equation below, we used fixed effect regression to account for all unobserved factors that vary across states but are constant over time. For the baseline model, the results for the random effect model and the model that take cross-sectional dependence into consideration (Driscoll & Kraay, 1998) are also provided.

$$\ln \text{Violent} = \beta_0 + \beta_1 \text{GINI} + [\beta_2 \text{Police} + \beta_3 \text{PopDen} + \beta_4 \text{Com.Dev} + \beta_5 \text{Unempl.Comp} + \beta_6 \text{Lib} + \beta_7 \text{Income} + \beta_8 \text{Corr.} + \varepsilon_t$$

RESULTS AND DISCUSSION

Figure 2 below shows the relationship between violent crime and income inequality between 1965 and 2004. There is a visible positive relation between the two variables. The Central Intelligence Agency (CIA) Fact Book recorded that in 2007 the Gini index of the United States was around 0.45, which is high. The United States has one of the most income-unequal nations and has the largest percentage of its population in prison among developed democratic nations. Efforts at reducing the income gap will provide some solutions to the crime problem, both within the poor neighborhoods as well as to crimes targeted at richer residents.

FIGURE 2

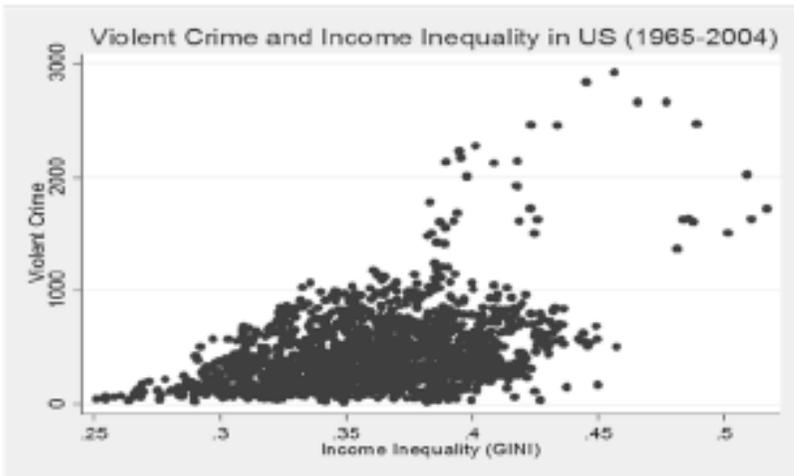


Figure 2. Violent crime and income inequality (1965-2004)

This next figure (figure 3) below represents the changes in the Gini index throughout the United States over a period of around fifty years. It can be seen that in the mid 1970s to early 1980s there was an overall decrease in income inequality. This decrease in income inequality may explain why during the mid 1980s there was a decrease in violent crime. It can also be seen that in the 1990s income inequality began to rise, which may explain the increase in violence in the early to mid-2000s.

FIGURE 3

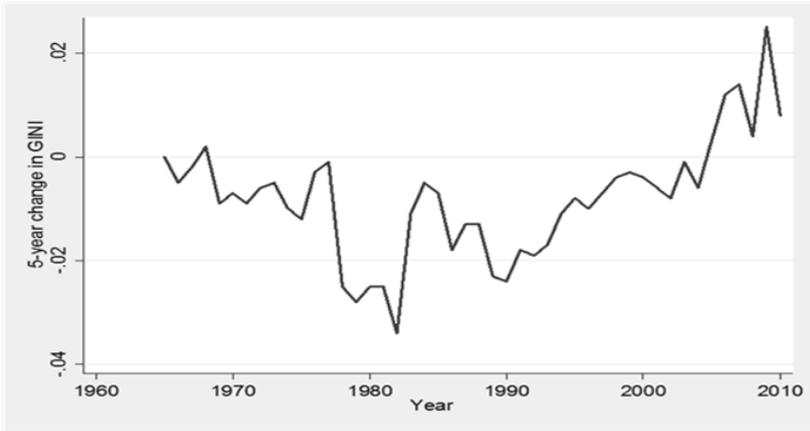


Figure 3. Five-year changes in income inequality in U.S (1960-2010)

Figure 4 below shows the Gini index for each U.S. state throughout the past 45 years or so. Overall, the graph shows an increase in income inequality throughout the recent decades. Between 1979 and 2007, the top 1 percent took home well over half (53.9 percent) of the total increase in U.S. income. Over this period, the average income of the bottom 99 percent of U.S. taxpayers grew by 18.9 percent. Simultaneously, the average income of the top 1 percent grew over 10 times as much—by 200.5 percent (Sommeiller & Price, 2014).

FIGURE 4. Income inequalities in U.S by State

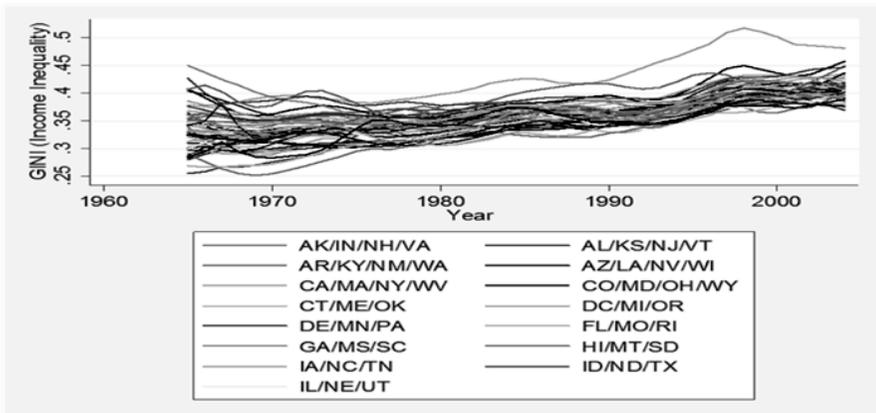


Figure 5 below presents the baseline model that shows the relationship between violent crime and income inequality. The results provide a fixed effect, a random effect and a fixed effect model that control for cross-sectional independence. It can be seen that the Gini index, the variable of interest, which represents income distribution, is statistically significant. The existence of a very strong positive relationship between the two variables means that as income inequality increases so will levels of violent crime. By taking the exponential value Gini coefficient (5.80) one is able to determine that when income inequality increases by one unit, violent crime will increase by 330 units per 100,000 people. The result is consistent with previous study (Hsieh & Pugh, 1993) the meta-analysis study that found violent crime to be strongly associated with both income inequality and poverty.

FIGURE 5. Violent crime and income inequality in U.S (1965-2004)

VARIABLES	(1) Fixed Effect Model	(2) Random Effect GLS	(3) Fixed Effect (DK Std. err.)
GINI	5.80*** (0.288)	5.83*** (0.261)	5.80* (2.207)
Constant	3.74*** (0.105)	3.73*** (0.123)	3.74*** (0.839)
N	2,040	2,040	2,040
R ²	0.19	0.20	0.20
Adj. R ²		0.20	0.20
Number of groups		51	51

Robust standard errors in parentheses
 *** p<0.001, ** p<0.01, * p<0.05

Figure 6, below presents the complete model of the fixed effect regression. The independent variables include both the socio-economic and public policy factors. It can be seen again that income inequality is statistically significant and has a positive relationship to violent crime. Police expenditure is also statistically significant; however, it is negatively related to violent crime. This means that as police expenditures increase, violent crime levels will be expected to decrease. The result has an important implication that increasing the number of police may curb the likelihood of individuals committing acts of violence. Housing and community development was likewise statistically significant and negatively related. Unemployment compensation was somewhat statistically significant and positively related to violence levels. A good community program such as after school youth programs or community extracurricular programs may limit the suitability of location for crime and increase public safety. Moreover, it may increase educational and recreational

opportunities for young adults, and may increase the capacity of local people to deal with social problems in their area. Library expenditures were negatively related to violence levels. Opening a library for local community may play a role for creating an educational opportunity for young adults and create good citizens.

Population density is weakly statistically significant, however, it was negatively related, which is opposite to what one would have expected. This finding suggest, that as population increases per square mile, violence is less likely to occur due to there being more witnesses around and the idea that the crime is more likely to be reported.

Correction expenditure was statistically significant and positively related to violence. For many states the opportunity cost of the resources used for corrections is becoming too high since it results in less money available for other priorities like education or infrastructure. There is evidence that increased incarceration rates have some effect on reducing crime, but crime rates are shaped by many other factors discussed above.

FIGURE 6. Determinants of violent crime in U.S

VARIABLES	(1) Fixed Effect Model
Income Inequality	1.2815*** (0.2964)
Police Expenditure	-0.0130*** (0.003)
Housing & Com. Dev.	-0.0001*** (0.0000)
unemployment Comp.	0.0398* (0.0144)
Library Exp.	-0.0101 (0.01353)
Population Density	-0.0014* (0.0005)
Correction Exp.	0.0159** (0.0031)
Per capita Income	3.34e-06 (0.000)
Constant	5.59*** (0.158)
Observations	1,150
R-squared	0.91
Adj. R-squared	0.91

Robust standard errors in parentheses
 *** p<0.001, ** p<0.01, * p<0.05

CONCLUSION

The rate of violent crime in the United States is constantly changing in what seems to be unpredictable ways. Without knowing what variables influence the level of violent crime, many resources are going to waste and policies designed to combat crime become less effective. These research findings indicate that violent crime is mostly influenced by income inequality. When income inequality increases by one unit it will result in an increase of violent crime by 330 units. Additional variables that affected violent crime include: state and local government expenditure on policing and public safety, housing and community development, and population density. Knowing what variables influence violent crime will allow for more effective policies to be put into place and also allow for resources to be allocated more efficiently. A reduction in violent crime would increase the value of homes in many parts of The United States and may lead to a decrease in taxes for policing and corrections. According to a prior research (Shapiro & Hassett, 2012) a 10% reduction in violent crime would save Americans around \$20 billion a year. If the United States hopes to lower violence levels a focus needs to be placed on how to lower income inequality levels.

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