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# **Is Crime a Barrier Against Financial Development?**

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# **Is Crime a Barrier Against Financial Development?**

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## **Abstract**

Using cross-country data, this paper analyzes the relationship between crime rates and their effects on financial development at the national level. To do this, I take several financial variables and compare them with three main crime variables- homicide, fraud, and corruption- and plot significant correlations to analyze trends. The results show that while fraud and corruption have no adverse effects on financial development variables, they are positively correlated with several of them, and intentional homicide is quite detrimental to countries' financial development.

**JEL Codes:** G10; G20; K00

**Keywords:** Financial development; crime; cross-country data

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## 1. Introduction

In recent discussions of financial development issues in different countries worldwide, a controversial issue has been the role crime plays in development. On the one hand, some believe crime and development have no correlation with each other and operate independently. On the other hand, some believe crime directly affects financial development, often negatively.

In this paper, I attempt to analyze the relationship between crime rates and financial development in countries worldwide. The three crime variables used are intentional homicide victims, fraud, and corruption. All these crime variables are taken in terms of rate per 100,000 individuals. The financial development variables used are as follows: bank accounts per 100,000 adults; credit card ownership (% age 15+); debit card ownership (% age 15+); financial system deposits to GDP (%); Private credit by deposit money banks and other financial institutions to GDP (%); domestic credit to private sector (% of GDP); stock market capitalization to GDP (%); Stock market total value traded to GDP (%); bank lending deposit spread; bank deposits to GDP (%).

This range of variables allows for a comprehensive view of a country's financial development and situation. Any one variable can be skewed for a variety of reasons; for example, corporations can disproportionately influence stock market capitalization to GDP (%) when the country or region could be lacking in other key financial development areas. Thus, the use of all the variables together accounts for most outliers.

My paper is related to several other pieces of research in the existing literature. For example, Bonaccorsi di Patti (2009) analyzes the relationship between the terms on bank loans and crime rates by investigating over 300,000 bank-firm relationships. She shows that bank borrowers consequently pay higher interest rates in higher crime areas and resort to more credit-based loans than in low-crime areas. Furthermore, Barua and Mahesh (2018) find that financial development significantly impacts crime, primarily through income inequality. This paper, however, also finds that, at least at the start, financial development *increases* crime, citing industrialization, migration, and development as possible causes for nonviolent crimes. Nevertheless, income inequality "pressurizes" individuals to commit crimes which, in theory, would allow them to close the gap and increase wealth. Another aspect to consider is countries' social capital and financial development. In areas with high levels of social capital, households

invest a larger proportion of their wealth in stocks as opposed to direct cash. As social capital decreases, the likelihood of receiving a loan from a friend or relative decreases as well (Guiso, Sapienza, Zingales 2004). This is meaningful because social capital would theoretically decrease in areas with higher crime rates, as trust between community members would go down.

While most papers in the literature analyze the effects of financial development on crime, I attempt to recognize the inverse relationship: the impact of crime rates on financial development. Furthermore, while some papers focus on one country, such as Nigeria (Oladapo, Zainab Ajoke 2014), I seek out data from various countries to establish clear trends between the variables. Additionally, most papers in the existing literature tend to focus on economic and/or nonviolent crime. In contrast, I incorporate violent crime using intentional homicide rates and their impact on select variables.

The rest of the paper is organized as follows. In the next section, I discuss the conceptual framework where I present possible connections between financial development and crime, as well as the reasons the two may or may not be connected and/or dependent on one another. Then, in Section 3, I present my data and its sources as well as introduce tables, graphs, and charts. Section 4 discusses the empirical methodology, further exemplified by scatter plots and correlations. Next, Section 5 presents the results of the empirical analysis, including what I found because of the data. The last section will conclude the paper.

## **2. Conceptual Framework**

The consequences of crime on financial development are extensive. At its most basic level, fear-based market trends reflected by increased volatility are influenced by increased crime in an area. Banks naturally would try to lend less money to individuals in higher crime areas because of the increased risk in their loans. Regarding market behavior, an increase in risk leads to less volume of trades which slows down the financial development of a country.

Another aspect to consider is the spiraling nature of the relationship between crime and financial development. Take, for example, a high crime area versus a low crime area. Financial institutions already disadvantage those in high-crime areas for the reasons mentioned above and

many more. High-crime areas require money to be spent on aspects of the economy, and this reallocation of resources reduces efficiency. Furthermore, as crime rates increase, income inequality also increases, which leads to more crime (Barua and Mahesh, 2018). Contrastingly, areas with low crime encourage domestic and foreign investment, reducing income inequality, and leading to less crime. Thus, the relationship between crime and the economy can be a spiraling one.

There is also research to suggest that crime rates do not impact the economy. For example, past data suggests that the two do not correlate. Crime rates rose across most metrics from 1955 to 1972, but that was accompanied by a period of economic growth, excluding the early 1960s. (Eli Lehrer, "Crime and Economy: What Connection?", 2000). To further the point, Lehrer also notes that crime rates fell from 1934-1938, but the nation was still struggling from the Great Depression. Other factors that are not economic-based affect crime rates, such as police deployment and management, demographic, and prison reforms. Likewise, factors such as interest rates and tax laws that are not crime-related significantly impact the economy.

Though crime rates and the economy may indeed have an inconsistent and only hypothetical relationship, it is essential to note the real question being tested here: financial development as opposed to the economy. Though the United States may not have any significant correlation between crime rates and the economy, the *development* of countries may be hindered. The United States in the 1900s, as Lehrer referred to, was already a pretty developed economy; therefore, it withstood fluctuations in the economy. This, however, is not true for every country, and some countries that are not as financially stable as the United States may, in fact, experience.

more damaging effects of crime on their economy. One noteworthy example of a country suffering from corruption, fraud, and other crimes is Venezuela. Since the military oversees multiple important things such as food distribution, corruption became widespread as resources do not reach those who need it. Therefore, crime rates likely have a strong impact on the development of countries.

Prior to the analysis done in this paper, I hypothesize that crime rates will have a direct impact on financial development statistics in countries worldwide. I also believe that intentional

homicide will be a much larger indicator of this trend as opposed to fraud and corruption, due to the violence of the crime itself.

### 3. Data

Table 1 provides descriptive summary statistics, including the mean, median, standard deviation, minimum, and maximum values of all variables used in the empirical analysis.

**Table 1. Descriptive Summary Statistics**

	<b>Mean</b>	<b>Median</b>	<b>Std. Dev</b>	<b>Minimum</b>	<b>Maximum</b>
<b>Bank accounts per 1,000 adults</b>	615.464518	483.94	561.356333	1.17	3383.357
<b>credit card ownership (% age 15+)</b>	18.0189501	9.915	20.2141458	0	82.58
<b>Debit card ownership (% age 15+)</b>	38.4824449	29.805	30.646695	0.27	98.81
<b>Financial system deposits to GDP (%)</b>	41.4218638	31.23	42.5839694	0.02	770.26

<b>Private credit by deposit money banks and other financial institutions to GDP (%)</b>	37.7512347	25.52891	41.9853189	0.0103713	986.12
<b>Domestic credit to private sector (% of GDP)</b>	43.8653359	25.9	266.052928	0	15675.28
<b>Stock market capitalization to GDP (%)</b>	60.9847156	36.4	104.083279	0	1768.8
<b>Stock market total value traded to GDP (%)</b>	27.6192757	6.39	62.0295609	0	952.67
<b>Bank lending deposit spread</b>	7.9977192	6.25	7.48907383	0.03	88.49
<b>bank deposits to GDP (%)</b>	41.3199664	31.02	42.7793279	0.010706	770.26
<b>Victims of intentional homicide rate per 100,000</b>	8.31276947	3.21766322	12.69062	0	141.72258

<b>Corruption Rate per 100,000</b>	22.5247156	11.178414	33.3327117	0	230.241858
<b>Fraud Rate per 100,000</b>	234.134008	106.153968	381.553466	0.00893427	3020.66964

The data compiled and analyzed as well as definitions for statistics is stated as the following. As far as crime variables, three separate ones were considered. Intentional Homicide victims (rate per 100,000 individuals): the deliberate and unlawful killing of one person by another; murder. This data is drawn from United Nations Office on Drugs and Crime (unodc.org) and, as the definition claims, measures the rate at which murder occurs on a rate per 100,000 bases in various countries. The data was compiled from 1990-2021 at the max, though less data is available for some countries. The number of observations vary. Secondly, the statistics for fraud (rate per 100,000 individuals) is defined as: wrongful or criminal deception with the intent of financial or personal gain. This data is drawn from the United Nations Office on Drugs and Crime (unodc.org) and measures the rate at which fraud occurs on a rate per 100,000 individual bases. The data was compiled from a various range between 1990-2021. The number of observations vary depending on available statistics. Finally, the last crime variable was corruption (rate per 100,000 individuals), defined as dishonest or fraudulent conduct committed oftentimes by those in power, usually involving bribery. The data is drawn from the United Nations Office on Drugs and crime (unodc.org) and measures the rate at which corruption occurs on a rate per 100,000 individuals' basis. The data was compiled from 1990-2021 and the number of observations varies by country based on available statistics.

The next variables are all statistics with reference to financial development. They are as follows.

Bank accounts per 100,000 adults: The amount of bank accounts owned per individuals who are above the age of 18. Taken from World Bank (worldbank.org). Credit Card ownership (% age 15+): the percent of the population above the age of 15 who own a credit card. Data taken from 1990-2021 from World Bank (worldbank.org). Debit card ownership (% age 15+): the



percent of population above the age of 15 who own a debit card. Taken from World Bank (worldbank.org). Financial system deposits to GDP (%): the ratio of financial deposits, which includes transactions with banks and checking accounts, etc. to GDP, as a percentage. Taken from World Bank (worldbank.org). Private credit by deposit money banks and other financial institutions to GDP (%): The ratio of the private credit to GDP as a percentage. Taken from World Bank (worldbank.org). Domestic Credit to private sector (% of GDP): The total credit given to the private sector as a percentage of GDP. Taken from World Bank (worldbank.org). Stock Market Capitalization to GDP (%): The percentage of a country's GDP that is constituted by the stock market. Taken from World Bank (worldbank.org). Stock Market total value traded to GDP (%): The ratio showing the percentage of a country's GDP that is constituted by the total value traded on the stock market. Taken from World Bank (worldbank.org). Bank lending deposit spread also known as net interest spread, the difference between the interest rates a bank charges a borrower and the interest rate the bank pays a depositor. Taken from World Bank (worldbank.org). Bank deposits to GDP (%): Money placed into a deposit account at a bank to the GDP of a country, given as a percentage. Taken from World Bank (worldbank.org).

#### **4. Empirical Methods**

My empirical analysis will rest upon two dimensions. In one, I will calculate and report the correlations of each relevant financial development variable with the crime measure, and in the second, I will visualize those correlations through scatter plots.

As well known, a correlation coefficient is always between -1 and 1. A negative correlation between two variables indicates that the two variables generally move in opposite directions and a positive correlation suggests that they do generally move in the same direction. However, a correlation coefficient that is very close to 0, even though it can be negative or positive, may not be significant. The rule of thumb here is that a positive correlation should be above 0.1 and a negative one should be below -0.1 to be statistically significant. In my case, to increase the level of significance, I will only focus on correlation where the absolute value is above 0.20. By

increasing the level of significance, I am lessening the likelihood the correlation is caused by random chance.

## 5. Results

**Table 2. Correlations between Crime and Financial Development Variables**

<b>Variables</b>	<b>Victims of intentional homicide rate per 100,000</b>	<b>Corruption Rate per 100,000</b>	<b>Fraud Rate per 100,000</b>
<b>Bank accounts per 1,000 adults</b>	-0.0134939	0.17059447	0.060108584
<b>Credit card ownership (% age 15+)</b>	<b>-0.2631772</b>	<b>0.20334349</b>	<b>0.32367863</b>
<b>Debit card ownership (% age 15+)</b>	<b>-0.2631812</b>	<b>0.28812819</b>	<b>0.408814609</b>
<b>Financial system deposits to GDP (%)</b>	-0.1672474	-0.0525223	0.057013221
<b>Private credit by deposit money banks and other financial institutions to GDP (%)</b>	<b>-0.2119795</b>	<b>0.245998</b>	<b>0.386406198</b>
<b>Domestic credit to private sector (% of GDP)</b>	<b>-0.2067225</b>	0.16002356	<b>0.267645297</b>
<b>Stock market capitalization to GDP (%)</b>	-0.0280182	0.08584058	0.017758097

<b>Stock market total value traded to GDP (%)</b>	-0.1207842	0.14818517	0.002848223
<b>Bank lending deposit spread</b>	0.17801597	-0.1716593	-0.137359689
<b>Bank deposits to GDP (%)</b>	-0.1691725	-0.0511576	0.056699303

It is important to note that Correlation does not imply causality, though it shows there may be some relation between the two variables. As shown in the Table 2 above, a few variables have a significant correlation; that is, as explained above, a correlation with the absolute value greater than 0.20.

Table 2. reveals the following about significant variables:

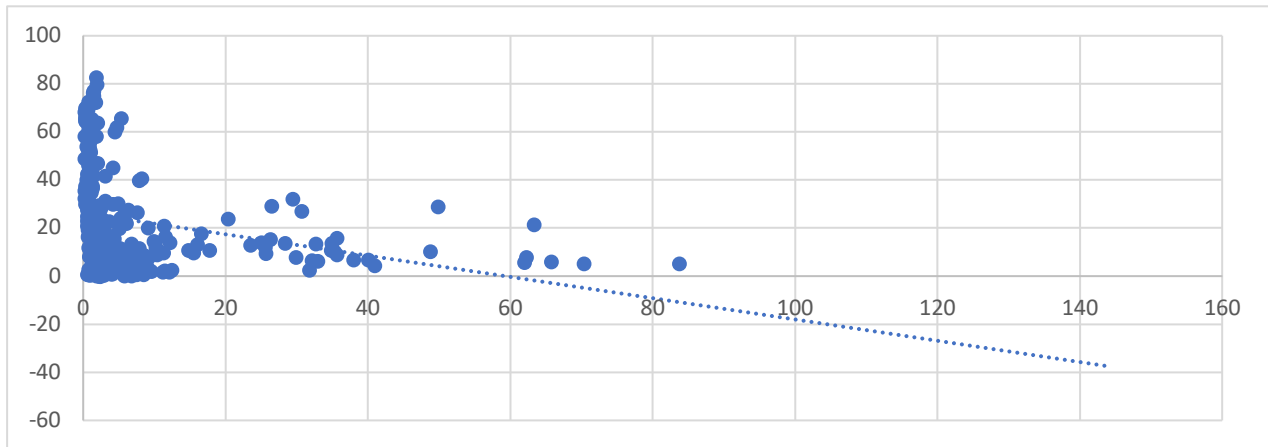
The ratio between credit card ownership and victims of intentional homicide has a negative correlation of -0.26318. This shows that as victims of intentional homicide increase on a rate per 100,000 individuals' basis, the percentage of people age 15+ who own a credit card decreases. The ratio between credit card ownership to corruption and fraud is 0.2033 and 0.3237, respectively. Interestingly, this demonstrates that as corruption and fraud increase, credit card owners that are 15+ years old also increase.

Like credit card ownership, the ratio between debit card ownership and victims of intentional homicide has a negative correlation of -0.2631812. As victims of intentional homicide increase on a rate per 100,000 individual basis, debit card ownership decreases. Additionally, the ratio of debit card ownership to fraud and corruption is 0.28812819 and 0.408814609, respectively. Thus, an increase in fraud and corruption increases individuals who own a debit card age 15+.

The ratio of private credit by deposit money banks to GDP follows the trend thus far; the ratio of this variable to victims of intentional homicide is -0.2119795, demonstrating a significant decrease in the ratio of Private credit by deposit money banks and other financial institutions to GDP as homicide increases. This, however, is the opposite with fraud and corruption, as the ratios are 0.245998 and 0.386406198, respectively.

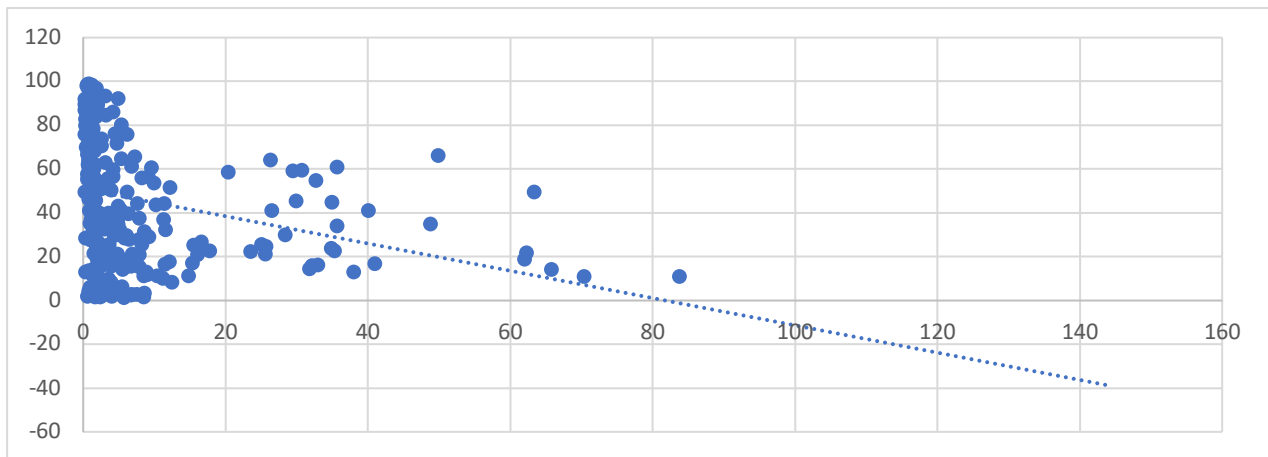
The ratio of domestic credit to private sector, % of GDP to victims of intentional homicide is

-0.2067225, which is, once again, a significant negative correlation. The ratio of domestic credit to private sector % of GDP to corruption is insignificant, and the ratio to fraud is 0.267645297, showing that there is an increase in fraud, the domestic credit to private sector % of GDP increases.



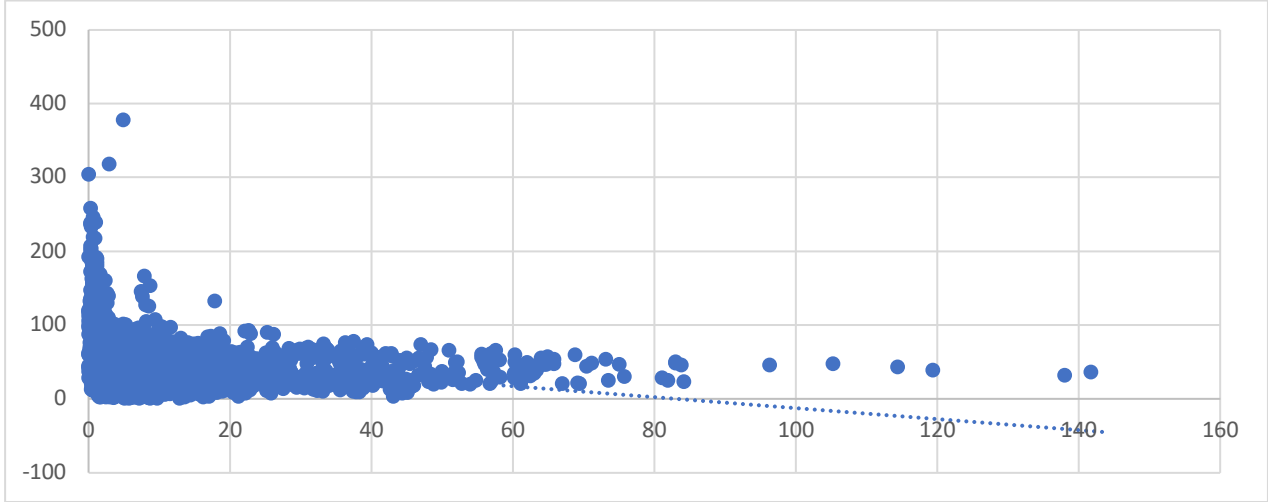
**Figure 1. Intentional homicide and credit card ownership (% age 15+)**

Figure 1 illustrates the correlation between the intentional homicide rate and credit card ownership. In line with what we observe in Table 2, where the reported correlation coefficient of -0.26 is significantly negative, we observe a negatively sloped trend line in Figure 1.



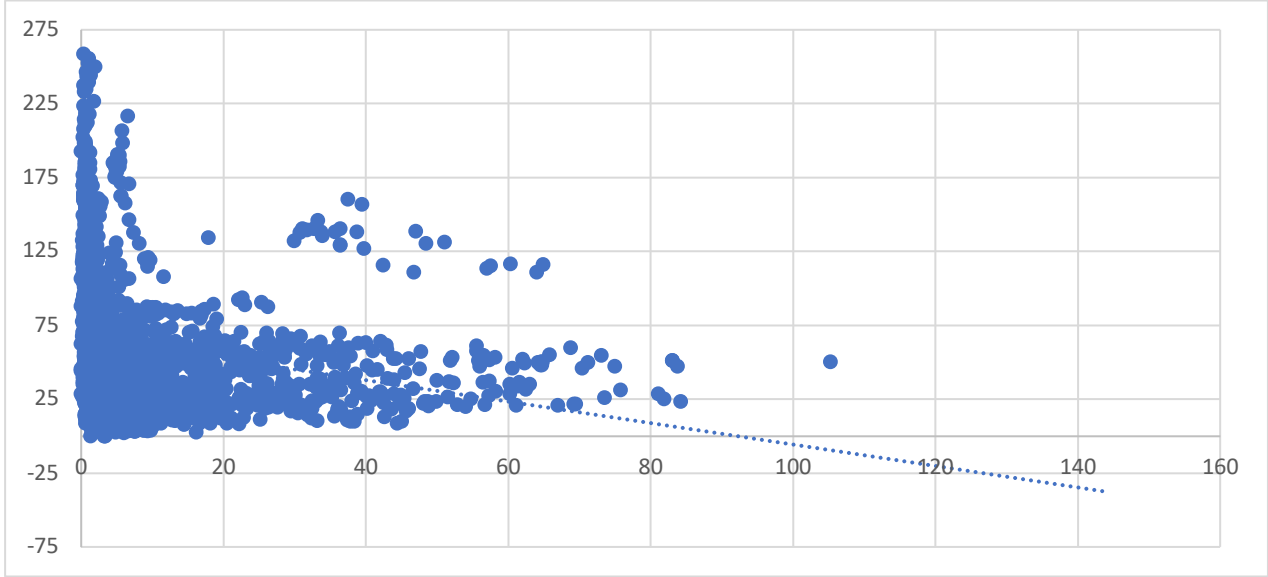
**Figure 2. Intentional homicide and Debit card ownership (% age 15+)**

Figure 2 highlights the relationship between Intentional homicide and Debit card ownership. Similar to the data in Table 2, we see a negative trend line with a slope of -0.26.



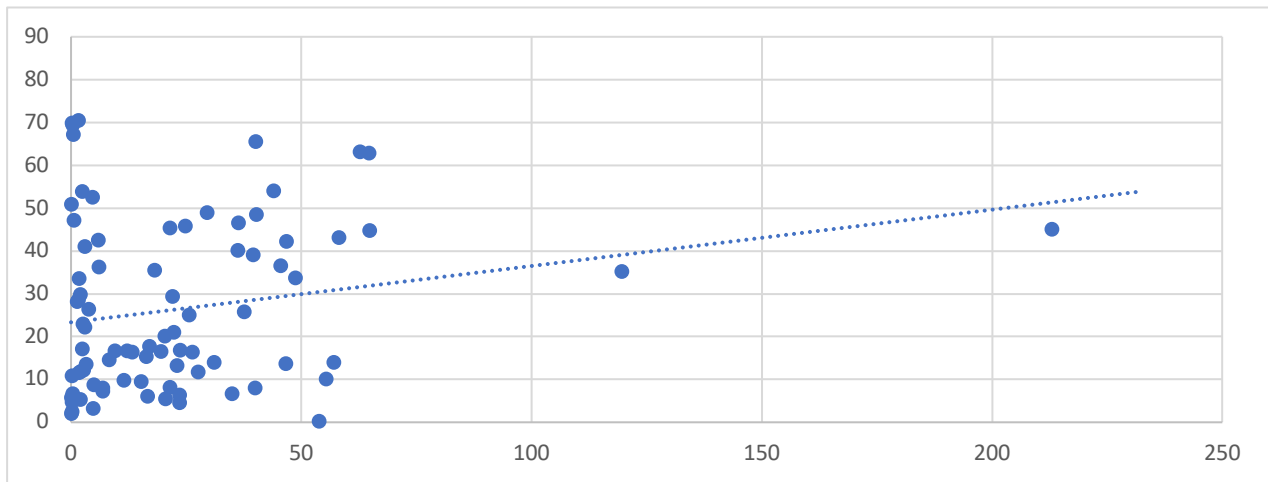
**Figure 3. Intentional homicide and Private credit by deposit money banks and other financial institutions to GDP (%)**

Figure 3 presents the relationship between intentional homicide and private credit by deposit money banks and other financial institutions to GDP (%). In line with the trends presented in Table 2, we can see a negative trend line with a slope of -0.2119795



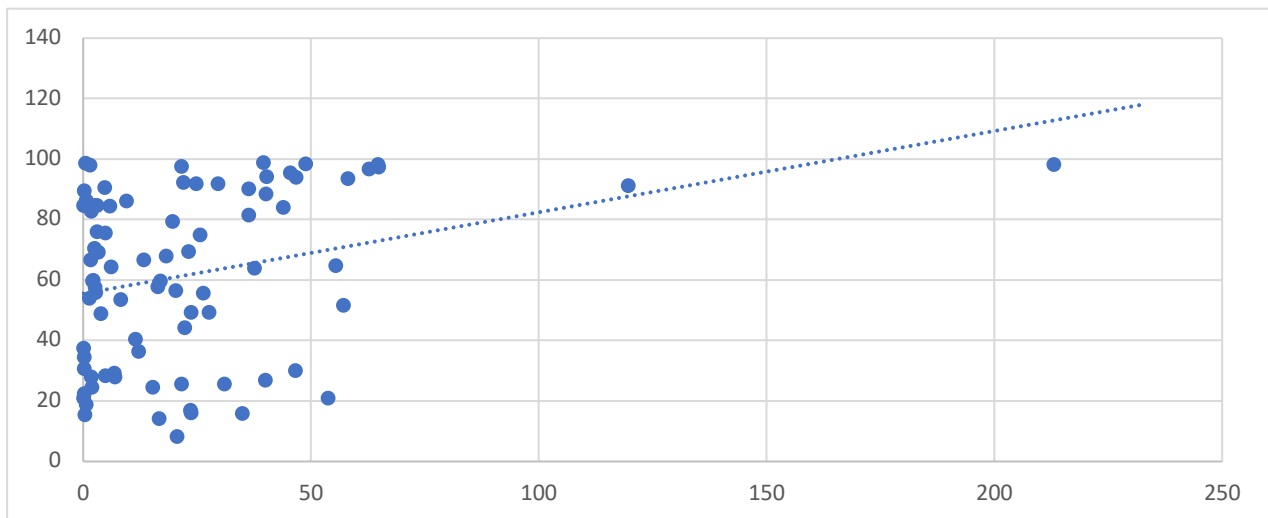
**Figure 4. Intentional homicide and domestic credit to private sector (% of GDP)**

Figure 4 shows the relationship between intentional homicide and domestic credit to private sector. As depicted in Table 2, the trend line shows a negative correlation, with a slope of -0.2067225



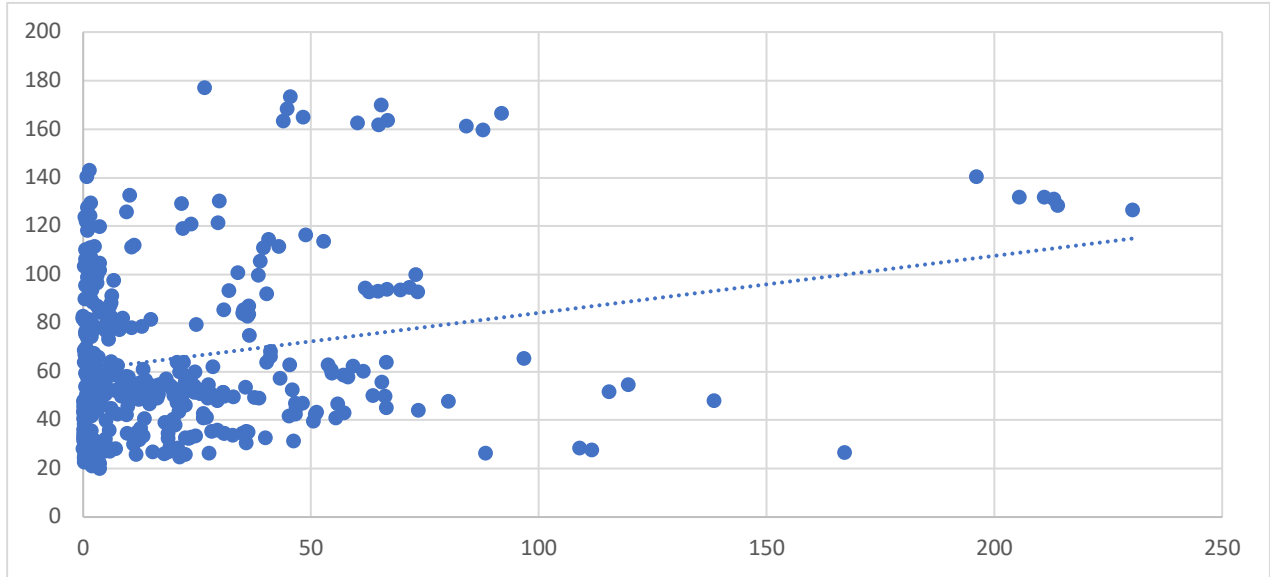
**Figure 5. Corruption rate and credit card ownership (% age 15+)**

Figure 5 illustrates the relationship between corruption and credit card ownership. The chart shows the trendline stated in Figure 2, with a positive correlation and a slope of 0.20334349.



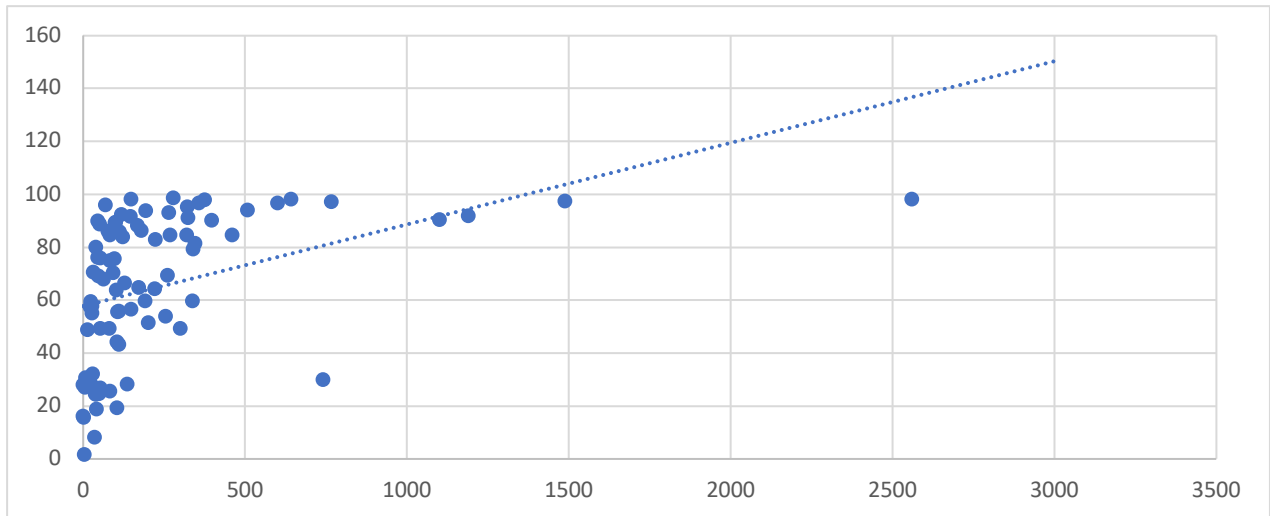
**Figure 6. Corruption and Debit card ownership (% age 15+)**

Figure 6 shows the correlation between Corruption and Debit card ownership and portrays the correlation described in Figure 2 of a slope of 0.28812819



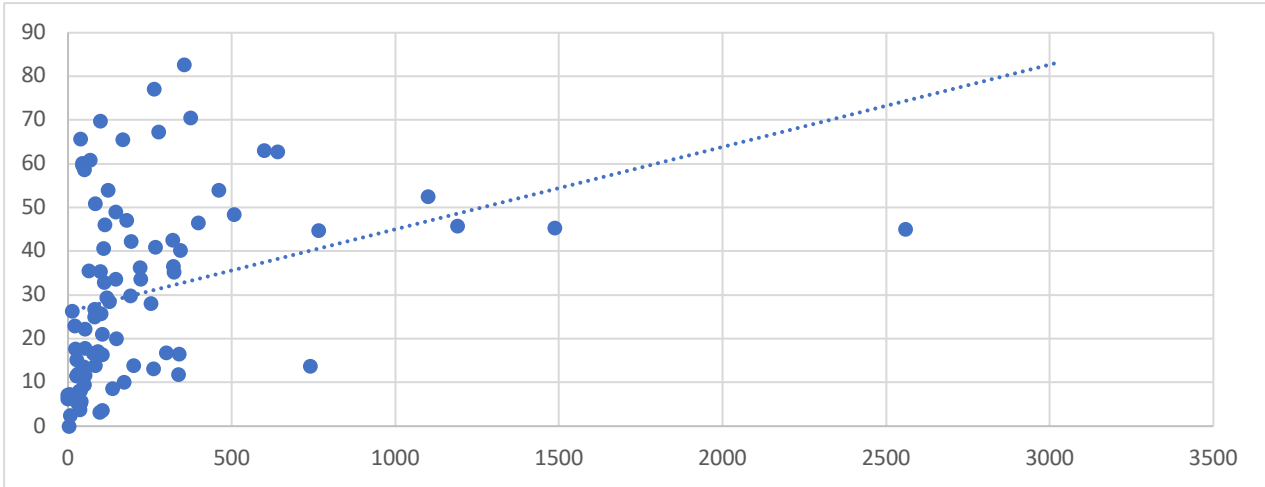
**Figure 7. Corruption and Private credit by deposit money banks and other financial institutions to GDP (%)**

Figure 7 highlights the correlation between Corruption and Private Credit by deposit banks and financial institutions to GDP, and shows a positive correlation in line with Table 2 of 0.245998



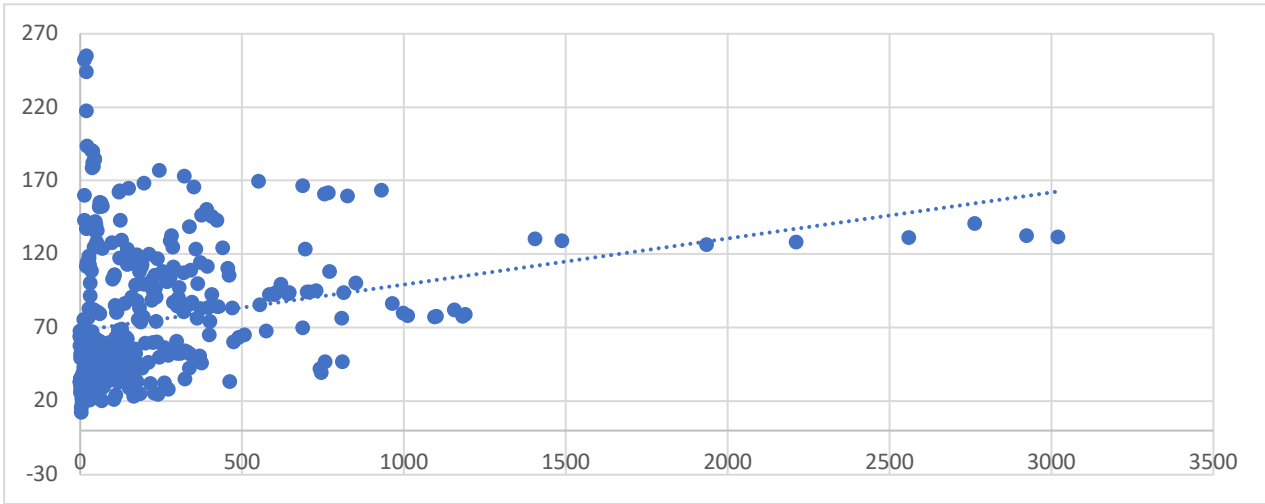
**Figure 8. Fraud and Credit card ownership (% age 15+)**

Figure 8 depicts the relationship between Fraud and Credit card ownership. The graph shows the same positive trend line slope as stated in Figure 2: 0.32367863



**Figure 9. Fraud and Debit card ownership (% age 15+)**

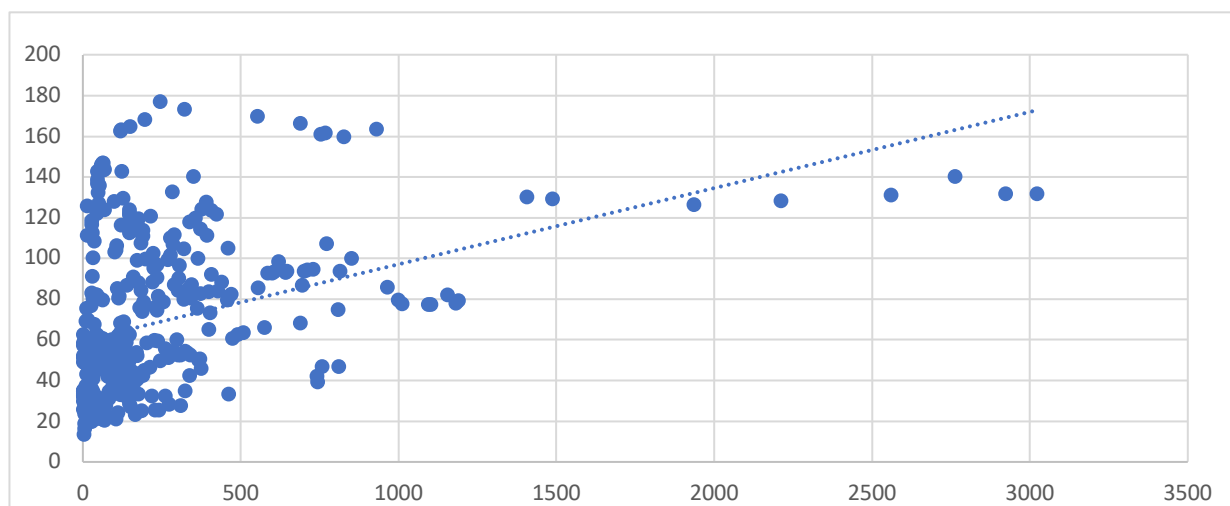
Figure 9 demonstrates the relationship between Fraud and Debit Card ownership, with a positively correlated trendline with a slope of 0.408814609, in line with Table 2.



**Figure 10. Fraud rate and Domestic Credit to private sector (% of GDP)**

Figure 10 illustrates the positive trendline with slope 0.267645297, as also given in Table 2, between Fraud rate and Domestic credit to private sector.





**Figure 11. Fraud and Private credit by deposit money banks and other financial institutions to GDP (%)**

Figure 11 shows the relationship between Fraud rate and Private Credit by deposit money banks and other institutions to GDP and depicts the positive trend line with a slope of 0.386406198.

## 6. Conclusion

In concluding the paper, several takeaways come to the forefront. First, it is essential to note that according to the results in Table 2 and the following charts with plotted correlations, it appears that Fraud and Corruption increase the statistics regarding financial development. This is counterintuitive, as though it may seem that any crime would negatively impact financial variables, it is shown that crimes such as fraud and corruption do not have that effect. Secondly, as expected, a violent crime such as Intentional Homicide has clear negative impacts on financial variables, as shown in Table 2 and Figures 1-4. Thus, according to the research I conducted, though Fraud and Corruption have little to no negative impact on financial development, intentional homicide certainly does.

As touched on throughout, the study's results must consider the limitations of the variables taken into account. It would be ignorant to take results at its heart and directly conclude based on the data. The paper does not entirely isolate variables, as numerous other factors

could affect financial development variables, such as demographic, GDP, political situations, etc. The research could be extended by focusing on a single country and taking more financial and crime variables to further the exactness of the data in depicting actual trends. Furthermore, the research could dive deeper into specific crimes and their effects on small-scale economies, such as local communities.

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