Income equality and crime rates in New York State: a county-level empirical analysis

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Abstract. This study examines and evaluates the connection between crime rates in 14 New York State counties and income inequality, which is measured in this study using the GINI coefficient. Using county-level crime statistics (data.census.com) and data from the American Community Survey, this study uses regression modeling and scatterplots to investigate relationships between various forms of crime and wealth disparity. This covers crimes involving firearms, violent criminality, and property crime. The results indicate that rising violent crime rates are strongly positively correlated with larger GINI coefficients (R-squared = 0.394), whilst property crime rates are less strongly correlated (R-squared = 0.225). These results agree with the existing works, which also prove the link between inequality and crime across diverse socio-economic contexts. The paper argues that higher income inequality strengthens social tension, resulting in higher level of violent crime like the Bronx County. The findings suggest that policymakers should consider income inequality through targeted social interventions and economic reforms to reduce crime rates. Future research may focus on longitudinal studies to assess how shifts in income inequality over time influence crime dynamics.

Keywords: Income equality, crime rates, county-level crime statistics, American Community Survey, egression modeling, scatterplots.

1. Introduction

One characteristic of contemporary economic systems is income disparity, which is frequently linked to a number of unfavorable societal consequences. Inequalities in economic distribution have been connected to an increase in crime as the wealth gap widens. Numerous studies indicate a close connection between social unrest and inequality (Machin & Meghir, 2004). High levels of income disparity have been linked to social tensions and circumstances where crime is more common among those who lack access to economic possibilities, according to studies.

In US, income inequality varies significantly across regions and urban areas, with some states displaying a clearer disparity than others. New York States, with its blend of affluent and economically struggling counties, provides a valuable context for examining how income inequality correlates with crime. Counties like the Bronx suffer extreme income inequality and high crime rates. Meanwhile, others such as the Nassau County has lower inequality and crime. This variation presents a unique opportunity to look into to what extent the income inequality contributes to crime at the county level.

Fewer studies have examined smaller, more localized locations, despite the fact that the link between inequality and crime has been extensively established on a national and worldwide scale. This study aims to close that gap by examining the relationship between crime rates in 14 New York State counties and economic inequality, specifically as determined by the GINI coefficient. This study intends to determine whether wealth disparity is a significant predictor of crime in many categories, such as violent crimes, property crimes, and crimes involving firearms, by concentrating on localized data.

Drawing on economic theories such as Becker's rational choice theory, this study shows that higher income inequality increases the likelihood of criminal activities by accelerating social frustration and reducing the benefits of legitimate employment opportunities. Using data from the Census website and crime statistics for each county, regression analysis and scatterplot visualizations will be used to show the strength of the link between the GINI coefficient and crime rates.

This study not only contributes to the academic purpose on the economic and social impacts of

income inequality but also provides practical insights for policymakers. By understanding how income inequality influences crime in specific counties, targeted intervention such as education or job creation could help to lower crime in high-risk areas like the Bronx.

2. Literature Review

Numerous studies have been conducted in various contexts and geographical areas to examine the connection between crime and income disparity. Higher levels of inequality are frequently linked to higher rates of crime, according to their frequently consistent findings. This behavior may be explained by economic and social theories, such as Becker's (1968) rational choice theory and Merton's (1949) strain theory. According to these views, social tensions and personal incentives to commit crimes increase along with financial inequality. With an emphasis on violent and property crime, this review of the literature will look at current research conducted in the last ten years to investigate the relationship between economic disparity and crime. since the context of New York State counties is best served by these categories.

The impact of both local and wider economic inequality is examined in Dahlberg and Gustavsson's (2015) seminal work, Income Inequality and Crime in Local Contexts. The authors discover a strong correlation between increased rates of violent crime and local wealth inequality. Violent crime rates rise by 8.7% for every standard deviation increase in the GINI coefficient. This result is especially pertinent to the current study, which looks at data at the county level in New York State. Similar to Swedish municipalities, New York counties exhibit a wide range of local income disparity, raising the possibility that these differences could be a major contributing factor to the observed rise in crime.

Kivilahti and Aaltonen (2020) conducted a meta-analysis synthesizing findings from multiple studies across neuropathic to assess the strength of the association between income inequality and crime. This analysis shows a clear positive correlation between income inequality and violent crime. Meanwhile, the link between income inequality and property crime was less obvious (Choe, 2008). The study highlights the importance of socio-economic factors such as social cohesion and public spending in mitigating crime. It suggests that inequality maybe a stronger predictor of violent crimes. Their conclusion aligns with the present analysis of New York State, where violent crime appears more strongly correlated with higher GINI coefficients compared to property crime.

In a more global context, Sugiharti et al. (2023) explored the relationship between income inequality and crime in Indonesia. By using panel data from 34 provinces over nine years, their study found that higher income inequality and poverty levels were both significantly associated with increased crime rates. They used the “Generalized Method of Moments” to approach the result. It allowed the authors to control for various factors, confirming that income inequality is a robust predictor of crime. This finding again shows the relevance of income inequality-crime nexus and supports the hypothesis that reducing inequality could lead to reductions in crime.

Kim (2021)’s study does not focused on crimes directly. It examines the impact of income inequality on health outcomes during the COVID-19 pandemic across US counties. They found that counties with higher GINI coefficients experienced higher COVID-19 cases and deaths. It suggests that income inequality also causes social vulnerabilities. While their focus is on health, the broader implication of their findings is that income inequality may increase the susceptibility of regions to many social disarrays (Whitworth, 2011). Crime could be one of them. This supports the argument that relationship between income inequality and negative social outcomes.

Finally, Jawadi et al. (2022) provided further empirical support for the link between income inequality and crime in their panel study across multiple countries. The authors found that both unemployment and income inequality contribute to higher crime rates. Their findings emphasize that while income inequality alone is a strong predictor of crime, other socioeconomic factors such as employment opportunities should also be considered. It shows the importance of policy interventions.

Collectively, these studies provide strong empirical evidence that income inequality is a key determinant of crime, especially violent crime. Dahlberg and Gustavsson’s (2015) focus on local

contexts which are parable to the county-level analysis of New York State in this paper. Meanwhile, Kivilahti and Aaltonen's (2020) meta-analysis supports the argument that violent crimes are strongly correlated with inequality. This paper also observed the preliminary data for New York counties such as the Bronx where high inequality and high violent crime rates appear. The global perspective provided by Sugiharti (2023) and national perspective by Kim (2021) further prove the argument that income inequality causes various social instabilities including crime.

In order to investigate the connection between economic disparity and crime at a more localized level, this paper will build on previous studies. It focuses on New York State's distinct socioeconomic environment. By doing this, this research aims to add to the current scholarly debate about how income disparity affects crime and what policies may be used to address this impact.

3. Methodology

3.1. Data collection

The data for this study was sourced from the United States Census Bureau website, specifically from the 2021 American community Survey. The ACS provides comprehensive, county-level data on household incomes across United States, making it an ideal and reliable source for analyzing income inequality in New York counties. The ACS data was accessed through the publicly available Table S1901, which includes detailed information on household income distribution for each county. The crime data was obtained from the "New York State Division of Criminal Justice Services", which offers county-specific crime statistics for the same year, broken down into categories such as violent crimes, property crimes, and firearm-related crimes.

To extract the data, the ACS online platform provides step-by-step guidance. It allows users to select the relevant countries and download household income data in a structured format. For this study, income data for 14 counties in New York State was retrieved. It represents a diverse range of urban, suburban, and rural areas of New York. The income data was essential for the calculations of GINI coefficient which is a key measure of income inequality. Meanwhile, the crime data was used to analyze the relationship between inequality and crime rates.

3.2. Understanding the GINI coefficient

In urban economics, the GINI coefficient is a crucial metric for evaluating how income is distributed among a community. A more equal income distribution, where wealth is dispersed equitably among families, is indicated by a GINI coefficient that is closer to 0. On the other hand, a GINI value nearer 1 indicates a highly unequal distribution in which a tiny percentage of the population controls a significant chunk of the total income.

In this study, the GINI coefficient serves as the primary metric for quantifying income inequality across the 14 counties in New York State. This measure allowed for a direct comparison of inequality levels between counties, such as the Bronx (which exhibits a very high inequality) and Nassau County (which has a much lower inequality). By using the GINI coefficient, this study was able to correlate income inequality with crime rates, providing insights into how disparities in income distribution may contribute to higher crime rates in certain counties.

3.3. Calculation of the GINI coefficient and step-by-step data processing

After extracting the raw income data, the next step is to process this data into a form suitable for calculating the GINI coefficient.

As provided by the ACS dataset, income data was divided into predetermined income brackets in order to compute the GINI coefficient. The income distribution was then examined by grouping households into these brackets and computing the cumulative share of income and population for each bracket. A Lorenz curve, which depicts the distribution of income among the population, was plotted using these values.

By computing the area between the Lorenz curve and the line of perfect equality, which is a 45-

degree line, the GINI coefficient is obtained from the Lorenz curve. The following is an expression for the GINI coefficient formula:

$$GINI = 1 - 2 \times Area\ under\ the\ Lorenz\ Curve \quad (1)$$

Using Microsoft Excel, the GINI coefficient for each county was calculated.

3.4. Statistical methods

To examine the relationship between crime rates and wealth disparity, scatterplots were created. The GINI coefficient was represented on the X-axis of each scatterplot, while the Y-axis displayed other crime rates, such as violent crime, property crime, and crime involving firearms. The strength of these associations was evaluated using linear regression analysis, with the R2 value indicating the proportion of crime rate variance that could be attributed to economic disparity. Regression analysis followed the equation:

$$y = \beta_0 + \beta_1 x + \epsilon_y \quad (2)$$

Where:

- y represents the crime rate,
- x is the GINI coefficient (independent variable),
- β_0 is the intercept, and
- β_1 is the coefficient of GINI's effect on crime.
- The R^2 value from the regression analysis provided insights into the robustness and strength of the results

4. Result

4.1. GINI coefficient across counties

The GINI coefficients calculated for the 14 New York State counties reveal varying degrees of income inequality, as shown in Table 1. Urban counties such as the Bronx and New York County exhibit the highest GINI coefficients, indicating significant income disparity, while suburban counties like Nassau and Suffolk show lower levels of inequality. Above is a summary of the GINI coefficients for the counties.

Table 1. GINI coefficient across counties.

County	2022 GINI
1. Suffolk	0.3602
2. Nassau	0.3259
3. Queens	0.4305
4. Kings	0.4305
5. Richmond	0.4106
6. New York	0.4471
7. Bronx	0.5217
8. Westchester	0.4109
9. Rockland	0.3915
10. Putnam	0.3659
11. Orange	0.4169
12. Ulster	0.4565
13. Sullivan	0.4985
14. Dutchess	0.4212

4.2. Crime rates across counties

Crime rates also vary significantly between counties. Urban counties, particularly those with higher GINI coefficients, tend to have higher crime rates, especially in violent crime categories. Table 2 below is an example table summarizing crime rates for two categories.

Table 2. Two categories of crime rates.

Crime Index Rate	Violent Crime Rate	Property Crime Rate	Crime Rate w/Firearm
1,132.5	96.3	1,036.2	21.7
903.4	138.2	765.2	18.8
1,685.6	439.8	1,245.8	60.5
1,909.4	576.8	1,332.6	89.5
980.9	265.8	715.0	34.8
3,392.4	742.6	2,649.7	85.9
2,686.1	1,039.0	1,647.1	179.8
928.5	151.5	777.0	22.0
681.8	97.9	583.9	10.7
461.4	48.5	412.9	4.0
1,229.7	192.4	1,037.3	35.8
934.7	130.9	803.8	19.8
1,181.5	168.8	1,012.7	15.5
1,098.8	180.7	918.1	29.3

4.3. Correlation between GINI coefficient and crime rates

Income disparity and crime rates, especially violent crime, are clearly positively correlated, according to the scatterplots produced for each crime category (see Figure 1 and Figure 2).

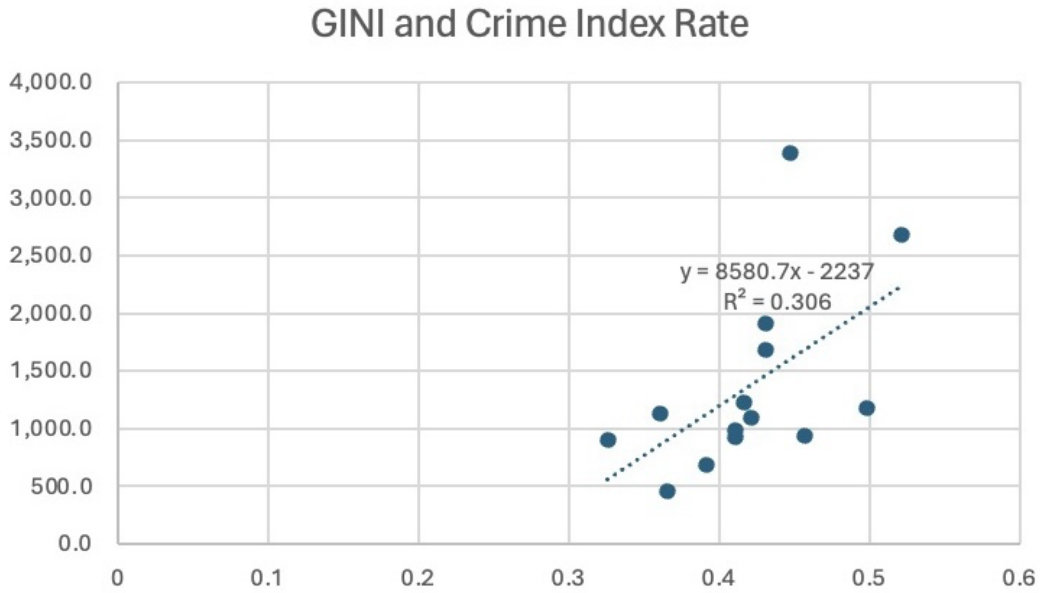

Figure 1. GINI and Crime index rate. Each point in the scatterplot represents a data pair of GINI index and Crime Index rate for a specific region or time period. The distribution and pattern of the points indicate the nature of the relationship between income inequality and crime.

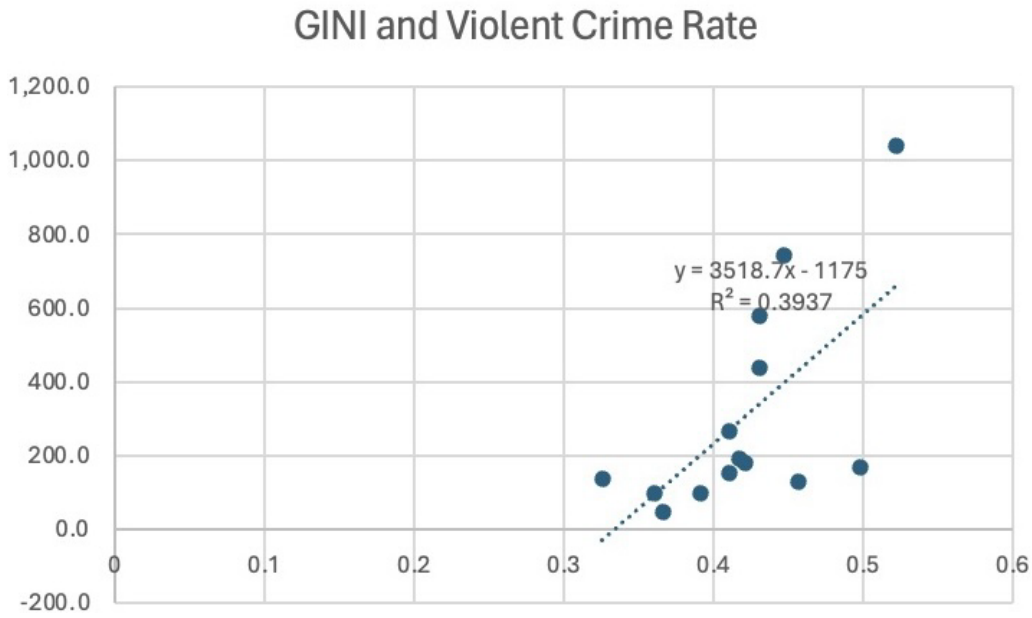

Figure 2. GINI and Violent Crime rate. Each point in the scatterplot corresponds to a specific observation, with the GINI index and Violent Crime rate values for a given region or time period. The distribution of points illustrates any potential correlation, pattern, or clustering between income inequality and violent crime.

The regression analysis's R2 value for violent crime was 0.394, indicating that variations in income inequality account for around 39% of the variation in violent crime rates among these counties. This suggests that there is a direct link between increased rates of violent crime and significant wealth inequality.

These findings support the notion that violent crime has the strongest correlation with wealth disparity, as evidenced by the category's highest R2 value. Although income disparity affects property crime rates, other factors might also be important, as indicated by the comparatively smaller link with property crime (R2 = 0.225).

The idea that counties with greater wealth inequality typically have higher rates of crime, especially violent crime, is highly supported by the visualizations and regression results. Although economic disparity is a major predictor of violent crime, its effect on property crime is less clear, as seen by the scatterplots and R2 values. The regression line and the degree of association between GINI and crime rates are displayed in the trendline figure below.

The regression analysis's findings unequivocally show that economic disparity and crime are positively correlated, especially when it comes to violent crime categories. A significant amount of the variation in violent crime rates may be explained by the GINI coefficient, a measure of economic inequality, supporting the notion that income inequality is a major contributor to social instability.

5. Discussion

The purpose of this study is to investigate the connection between crime rates in 14 New York State counties and economic inequality as measured by the GINI coefficient. It demonstrates that violent crime and income inequality are strongly positively correlated. These results are consistent with previous research indicating that social tensions are caused by income differences.

There are policy ramifications due to the robust correlation between violent crime and income disparity in New York State counties. Reducing violent crime may be accomplished by addressing the underlying reasons of income inequality. To lessen inequality and the detrimental effects that go along with it, policymakers should think about using a multipronged approach that combines targeted social interventions with economic reforms.

Economic reforms improve the wage distribution, increasing access to quality education and expanding employment in disadvantaged areas. It could mitigate the socio-economic drivers of crime. Moreover, urban planning and community development that focus on reduce social fragmentation may also enhance social cohesion and therefore reduce crime.

It should be mentioned that the study has several shortcomings even if it provides useful information regarding the relationship between crime and income inequality. Cross-sectional data, which only documents crime rates and wealth disparities at a specific point in time, is used in this study. This makes it more challenging to prove causation or monitor how shifts in inequality over time may affect crime trends. A longitudinal study could offer a more comprehensive understanding of how shifts in economic disparity impact crime dynamics over time.

6. Conclusion

This study examines the relationship between economic inequality as measured by the GINI coefficient and crime rates in 14 counties in New York State. The results show a significant positive correlation between income inequality and violent crime. greater GINI coefficients are always associated with greater rates of violent crime. The weaker correlation between income inequality and property crime suggests that it is more important in violent crime categories.

The results are consistent with previous studies on the link between crime and wealth disparity. They back up notions like relative deprivation and the strain hypothesis, which contend that people may turn to criminal activity as a result of perceived social isolation and economic frustration. Conflicts brought on by a lack of good economic possibilities could result in increased incidences.

From a policy perspective, these results indicate the need for targeted government interventions which reduce income inequality. Policymakers should consider providing more funding on quality education and more employment opportunities. Such efforts could play an essential role in mitigating violent crime, particularly in urban areas where income disparity is most visible.

This study does have some drawbacks, though. It disregards other factors like unemployment, migration, and education because it is a cross-sectional analysis. These relationships should be investigated in future research. A more thorough and nuanced understanding of the intricate processes at work may also be possible by including a wider range of factors.

In summary, this study highlights the essential impact that wealth inequality plays in the rate of violent crime and offers valuable insights into the socioeconomic factors that influence crime in New York State counties. Policymakers can significantly lower crime and promote more just, stable societies by tackling the economic inequalities that fuel social discontent. Policymakers can significantly lower crime and promote more just, stable societies by tackling the economic inequalities that fuel social discontent.

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