# The Relationship Between Poverty and Crime:
# A Cross Section Analysis

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**Abstract:**

This paper compares the crime rates, poverty rates, and other economic statistics to determine if there is a relationship amongst the variables. The highest crime rates per capita in the world exist in developing countries; these countries also have very high rates of poverty. Is it a coincidence, or is there actually some substance to these facts? Crime is a complicated issue, and other variables like education, healthcare, and housing have to be taken into consideration. The results indicate that there is a relationship between certain types of crime and poverty, and that income inequality is significant to all types of crime.

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**1.0 INTRODUCTION**

Crime and poverty are prevalent issues in countries all around the world. Poverty has hindered the ability of developing countries to reach their potential. Crime has played a similar role in the development of these nations. However, these are not just issues for poor countries; OECD (Organization for Economic Co-operation and Development) countries still have high rates of crime. The United States has an unusually high homicide rate for one of the most economically prosperous nations. For such a rich and educated country, the homicide rate is extremely high. But, for the most part the highest rates of crime come from developing areas such as Africa and South America.

There is a variety of ways to compare poverty from country to country. This study looks at three key variables. The first is what percentage of the country's population is living on less than $1.25 GDP PPP (Gross Domestic Product Purchasing Power Parity Adjusted). A second measure is what percentage of the population is living below the national poverty line. Water quality is a third way to quantify a country's poverty levels. Poorer countries have lower quality water compared to more developed nations. Education is also an important variable in this equation as richer countries have much higher levels of human capital. Also, increasing education could have an adverse effect on crime rates. A smarter population could mean a decrease in crime rates.

The UNODC (United Nations On Drugs and Crime) publishes a compilation of crime and drug rates for most countries. This list includes homicide, robbery, theft, burglary, rape, and total crime rates. These statistics will serve as the dependent variable in this model, but there are still other variables that must be considered when analyzing crime. For instance, high rates of

crime are found within high areas of urbanization or population density. The closer people live together, the more opportunities for crime.

Ultimately, the goal is to see if there is a connection between the two variables, crime and poverty. It can be hypothesized that a relationship exists, but to use regression and see if one exists is where the real value is. There have been other studies that looked into this topic but they focused on specific countries rather than the entire world. Taylor (2006) compared levels of poverty with regards to crime in the United States; Anderson (2007) did a similar study with an index of crimes in South Africa using a time series model. This study differs because it uses cross section data for over a hundred different countries and because it uses different variables.

The rest of the paper is divided into the following sections: Section 2 discusses the current trends relating to the issue; section three gives a literature review of the topic; section four covers data, empirical methodology, and the empirical model; section five presents the empirical results; section six concludes the relationship between poverty and crime.

## 2.0 TREND

Figure 1 shows what percent of each country's population is living on less than $1 a day. Most of the data is focused in Africa, South America, and Southeast Asia. Most African countries have more than 20% of their population living on less than a dollar a day. However, there are also large grey areas in Central Africa, which signifies that the data is unknown; it is most likely not calculated by the government in those countries. In South America and Southeast Asia between 6% and 20% of the population are living on a dollar a day. This is important because this model hopes to measure the impact of poverty on different crimes. What portion of the population living below $1 a day is a good barometer for poverty.

**Figure 1: Percent of Population Living Under $1/Day by Country**
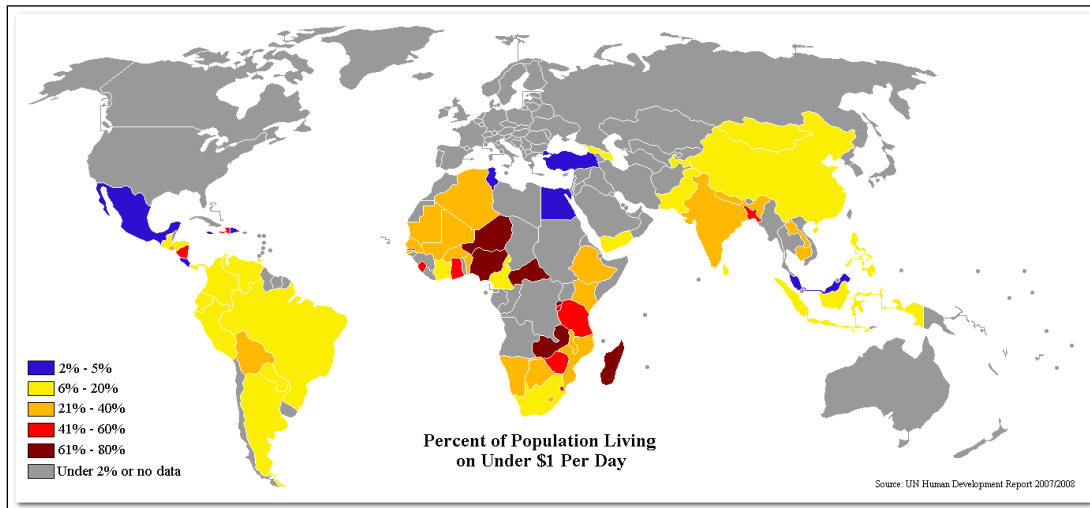


Source: UN Development Report 2007/2008

Figure 2 shows how poverty has changed in developing countries over a twenty-five year period. This is very similar to the figure above, but it shows the changes over time, instead of the levels in one year. It also breaks down the data differently by including multiple dollar amounts per day. Overall, there has been a decrease in poverty, but the rates are still high. Developing countries still have 50% of their population living on $2 per day.

**Figure 2: Percentage Living Below Various Standards 1981-2005**
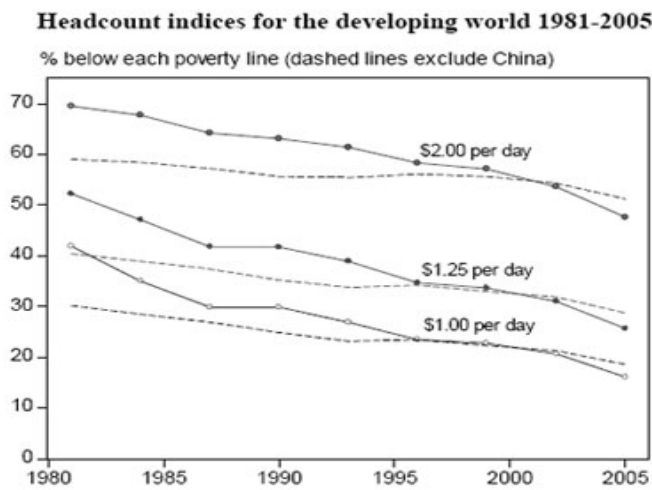


Source: World Bank

Figure 3 shows the percent of the population living below the poverty rate by region, as well as the raw numbers. This data is similar to the line graph above, but it divides the data by region, and predicts how poverty is going to change over the next five years. The good sign is that rates have been going down, and they are predicted to keep doing so.

**Figure 3: Poverty Rate and Total Numbers by Region**

| TABLE 1: REGIONAL AND GLOBAL POVERTY, 2005, 2010, 2015 | | | | | | |
|---|---|---|---|---|---|---|
| | Number of poor (millions) | | | Poverty rate (% population | | |
| | 2005 | 2010 | 2015 | 2005 | 2010 | 2015 |
| East Asia | 304.5 | 140.4 | 53.4 | 16.8% | 7.4% | 2.7% |
| Europe and Central Asia | 16.0 | 8.4 | 4.3 | 3.4% | 1.8% | 0.9% |
| Latin America and Caribbean | 45.0 | 35.0 | 27.3 | 8.4% | 6.2% | 4.5% |
| Middle East and North Africa | 9.4 | 6.7 | 5.4 | 3.8% | 2.5% | 1.9% |
| South Asia | 583.4 | 317.9 | 145.2 | 40.2% | 20.3% | 8.7% |
| Sub-Saharan Africa | 379.5 | 369.9 | 349.9 | 54.5% | 46.9% | 39.3% |
| World | 1,337.8 | 878.2 | 585.5 | 25.7% | 15.8% | 9.9% |

Source: Authors' calculations

Source: UN Development Report 2010

Figure 4 depicts the homicide rate by each country. This data is structurally similar to the first figure. While Africa and South America have very high rates, Southeast Asia is not as relevant as it has been in other graphs. Also, unlike with the other statistics, developed countries like the United States and Russia have comparable rates with the developing world. Homicide is one the dependent variables in the model; the whole point of this regression is to see how poverty affects crime. If poverty rates go up, do crime rates go up as well?

**Figure 4: Homicide Rate by Country**
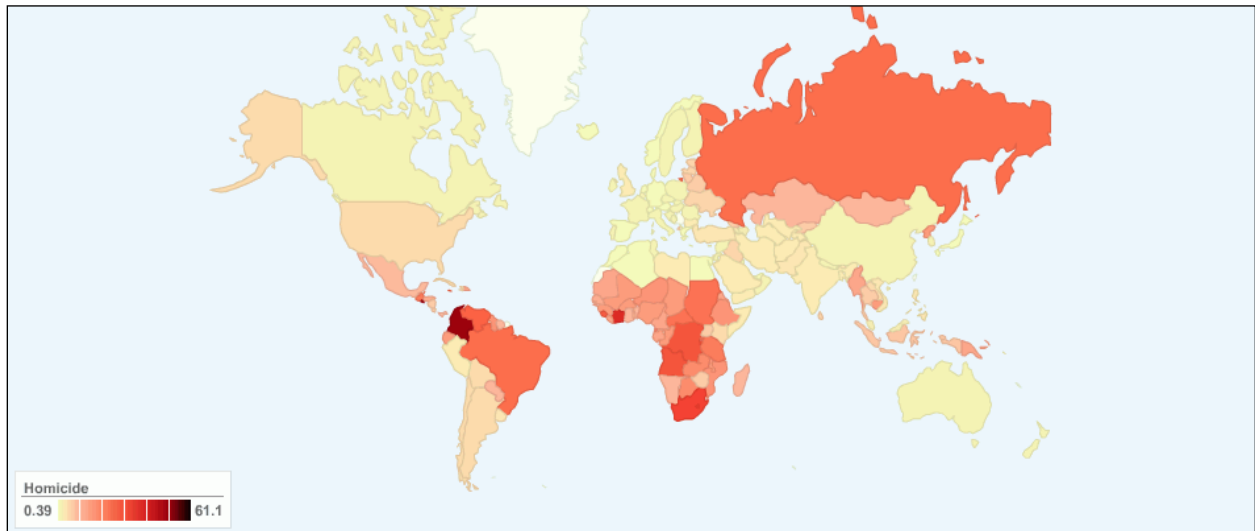


Source: United Nations Development Report 2008

Figure 5 displays what percentage of each country that does not have access to clean drinking water. Once again, the data is located primarily in Africa, South America, and Southeast Asia. The highest rates occur in Central Africa, in countries like the Congo, Chad, and the Central African Republic. Access to clean water is an important variable in this model. The regression is supposed to compare rates of poverty to rates of crime. Measuring access to clean water is one of the best barometers for poverty

**Figure 5: Population Without Access to Safe Water**
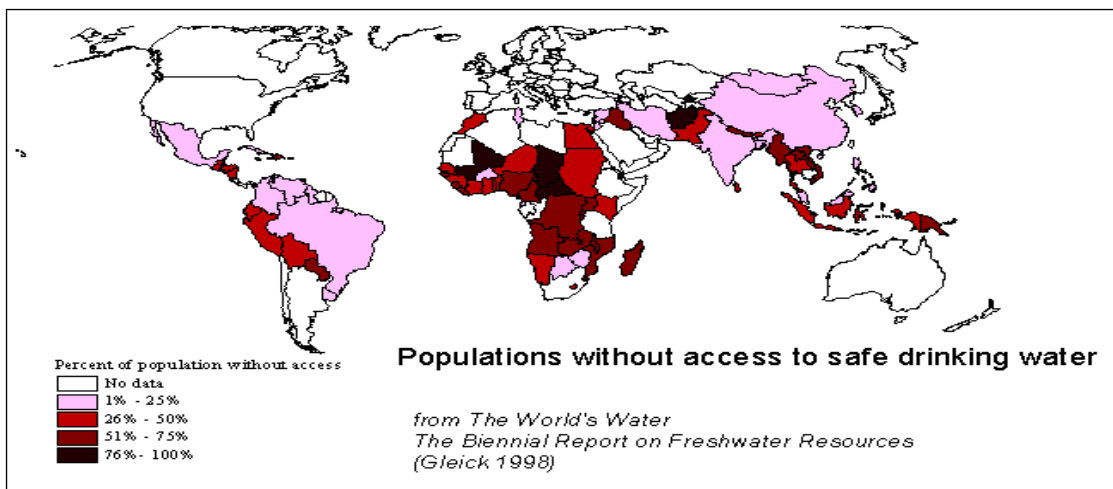


Source: Biennial Report 1998

**3.0 LITERATURE REVIEW**

Poverty and crime have been issues in society since civilization began. They are also both issues that can be reduced, but never eradicated. Poverty and crime will always exist in the world, but the effects of them can certainly be minimized. There have been great efforts made to reduce poverty worldwide, and they have been generally successful. While there are still high rates of poverty worldwide, the numbers have been declining over the last twenty years. Crime rates have also been generally falling over that same time period.

There has been a great deal of research into this subject. An analysis of Iran over a nine year period concluded that there was a relationship between certain crimes, but not all crimes (Haddad and Moghadam 2010). Their study looked at property crimes, homicide, and burglaries. They concluded that economic and social conditions have an impact on burglaries, but they cannot explain homicide rates. This is an important study because it shows that a relationship exists between poverty and crime in a developing nation.

A similar study was conducted using Eritrea as a source of data. Eyob and Harris (2004), analyzed various determinants of poverty, and came back with conclusive results. The paper used a DOGEV model which was adapted from a dogit model. Poverty was the dependent variable, and their model included descriptive statistics such as religion, education, labor, region, and family. The results varied for each explanatory statistic; labor force statistics were generally split with their impact on poverty. Education also yielded similar results, lower education levels were positively related, and higher education levels were negatively related. Religion had a negative impact on poverty. Overall this regression is useful, but there are still some important questions to be asked. This relationship exists in the developing world, but does it exist worldwide. Do higher income countries return the same results?

This relationship of poverty and crime also exists in South Africa (Anderson 2007). Crime was the dependent variable, which was indexed with various types of crimes. This included murder, rape, robbery, assault, and abduction. The independent variables were household statistics as well as monthly expenditures. If these numbers are low, there is definitely an implication of poverty. The final results from the regression were that crime and poverty are positively related. As rates of poverty increase, so do the rates of crime. The conclusion of the paper is that as South Africa becomes more affluent, the number of robberies could increase because more opportunities exist.

However, this is not just a problem affecting developing countries; poverty has an impact on crime in high income countries such as the United States (Taylor 2006). This paper included four different models; the first two were very basic and the third and fourth were more complex. The first model had total crime as the dependent variable and had poverty as its explanatory variable. The second model was similar, except that violent crime was substituted for total crime. The end result was that poverty had a positive effect on total and violent crime. This is just to establish a simple connection between the two statistics. However, these models did not include other variables, which mean that the regressions suffered from an omitted variable bias. There is more that goes into crime than just poverty. Later on, the models are expanded to include unemployment, population density, geographic location, and demographics. The results were generally favorable. Poverty and population density were both positively correlated with both total and violent crime. Unemployment was negatively correlated to violent and total crime, which is not unusual; there is no conclusive evidence for a correlation between unemployment and crime. Some studies show a positive relationship while others show a negative relationship. Finally, the results varied between region and race for both types of crime.

Some studies focused on the developed world, while others focused on the developing world; does this connection still exist for the entire world.

Brush (2007), analyzes income inequality in America using both a time series model and cross section data. The results indicated that income inequality is positively correlated with crime in the cross section analysis, but negatively correlated with the time series data. This model included the GINI coefficient, population, population density, unemployment, demographic, and income percentages. Once again, the fact that these results came back both significant and positive is important. Using the GINI coefficient is just one way to measure poverty. If a country has high income inequality than it also has a significant portion of its population impoverished. This study uses the GINI index as one of the independent variables. It will be interesting to see if the results return the same.

Mehlum et al. (2006), wrote about the effects of poverty and crime in 19th century Bavaria. Their model focused more on agriculture as a determinant of poverty; they used rainfall and rye prices as variables in their model. They wanted to see how a change in rye prices would affect the crime rates. Back then, rye played a more significant role in their society than it does in a more contemporary setting. The end results were that when the price of rye increased, the rate of property crime increased as well. This indicates a positive relationship between property crime and inflation for this time period. When a person's real wages decrease they are more likely to commit certain crimes. As real wages go down, poverty increases; society as a whole has less money for goods such as bread.

## 4.0 DATA AND EMPIRACAL METHODOLOGY

### 4.1 Data

The study uses cross sectional data for the year 2010. Data was obtained from the 2010 Human Development Report, the World Bank, Gallup World Polls, and the UNODC. A summary of the variables, their descriptions, expected signs, and significance is included in appendices A and B; a table of summary statistics is provided for the data in Table 1 at the end of this paper.

### 4.2 Empirical Model

This study uses and modifies Eyob and Harris (2004), Taylor (2006), and Brush (2007). I have included the variables COMM, SAFE, NATP, and AIRQ. The model could be written as the following:

$$ASSLT = \beta_0 - \beta_1 SAFE + \beta_2 COMM + \beta_3 HOUS - \beta_4 HEAL - \beta_5 EDUC - \beta_6 AIRQ - \beta_7 WATQ + \beta_8 GINI + \beta_9 LFPR + \beta_{10} NATP + \beta_{11} POVE + \varepsilon$$

$$ROBB = \beta_0 - \beta_1 SAFE + \beta_2 COMM + \beta_3 HOUS - \beta_4 HEAL - \beta_5 EDUC - \beta_6 AIRQ - \beta_7 WATQ + \beta_8 GINI + \beta_9 LFPR + \beta_{10} NATP + \beta_{11} POVE + \varepsilon$$

$$HOMI = \beta_0 - \beta_1 SAFE + \beta_2 COMM + \beta_3 HOUS - \beta_4 HEAL - \beta_5 EDUC - \beta_6 AIRQ - \beta_7 WATQ + \beta_8 GINI + \beta_9 LFPR + \beta_{10} NATP + \beta_{11} POVE + \varepsilon$$

The dependent variable in this study is crime. There are three different types of crime analyzed in this paper; they are robbery, assault, and homicide. Robbery and homicide are measured per 100,000 people, and assault is a percentage of the population that has reported an assault.

There are eleven independent variables included in this study. SAFE measures the perception of safety for the population. This number is derived from a simple survey question, *do you feel safe walking alone at night?* The number that answered yes represents the

percentage value for the variable SAFE. HEAL deals with the overall rating of hospitals and health in each country. This takes into consideration factors like availability and quality of healthcare. HOUS measures how available affordable housing is for the population. EDUC is the quality of schooling and the overall education system within each given country. This deals with statistics like student teacher ratio and graduation rates. AIRQ measures the quality of air within each country; this would take into account factors like pollution and industrialization. WATQ is how drinkable and useable the water supply is for the population of each country in the study. COMM looks at the value of society's population. This is an index that includes factors like public services, parks, and recreation; it also measures the quality of the neighborhoods. SAFE, HEAL, HOUS, EDUC, AIRQ, WATQ, and COMM are all measured on a scale from one to a hundred, with a hundred being the ideal score. POVE is a variable for how poor a country is; it is the portion of the population living below $1.25 GDP PPP per day. LN_POVE is just the log form of the variable POVE. NATP is the percentage of the population living below the national poverty line within each country. GINI is an index for income inequality for each country. It measures how evenly income is distributed amongst the population. LFPR is the labor force participation rate for the male population in each country. This is the employed plus unemployed divided by the male population. It is a different labor statistic because unemployment rates are not available for every country in the HDR Report.

**5.0 EMPIRICAL RESULS**

The tables at the end of the paper include the regression results for each different type of crime. ROBB was run multiple times with different combinations of independent variables. SAFE, HOUS, and EDUC are all statistically significant at some level in the first model. WATQ is not statistically significant at any level in this regression indicating that there is no relationship

between water quality and crime.  However, the variable GINI is relevant at the five percent level with a coefficient of 8.033.  This means that when the GINI index increases by one, there are eight more robberies per one hundred thousand people.  This implies that income inequality and poverty are highly correlated.  Also, the $R^2$ statistic is .4511; overall the variables have a strong relationship.  The F statistic is also significant at all three levels.

In the second regression, SAFE, HOUS, COMM, and EDUC are all significant at some level however, WATQ and AIRQ are not.  LFPR is meaningful at the five percent level.  The coefficient for LFPR is 9.86; this indicates that when the LFPR increases by one, there are almost ten more robberies per one hundred thousand people.  This result may seem off at first because if the LFPR is increasing, that means for the most part a society is becoming wealthier.  However, with more people working, there are more opportunities to commit crime, in this case robberies.  This model has an $R^2$ of .4371 and an F statistic significant at all levels.

Finally, in the third regression SAFE, is the only variable significant.  NATP and POVE are not relevant at any level; this means that no relationship exists between robbery and levels of poverty.  This model has a high $R^2$, but an F statistic not significant at any levels.

The coefficients for ASSLT returned the most important results.  The first regression shows that SAFE, COMM, HEAL, and the constant are all relevant at some level.  Once again, the GINI index is significant at the one percent level.  The estimated coefficient is .292, which seems low, but the dependent variable ASSLT is measured in percentage form.  This number means that when the GINI index increases by one, assault increases by .29%.  Once again, crime and income inequality are highly correlated.  This model has an F statistic significant at all levels and an $R^2$ of .5953.

The second regression indicates that SAFE and COMM are significant at some level. The $R^2$ is .4538 and the F statistic is significant at the one percent level. Similar to robbery, LFPR is significant at the one percent level with regards to assault. The estimated coefficient is .21; this means when the LFPR goes up by one, assault increases by .21%.

The third regression has SAFE, HEAL, and the constant significant at some level. More importantly, the variable NATP is significant at the ten percent level. The estimated coefficient is .08, showing a positive relationship between assault and poverty. When the national poverty rate increases, assault goes up by .08%. This model also has an F statistic significant at all levels and an $R^2$ of .4655. The fourth model has the constant, SAFE, HEAL, and COMM relevant at some level. The $R^2$ is .3898 and the F statistic is significant at the one percent level. The variable Log (POVE) is significant at the ten percent level and has a positive relationship with assault; when the number of people living on less than $1.25 GDP PPP per day increases, the percentage of assaults increases as well. Water and air quality are not meaningful at any level with relation to assault. This indicates that there is no relationship between these variables.

The results for HOMI did not yield as important of results. The results from the first regression indicated that only SAFE and GINI are significant variables in the first model. GINI has a coefficient of .477 and is significant at the one percent level. This shows a positive relationship between homicide and income inequality; when the GINI index increases by one, homicide rates go up by .477 per one hundred thousand people. The F statistic is significant at the one percent level and the $R^2$ is .4218. The second model only yielded SAFE as a significant variable. This shows there is no relationship between LFPR and homicide rates. Similarly, in the third model, SAFE is the only significant variable. This signifies no relationship between levels of poverty and homicide rates.

**6.0 CONCLUSION**

In summary, there are links between poverty and certain types of crimes. Income inequality is positively related to all three types of crime. As money is distributed more evenly, all three types of crime should decrease. Assault returned the best results because POVE and NATP are both positively related to assault. This shows that a relationship exists between poverty and assault. Water quality was not significant in any of the regressions. This indicates that the cleanliness of water does not impact crime. This also shows that water quality as a proxy for poverty does not return meaningful results. There are better ways of measuring poverty. As with other studies, there is not meaningful relationship between poverty and homicide. The only variable significantly related to homicide is the GINI index. Also, SAFE is the only variable that is noteworthy amongst all ten models. This shows that people perceptions of safety are usually correct. If you feel safer, most likely you will not experience any of these crimes.

One issue going forward is the lack of data. This type of analysis could be better served in a time series model or a panel data. Recently the UNODC has been reporting crime rates for developing countries; however, not enough exists for a significant study. Over time more data will become available, but as of right now, not enough exists.

**Table 1: Summary Statistics**

| Variable | Observations | Mean | Std. Dev. | Minimum | Maximum |
|---|---|---|---|---|---|
| HOMI | 139 | 7.390648 | 11.87643 | 0 | 60.9 |
| ROBB | 95 | 116.8654 | 247.1496 | .529883 | 1836.82 |
| ASSLT | 145 | 7.896552 | 6.518909 | 0 | 38 |
| SAFE | 145 | 58.97931 | 16.51576 | 20 | 98 |
| COMM | 86 | 62 | 10.53906 | 34.6 | 89.4 |
| HOUS | 144 | 46.29861 | 14.83903 | 0 | 87 |
| HEAL | 144 | 55.8125 | 20.16678 | 13 | 93 |
| EDUC | 144 | 62.15278 | 15.80799 | 0 | 98 |
| AIRQ | 145 | 73.75862 | 11.64956 | 37 | 97 |
| WATQ | 146 | 67.38356 | 17.23159 | 28 | 99 |
| GINI | 145 | 40.78552 | 9.460356 | 16.8 | 74.3 |
| LFPR | 164 | 80.51037 | 6.466693 | 50.4 | 94 |
| NATP | 101 | 32.64535 | 30.52668 | 0 | 92.69 |
| Log (POVE) | 106 | 2.458546 | 1.406813 | .6931472 | 4.483003 |
| POVE | 106 | 25.21038 | 25.2297 | 2 | 88.5 |

## Table 2: Regression Results

| | Assault | | | |
|---|---|---|---|---|
| | I | II | III | IV |
| Constant | 10.28114** (4.90411) | 9.631968 (7.853052) | 24.4773*** (5.677711) | 23.20685*** (6.199347) |
| SAFE | -.1054073*** (.0286671) | -.1653884*** (.0292754) | -.1850297*** (.0353098) | -.1791665*** (.0375338) |
| COMM | -.3632366** (.1761949) | -.388055* (.1969253) | -.2803488 (.26128) | -.4368966* (.2535849) |
| HOUS | .0220315 (.0430438) | .0207668 (.0485247) | .0157093 (.0587641) | .0420041 (.0635801) |
| HEAL | .1110699* (.06077320 | .086976 (.0655538) | .1611437* (.0807381) | .153212* (.0898204) |
| EDUC | .0422368 (.0511945) | .0763089 (.0569495) | -.014419 (.0769993) | .0299297 (.0806662) |
| AIRQ | .053798 (.0554691) | .0346809 (.0563289) | -.092766 (.1134707) | -.0087758 (.0966908) |
| WATQ | -.0013487 (.0619389) | .019334 (.067955) | .116663 (.078201) | .1095922 (.0832467) |
| GINI | .2926311*** (.0534108) | | | |
| LFPR | | .2106046*** (.0892433) | | |
| NATP | | | .0782522* (.0390663) | |
| Log (POVE) | | | | 1.340838* (.6971527) |
| $R^2$ | .5953 | .4538 | .4655 | .3898 |
| F Statistic | 12.5*** | 7.89*** | 5.12*** | 4.23*** |
| Observations | 77 | 85 | 56 | 62 |

|  | Robbery | | |
|---|---|---|---|
|  | I | II | III |
| Constant | -103.5458 (307.6216) | -462.2799 (402.8448) | 39.82489 (454.912) |
| SAFE | -4.129576* (2.195023) | -5.950745*** (1.749628) | -8.042735** (2.876952) |
| COMM | 18.99679 (11.35626) | 19.20229* (10.14394) | 31.02383 (20.53737) |
| HOUS | -8.604939*** (2.640958) | -8.920882*** (2.501464) | -5.392662 (5.488259) |
| HEAL | 6.051176 (3.963249) | 5.0092 (3.499924) | 3.975864 (6.21063) |
| EDUC | -9.701803** (3.682551) | -8.507304** (3.321397 | -11.81332 (6.802798) |
| AIRQ | -.9326913 (3.657305) | -1.612885 (3.533685) | -5.859999 (7.409975) |
| WATQ | -4.32484 (3.83146) | -3.938498 (3.657679) | -2.404398 (4.910098) |
| GINI | 8.033183** (3.53682) |  |  |
| LFPR |  | 9.860344** (4.730499) |  |
| NATP |  |  | 5.157997 (5.01131) |
| POVE |  |  | -5.540308 (6.109862) |
| $R^2$ | .4511 | .4371 | .4650 |
| F Statistic | 4.11*** | 4.37*** | 1.64 |
| Observations | 49 | 54 | 27 |

|  | Homicide | | |
|---|---|---|---|
|  | I | II | III |
| Constant | -8.332646 (15.09592) | -4.796947 (20.43894) | 11.80626 (17.31412) |
| SAFE | -.3083431*** (.0974719) | -.4424583*** (.0856385) | -.4421361*** (.121831) |
| COMM | .6935292 (.5212585) | .5636105 (.517675) | .8826751 (.7854068) |
| HOUS | -.0558784 (.1280715) | -.0470014 (.1274559) | .0024182 (.1895058) |
| HEAL | -.0941689 (.1819495) | -.0770615 (.1732955) | -.0872202 (.2638833) |
| EDUC | .0826241 (.1609058) | .15211321 (.1585351) | -.0229337 (.2693756) |
| AIRQ | -.0749681 (.1759915) | -.0647907 (.156068) | -.3293828 (.3329904) |
| WATQ | -.2932721 (.184882) | -.2507043 (.1838239) | -.043941 (.2322039) |
| GINI | .4773451*** (.1702785) |  |  |
| LFPR |  | .2740271 (.2347329) |  |
| NATP |  |  | .0342336 (.1523095) |
| POVE |  |  | .0502753 (.1594199) |
| $R^2$ | .4218 | .3693 | .3309 |
| F Statistic | 5.65*** | 4.98*** | 2.03* |
| Observations | 71 | 77 | 47 |

Note: ***, **, and * denotes significance at the 1%, 5%, and 10% level respectively.  Standard errors in parenthesis.

# Appendix A: Variable Description and Data Source

| Acronym | Description | Data Source |
|---|---|---|
| HOMI | Homicide rates by country per 100,000 people | UNODC 2006-09 |
| ROBB | Robbery rates by country per 100,000 people | UNODC 2006-09 |
| ASSLT | Percentage of the population that has reported an incident of assault | Gallup World Polls 2006-09 |
| SAFE | Population was asked do you feel safe walking alone at night, the portion that answered yes is this number | Gallup World Polls 2006-09 |
| COMM | The overall quality of the community within a country. Would include combination of housing, recreation, and education | Gallup World Polls 2006-09 |
| HOUS | What is the availability of affordable housing in each country based on a scale of 1 to 100; 100 being the best education in the world | Gallup World Polls 2006-09 |
| HEAL | The overall quality of each country's healthcare system. On a scale of 1 to 100 | Gallup World Polls 2006-09 |
| EDUC | The quality of the education system; on a scale of 1 to 100 | Gallup World Polls 2006-09 |
| AIRQ | How safe the water is to use on a scale of 1 to 100, with a 100 being the best possible score | Gallup World Polls 2006-09 |
| WATQ | The quality of the air within a given country. | Gallup World Polls 2006-09 |
| GINI | Income inequality statistic; measured 1 to 100, 1 being perfect equality | HDR 2010 |
| LFPR | Labor force participation rate for men; employed and unemployed men over male population | HDR 2010 |
| NATP | The ratio of people living below the national poverty line | World Bank 2010 |
| POVE | What percentage of a population is living below $1.25 GDP PPP per day | World Bank 2010 |
| Log (Poverty) | The log form of the variable Poverty | World Bank 2010 |

## Appendix B: Variables and Expected Signs

| Acronym | Variable Description | What it captures | Expected Sign |
|---|---|---|---|
| SAFE | Yes or no question: do you feel safe walking home at night? | The level of safety within each country | - |
| COMM | The quality of life in each country | The strength of each society | +/- |
| HOUS | Availability of affordable housing | How affluent a society is; how | +/- |
| HEAL | The quality of the healthcare system for each country | The strength of hospitals and the medical system | +/- |
| EDUC | The education system in each country | Human capital for each country | - |
| AIRQ | How safe is the air supply for each country | A measure of pollution as well as poverty | - |
| WATQ | How usable and drinkable is the water supply | A measure of poverty and pollution | - |
| GINI | Income inequality | How income in distributed amongst countries | + |
| LFPR | Unemployment + Employment of men divided by male population | What percentage of the country is interested in working | +/- |
| NATP | Portion of population living below national poverty line | A measure of poverty for each country | + |
| POVE | How many people live on less than $1.25 GDP PPP | A measure of poverty for each country | + |
| Log (POVE) | The log form of the variable poverty | The percentage impact of poverty on crime | + |

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