Research Paper   Open Access

The Economic Impact of Crimes In The United States: A Statistical Analysis on Education, Unemployment And Poverty

[1]Jayshree D. Patel, Reza Fadaei[2]
National University, San Diego, CA
Corresponding Author:1Jayshree D. Patel

ABSTRACT

Aim: Estimating the cost of crimes is essential to evaluate the economy of any country. The statistical facts will guide business adventures in making decision on investment in the particular country because increased crime rates steadily increase the incarceration rate which is considerably costly to taxpayers.

Objectives: The objective of this review is to test the relationship between the selected dependent variable with independent variables applying the multiple regression model. This research selected crime index as a dependent variable. The independent variables selected for this study includes unemployment, poverty, and education. An effort is made to relate variables with criminal activity to suggest possible solutions or remedies.

Methodology: Multiple sources including published articles and government reports are reviewed when estimating the economic losses associated with criminal activity. This study presents a comprehensive methodology for calculating the cost to society for various criminal acts like murder, rape, robbery, aggravated assaults, burglary, larceny, motor vehicle theft etc.

Conclusion: Statistical findings showed that a 1% increase in poverty will increase crime rates by 0.83% and a 1% increase in higher education will decrease crime rates by 0.23% per year. Updated crime cost estimates will help government agencies and other organizations finding remedies that reduce crime.

Keywords: crime, cost, multiple regression, unemployment, poverty, education

----

I.   Introduction

Crimes impose a tremendous cost on society, with lasting negative effects on individuals, families, and communities. Crimes in the 21st century are more sophisticated and better organized than they were before due to advanced information technology. Business adventures are also affected by criminal activities because crime rates steadily increase incarceration rates which are considerably costly to the taxpayers and per capita expenditure. Furthermore, crimes affect businesses by diverting resources to crime prevention and otherwise discouraging investment Crimes are defined as acts or omissions forbidden by law that can be punished by imprisonment and/or fine. Murder, robbery, burglary, rape, aggravated assaults, larceny and motor vehicle theft are common examples. National Incident-Based reporting system (NIBRS 2017) categorized three types such as crimes against persons, crimes against property, and crimes against society. For the present study, crimes are classified into two categories – violent crimes and property crimes. Crimeis a major concern that generates an external cost for individuals and social costs for nations. The economic theory of opportunity cost defines crime as a rational behavior – a choice that is made by a person or persons in deciding how best to spend their time (Fadaei-Tehrani, 1989). Crime is a non-market good that is not traded on the free market. Consumers do not demand crimes. Therefore, it is not formally possible to compute the cost of crimes. The cost of crime is calculated on the basis of monetary awards issued by judge or jury. Some estimation is based on assumptions such as losses of property or productive assets, price effects, employment effects, and tax effects for the individual. objective of this research is to test relationships in the multiple regression models. Crime index was selected as the dependent variable. Unemployment, poverty, and education were designated as independent variables. The purpose of the investigation is to know the relationship between crime and independent variable – unemployment, poverty

And higher education. This study shows the pattern of relationships, whether one variable in the domain relating to other three. Suggestions are made to propose solutions or remedies for the current problem to make the country safe place to live and attract business advantages for domestic and foreign investments.

II.   METHODOLOGY

The cost of crime is calculated on the basis of monetary awards issued by judge or juryandestimationsuchas losses of property or productive assets, price effects, employment effects, and tax effects on individual.The dollar year adjustment is based on inflation. Thereal costs of crimes between 1996 to 2015 are depicted in Figure 1.

Figure 1.The cost of crime in the United States
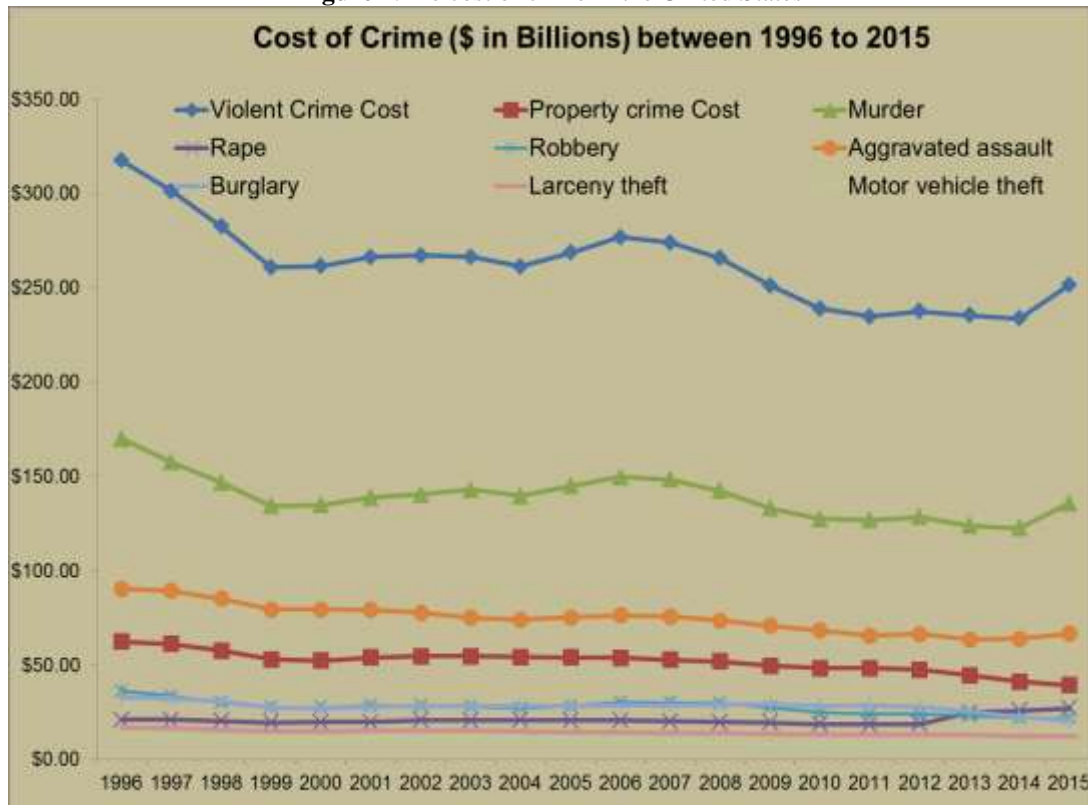
The figure shows the fact that cost of violent crime is six times higher than property crimes. The pattern is shows increased in violent crime cost like murder and rape during last two years. Contrariwise, property crime cost shows decreasing pattern.

2.1 Operational Definition of Dependent Variable

The dependent variable is the crime rate, which is divided into two categories: property crime (burglary, larceny, and motor vehicle theft) and violent crime (murder, rape, robbery, and assault). Regression has used the aggregate violent crime rate and aggregate property crime rate per 100,000 people. The crime rates for each category were acquired from the Federal Bureau of Investigation's Uniform Crime Reporting System. The crimes are chosen as a dependent variable because economic margination affects crimes and this margination focus solely on education, unemployment, and poverty.

2.2 Operational Definition of Independent Variables

For multiple regression analysis, three independent variables were included: unemployment, poverty, and education. The unemployment rates were obtained from the Bureau of Labor Statistics, Graduation rates were obtained from National Center for Educational Statistic, and poverty rates were acquired from Census Bureau. The reason behind including economic indicators such as unemployment rates and poverty rates is relatively straightforward; the less income an individual has may lead them to commit more crimes. Moreover, the inclusion of education rate can be somewhat less economically intuitive, yet, it is assumed that a higher educational attainment could imply more legal income-generating opportunities thus less time for criminal behavior.

III.　STATISTICAL ANALYSIS

　　　　Multiple regression analysis was used to test the relationship between crimes vs. unemployment, crime vs. poverty, and crime vs. education. For each of crime categories – violent crimes and property crimes; independent variables – unemployment, poverty, and higher education, volume and rates per 100,000 inhabitants during 1996-2015 were used for statistical analysis in Table 1.

Table 1 Rates of dependent and independent variables per 100,000 populations*

Year	Violent Crime	Property Crime	Unemployment	Poverty	Higher education
1996	636.6	4,451.0	23566.6	13,066.7	5,408.3
1997	611.0	4,316.3	23858.0	12,758.8	4,941.7
1998	567.6	4,052.5	24373.3	12,398.0	4,500.0
1999	523.0	3,743.6	25209.8	11,454.9	4,216.7
2000	506.5	3,618.3	25592.8	10,866.7	3,966.7
2001	504.5	3,658.1	26056.9	11,368.6	4,741.7
2002	494.4	3,630.6	26735.3	11,794.1	5,783.3
2003	475.8	3,591.2	27206.8	11,851.0	5,991.7
2004	463.2	3,514.1	27691.6	12,113.7	5,541.7
2005	469.0	3,431.5	27661.3	12,270.6	5,083.3
2006	479.3	3,346.6	27996.0	11,852.9	4,608.3
2007	471.8	3,276.4	28737.5	11,802.0	4,616.7
2008	458.6	3,214.6	29437.6	12,503.9	5,800.0
2009	431.9	3,041.3	29540.2	13,594.1	9,283.3
2010	404.5	2,945.9	29931.0	14,256.9	9,608.3
2011	387.1	2,905.4	30436.7	14,307.8	8,933.3
2012	387.8	2,868.0	30936.9	14,303.9	8,075.0
2013	369.1	2,733.6	31660.7	14,170.6	7,366.7
2014	361.6	2,574.1	31955.8	14,062.7	6,166.7
2015	372.6	2,487.0	32500.8	12,939.2	5,258.3

* Data for crime has retrievedfromFederal Bureau of Investigation's Uniform Crime Reporting System; unemployment rates from the Bureau of Labor Statistics; Graduation rates from National Center for Educational Statistic; and poverty rates from Census Bureau=Two regression analysis models were developed. The first model – violent crimes – uses murder includes no negligent manslaughter, rape, robbery, and aggravated assault as a dependent variable. The second model – property crimes – uses burglary, larceny, and motor vehicle theft as a dependent variable.

$$PropCrimeRte = BurglaryRte + LarcenyRte + MotorvehicleRte$$
$$ViolCrimeRte = MurderRte + RapeRte + RobberyRte + AgAssultRte$$

The multiple regression model is indicated as $Y_c = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \mu$
Where:
Y_c = Crime index as a dependent variable
X_1 = Unemployment rate as an independent variable
X_2 = Poverty rate as an independent variable
X_3 = Education rate as an independent variable
β_1, β_2, β_3, and β_4 are the parameter of regression coefficient; b_0 is constant; and $\mu$is an error (technically, U is known as the stochastic disturbance or stochastic error term). Table 2 displays the basic statistics for each variable within the regression model analyzed in this study

Table 2 Summary Statistics

	No. of Observation	Mean	Standard Deviation	Minimum	Maximum
PropCrimeRte	20	3370.0	0541.09	2487.0	4451.0
ViolCrimeRat	20	468.8	0077.51	361.6	636.6
UnemplRte	20	5994.6	2736.49	3966.7	9608.3
PoveRte	20	12686.9	1100.23	10866.7	14307.8
EduRte	20	28054.3	1728.42	23566.6	32500.8

The assumption of linearity in parameter is satisfied since this model is written as $Y_c = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \mu$. The assumption of random sampling is satisfied as the research used available population data from each analyzed variable. The assumption of no perfect collinearity is satisfied as there are no perfect linear relationships among the independent variable. The datashows there are no perfect linear relationships between selected independent variable in the multiple regression model. The assumption, zero conditional mean, is satisfied as the error μ has an expected value of zero for any value of the independent variables. Moreover, the assumption of homoscedasticity is satisfied because the error term has the same variance with any value of the independent variables. Therefore, this regression model satisfies the Gauss-Markov assumptions.

IV.   RESULTS AND DISCUSSION

Crime is a major problem society faces today. Its cost and effects are widely varied. Economists view it as rational behavior. The economic impact of crime is felt by researchers from various branches – sociology, political science, and economics. Statistically, crime is the most expensive product of society not only monetary but also emotionally. In addition, some impacts are short-term while others last a lifetime. The economic model proves that crime rates are almost half of what they were in 1996 but the cost of keeping criminals increased gradually. While the direct effect of personal suffering from the victims of crimes and their families are unpredicted, there must be consideration of the serious economic costs of crimes to the U.S. Statistical facts show that violent crime rates are far higher than property crime rates (Figure 1). The cost of violent crimes is six times higher than property crimes. One of the reason may include the factors like expenses for keeping criminals in the incarceration for longer time which ultimate burden the tax payers. Gray (2014) stated that property crime rates in the U.S. do not differ significantly from other industrialized countries, such as the U.K. and Australia, the violent crime rate is significantly higher. Therefore, America has a serious violent crime problem. A significant amount of data and extensive analysis is used to design each theory and conclusion for this paper. In order to explain how specific conclusions were reached, a link between the dependent variable crime rates and independent variables such as unemployment, poverty, and education were analyzed. The results (OLS coefficients, t-values, t-tests, intercepts, the number of observations, and R^2) of these regression models for property crime rates and violent crime rates are listed below in Table 3. The results represent the positive relationship with poverty and negative relationship with education. Surprisingly, unemployment has no positive impacts on crime means, crime rate is not increased with increase in unemployment. The reason may include unemployment benefits provided by the government.

Table 3 Analysis of variance for the regression

Independent Variables	Multiple – property crimes	Multiple – violent crimes
UnemplRte (Unemployment rate)	-21.85 (-0.96)	-9.50 (-2.16)
PoveRte (Poverty rate)	79.97 (2.14)	17.73 (2.44)
EduRte (Education rate)	-206.37 (-19.87)	-28.34 (-14.04)
Intercept	8276.43	1096.12
Observations	20	20
R²	0.97	0.95

In order to test the hypothesis, it was determined that crime is a function of the aforementioned variable. The original regression model used three independent variables. Therefore, the results of correlation are as followed:

Table 4 Correlation *matrix of dependent and independent variable*

	ViolCrimRte	PropCrimRte	EduRte	PovtRte	UnemplRte
ViolCrimRte	1.0000	0.9832	-0.9655	-0.5491	-0.5814
PropCrimRte	0.9832	1.0000	-0.9823	-0.5478	-0.5373
EduRte	-0.9655	-0.9823	1.0000	0.6255	0.5762
PovtRte	-0.5491	-0.5478	0.6255	1.0000	0.8242
UnemplRte	-0.5814	-0.5373	0.5762	0.8242	1.0000

The matrix represents relationship between dependent variable – violent crime rates (ViolCrimRte) and property crime rates (PropCrimRte) versus independent variables – education rates (EduRte), poverty rates (PovtRte), and unemployment rates (UnemlRte).

4.1 Multiple Regression Model for Property Crime Rates

Results from the multiple regression analysis show effects of unemployment, poverty, and education on property crime rates between years 1996 to 2015 (n=20). The following equation shows estimated effects of independent variables on property crimes.

PropCrimRte: 8276.43-218.5(UnemplRte)+ 799.4(PovtRte)-206.4(EduRte)+ μ

Surprisingly, a one percentage point increase in the unemployment will decrease the property crime rates by 218.5 per 100,000 inhabitants. A one percentage point increase in higher education will decrease the property crime rate by 206.4 per 100,000 inhabitants. A percentage increase in poverty will increase property crimes by 799.4 per 100,000 inhabitants.

4.2 Multiple Regression Model for Violent Crime Rates

Results from the multiple regression analysis show effects of unemployment, poverty, and education on violent crime rates between years 1996 to 2015 (n=20). The following equation shows estimated effects of independent variables on violent crimes.

ViolCrimRte: 1096.12-9.51(UnemplRte)+ 17.73(PovtRte)-28.35(EduRte)+ μ

Surprisingly, a one percentage point increase in the unemployment will decrease the property crime by 21.85 and violent crime rates by 9.51 per 100,000 inhabitants. A one percentage point increase in higher education will decrease the violent crime rate by 28.35 per 100,000 inhabitants. A percentage increase in poverty will increase violent crimes by 17.73 per 100,000 inhabitants. Thus, a one percent increase in the poverty will increase property crime rates by 799.4 and violent crime rates by 17.73 per 100,000 inhabitants. Moreover, a one percent increase in the higher education will decrease property crime rates by 206.4 and violent crime rates by 28.35 per 100,000 inhabitants.

4.3 Impact of Education

The statistical model showed that 1% point increase in education will decrease crime rates by 0.23%. The reason includes reforming school climates keep students engaged in a way that will lead students away from crime and prison. Lower educational execution is directly associated with increased arrest and incarceration rates. According to a survey (DeBaun& Roc, 2013), the nation spends an average of $12,643 a year to educate a student whereas the annual cost per inmate is $28,323. There are high impacts of education on crime costs. Findings of Alliance report (DeBaun& Roc, 2013) claim that the USA can save as much as $18.5 billion in annual crime costs if the high school male graduation rate increased by only 5 percentage points.

4.4 Impacts of Unemployment

The unemployment rate is one of the best indicators to evaluate the economy. Unemployment is a dangerous state of the U.S. economy. When unemployment is higher, states will increase their taxation on businesses that become more expensive to the companies to retain or hire new workers. Over 70% of the U.S. economy produce goes to personal consumptions and unemployed workers (Simpson, 2011). In the present statistical model, unemployment has no negative impacts on crime; rather it was observed that increased unemployment will decrease crime rates to the certain level. The reasons may include, state and federal government pay a price for unemployment benefits, food assistance, and Medicaid.

4.5 Impacts of Poverty

Official crime rates are higher amongst the poor. People living under the poverty line are more likely arrested and convicted for a wider variety of offenses. Certain studies support a positive relationship between poverty (absolute or relative) and property crime. The examination of the National Crime Victimization survey revealed that crime has increasingly become concentrated in poor neighborhood in the United States. Some early studies found that poverty was main factor explaining variations in crime rates because level of absolute poverty with annual income below $5000 are significantly associated with higher rates of violent crimes (Webster and Kingston, 2014). The linkages between poverty and crime seem to be based on the argument that people who have less will want to take from those who have more. In the United States, the highest crime rates were reported in Detroit, Michigan. 2,072/100,000 people because 38.1% of their population lives below the poverty line (Ajimotokin, Haskins, & Wade, 2015). Present statistical analysis showed that 1% point increase in poverty will increase crime rates by 0.83%. Thus, outcomes of the present statistical analysis found consistent with earlier claims.

V. CONCLUSION

The increased crime rates representdecreased safety of people and business adventures. There is a common conception that irregularities in the business cycle leads to higher crime rates. Moreover, positive correlations exist between the amounts of income inequality and crime rates. Higher education is a factor which may be used to fight against crime. When education increases, the level of unemployment will reduce and will help curb poverty. Understanding the relationship between unemployment, poverty, and education rates will allow policymakers to plan the most effective way to make the USA, as a whole, a safe place to live. The ability to lower crime rates nationwide will bring many business advantages such as an increase in domestic and foreign investment. It will increase societal value by improving the quality of life, as well as a reduction in inequality.

REFERENCES

[1].　Ajimotokin, S., Haskins, A., & Wade, Z. (2015, April 14). The effects of unemployment in the crime rates in the U.S. Retrieved from https://smartech.gatech.edu/bitstream/handle/1853/53294/theeffectsofunemploymentoncimerates.pdf.

[2].　Bureau of Labor Statistics (2017). The unemployment rate in the United States from 1990 to 2016. https://www-statista-com.nuls.idm.oclc.org/statistics/193290/unemployment-rate-in-the-usa-since-1990/

[3].　Fadaei, R. (1989). The cost of crimes: Unemployment and poverty.*International Journal of Social Economics.* 16 (12), 34-43.

[4].　NIBRS(2017,January18).NIBRScrimetypes.　　　　　　　　　　　　　　　Retrieved fromhttps://www.denvergov.org/media/gis/DataCatalog/crime/pdf/NIBRS_Crime_Types.pdf.

[5].　DeBaun, B., & Roc, M., 2013. Saving future, saving dollars: The impact of education on crime reduction and earning. *Alliance for Excellent Education*. Retrieved from https://assets.documentcloud.org/documents/786361/savingfutures.pdf.

[6].　Gray, A.J. (2014). *An analysis of state gun control laws and their effect on violent crimes* (Master's thesis). Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.1027.329&rep=rep1&type=pdf

[7].　Simpson,S.D.(2011,August 09). The cost of unemployment to the economy. Retrieved from http://www.investopedia.com/financial-edge/0811/the-cost-of-unemployment-to-the-economy.aspx.

[8].　Webster,C.andKingston,S.(2014,May01).Povertyandcrimereview.Retrievedfrom http://eprints.lancs.ac.uk/71188/1/JRF_Final_Poverty_and_Crime_Review_May_2014.pdf.