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Econometrics
12/13/2024

Introduction:

Income Inequality as Determinant of Crime Rate

By the 1960s and 1970s the United States were marked by significant social and economic upheaval. During this period, crime rates, particularly violent crimes, rose sharply across urban centers, including cities like New York. Various factors ranging from economic inequality and political instability, showed the decline of manufacturing jobs that contributed to this trend. This section explores how income inequality during the 1960s and 1970s directly influenced crime rates and shaped the socioeconomic conditions that persist today. New York City is a unique urban area comprising five boroughs: Bronx, Brooklyn, Manhattan, Queens, and Staten Island. This city, with a population of approximately 8 million, faces two critical issues. This research examines the relationship between crime rates and income inequality, measured through Gini coefficients, across the five boroughs. To test the hypothesis that boroughs with higher crime rates exhibit lower income inequality, we then analyze NYPD arrest and shooting data, crime distribution, and income inequality. This evaluates whether income inequality inversely correlates with crime.

As we measure income inequality across the boroughs of New York City the use of statistical tools and visualizations developed in R programming will enhance the research that there is an increase in income inequality and it has a big robust effect of increasing crime rates.To conduct the analysis, datasets were imported into the R environment. The required libraries, ggplot2, dplyr, and ineq were loaded to perform data manipulation, visualization, and inequality metrics. The NYPD Arrest Data (2024), NYPD Shooting Incident Data (2024), and

ACS 2021 demographic data were the primary sources. The code ensured borough names were standardized using toupper to merge datasets seamlessly. With these tools in place, the study delved into analyzing crime across the boroughs while juxtaposing graphs and tables to measure wealth disparity.

New York metropolis is frequently referred to as the cultural and economic center of the United States. While the skyline of Manhattan represents wealth and opportunity, boroughs like Brooklyn and the Bronx have long been plagued by crime and poverty. Income disparity, a socioeconomic state that has long influenced the city's crime rates and social scene, is a major element contributing to these differences. The Census Bureau highlights that Manhattan's Gini coefficient, exceeding 0.5, signifies significant income inequality. Many residents struggle with limited resources and opportunities due to wealth concentration among a small elite. In contrast, boroughs like Brooklyn and the Bronx experience high crime rates, with violent offenses like homicide, robbery, and assault prevalent, perpetuating instability and poverty cycles.

There is a direct correlation between economic disparity and criminal conduct, according to criminology theory. People may turn to crime if they are unable to accomplish socially acceptable aims through legal means, according to Robert Merton's strain theory. The high-poverty areas of New York City exhibit this trend, where cycles of despair and criminality are fueled by a lack of work and educational possibilities. For instance, violent and property crimes are common in the South Bronx, which has traditionally been one of the poorest areas in the city. These trends demonstrate the frequent role that inequality and financial strain play as triggers for criminal activity. The data analysis provides more evidence for this connection. According to studies, crime rates are typically higher in neighborhoods with wider wealth gaps. In places like Manhattan's Upper East Side, which borders East Harlem, where extreme wealth

and poverty coexist, social tensions and feelings of exclusion frequently worsen. Increased rates of theft, vandalism, and interpersonal violence may result from these tensions. Furthermore, studies indicate that boroughs with higher Gini coefficients typically have higher reported crime rates, especially for violent crimes. These patterns show that economic disparity is a major contributing factor to urban crime patterns rather than just a background circumstance.

Since the 1990s, New York City has made progress in lowering general crime rates in spite of these obstacles. Violent and property crime have significantly decreased as a result of policies like community policing and public safety measures. But the problem of income disparity still exists. Reducing inequities and promoting long-term safety require programs that address poverty, enhance education, and expand work possibilities. Initiatives like job training programs and the construction of affordable housing, for instance, have demonstrated potential in lowering economic stress in communities that are already at risk.

	BORO	gini_index
1	BRONX	0.52
2	BROOKLYN	0.50
3	MANHATTAN	0.53
4	QUEENS	0.48
5	STATEN ISLAND	0.45

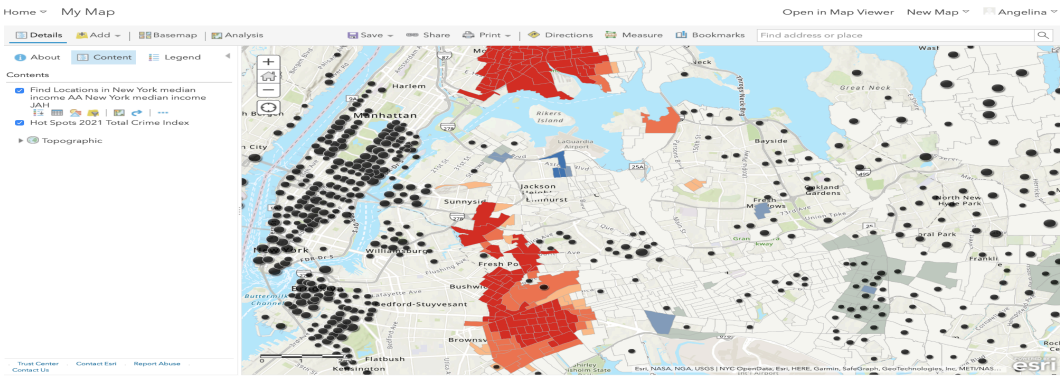
	ARREST_BORO	total_crimes	BORO
1	B	43899	B
2	K	53994	K
3	M	46235	M
4	Q	42978	Q
5	S	8341	S

Literature Review:

As mentioned, New York City experiences crimes on a daily basis, but how can we see it graphically? The article "Correlation of Income and Crime Rates in NYC" by Angelina Morano

offers a thorough analysis of the complex connection between crime and economic inequality in New York City. The study illustrates how economic disparities fuel societal issues by mapping regions with high crime rates and income distribution using data visualization techniques. The report highlights the ongoing relationship between low-income neighborhoods and greater crime rates, even as it highlights recent drops in overall index crime. In order to create safer, more equal communities, it is imperative that income discrepancies be addressed, as this analysis emphasizes. Morano states “The expected household income in the New York City area is $70,663 for the years 2017–2021. It is well known that crime is high in this neighborhood.” However, there has been a recent decline in this crime rate. The study found that "overall index crime compared to February 2022 declined by 5.6% (8,785 v. 9,304) driving a 0.4% (18,909 v. 18,976) reduction in overall index crime year-to-date compared to 2022." The fact that 17% of people in the New York City area live in poverty is another intriguing statistic. When compared to other regions of the US, this is a comparatively high percentage.

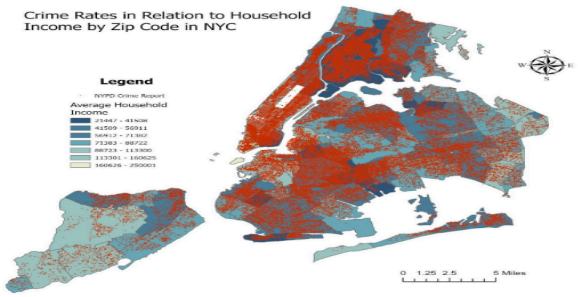
Figure 1:



Morano's research came directly from the Census Bureau and the NYPD government data. The median household income (black dots) and the hot and cool locations for crime rates in the New York City region are displayed. This map discovered that crime rates were greater in places with lower household incomes. The spatial distribution of crime rates across different

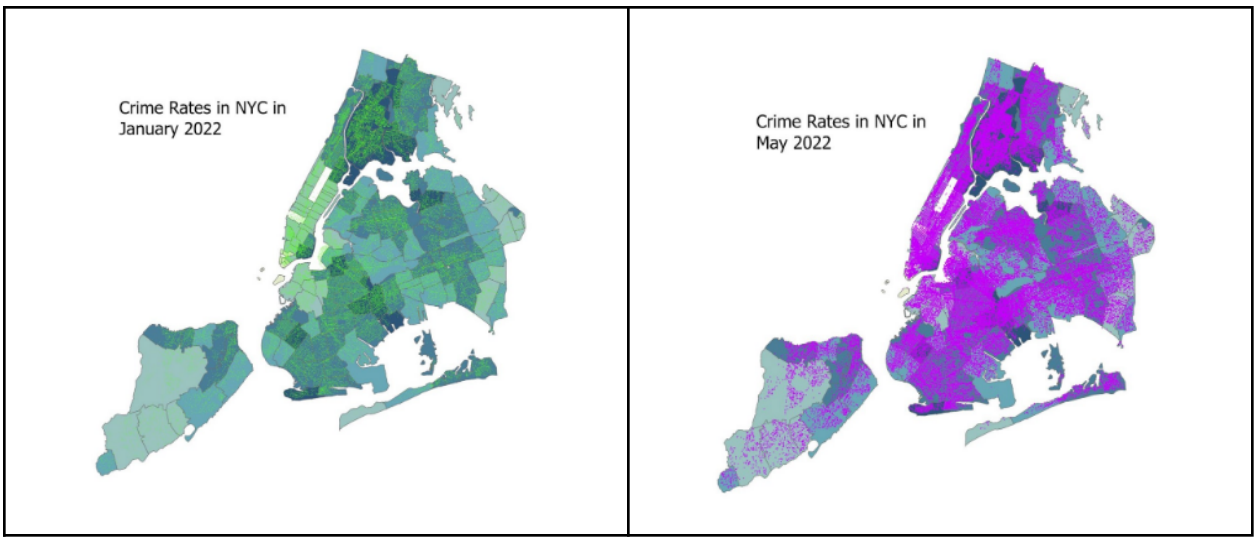
neighborhoods in New York City and their correlation with income levels. It highlights that neighborhoods with lower median household incomes often experience higher crime rates, creating a visual representation of economic and social disparities. The graph serves to emphasize how economic inequality can be geographically mapped alongside patterns of criminal activity.

The article *"Correlation Between NYC Crime Rates and Household Incomes"* by Emily Cheun, portrays millions of residents and workers, poverty and homelessness in New York City have been rising. Poverty has been common, but so have crime rates. Does NYC's crime rate have a relationship with household income? According to numerous studies, the rates of violent victimization are more than twice as high for those living in US homes with incomes below the federal poverty threshold as for those in high-income households. This presents a detailed analysis of how income inequality impacts crime rates across New York City neighborhoods. This graph illustrates a heatmap of NYC, highlighting regions with the highest crime occurrences, predominantly concentrated in lower-income areas such as parts of the Bronx and Brooklyn. Chuen and her colleagues state “From our research, we can conclude that there is a strong correlation between income inequality and crime rates.”



Another graph compares median household incomes across neighborhoods, showing stark disparities between wealthier areas like Manhattan's Upper East Side and poorer districts.

Additionally, a scatterplot visualizes the correlation between crime rates and income levels, with a clear trend indicating that areas with lower incomes experience higher incidences of crime. The final graph tracks changes in crime rates over time across various income brackets, showing that while crime has declined citywide, lower-income neighborhoods still bear a disproportionate share of criminal activity. Together, these visuals provide a comprehensive picture of the interplay between economic inequality and public safety in NYC.

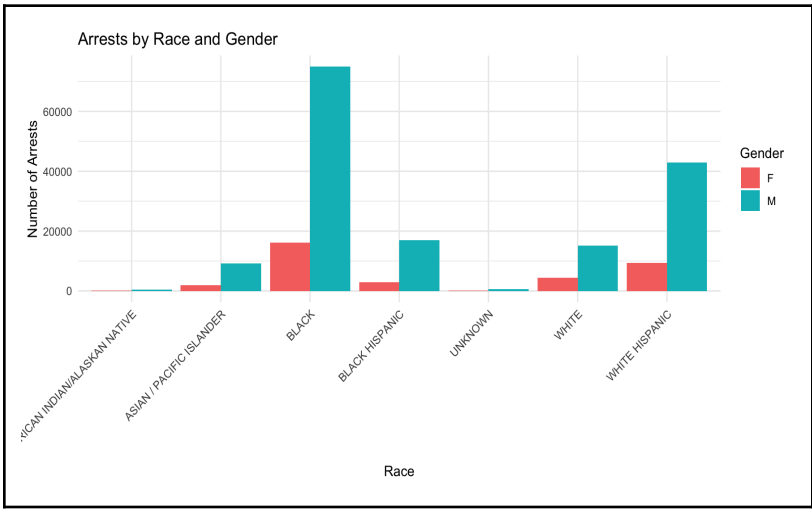


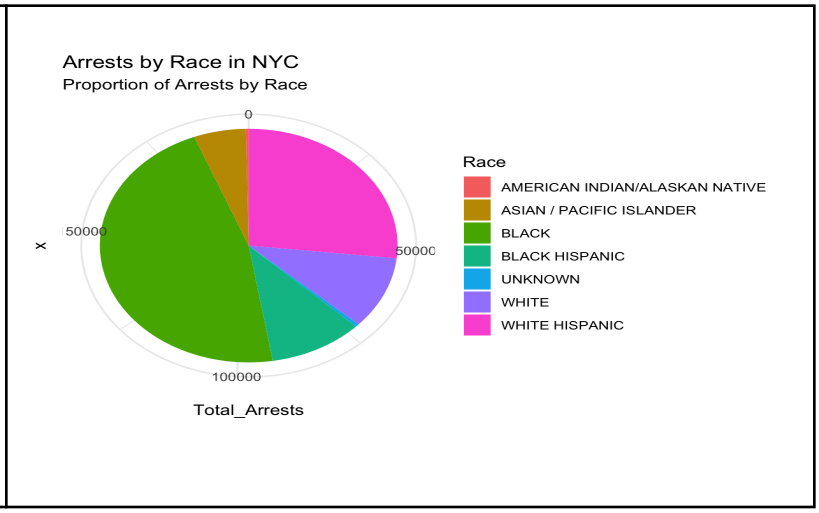
Shows a number of terrible crimes are on the rise in New York City and the country overall.

Research:

Originally the working hypothesis is that New York City boroughs with higher levels of crime rates have lower income inequality, and how it shows the ripple effect between each other, this research was furthered by looking at different aspects of crimes, and how it has been affecting New York City and its boroughs. The data that was used to obtain this information was the NYPD Arrest Data (2024). To begin with detailed data, we first analyze arrests by race and gender, The first analysis focused on the demographic breakdown of arrests by race and gender. Using the group_by() function in R, arrests were aggregated by race (PERP_RACE) and gender (PERP_SEX). A

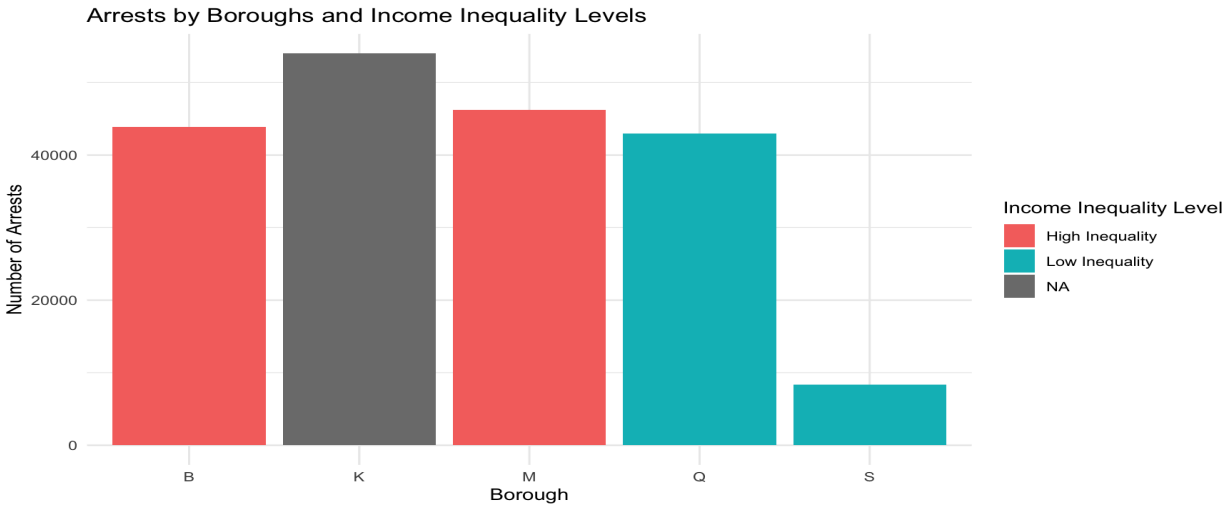
bar chart was created using ggplot2, where the x-axis represented race, the y-axis represented the number of arrests, and colors distinguished gender (Male and Female).





This visualization revealed disparities in arrests among racial and gender groups. Certain racial groups showed disproportionately higher arrest counts, highlighting the intersection of race, gender, and law enforcement in NYC. The revealing of this graph significant disparities in the number of arrests across racial and gender groups. Notably, Black people are the ones who get arrested the most; Black men (shown in teal) dominate this group with over 65,000 arrests, while Black women (shown in red) have a far lower amount, about 18,000 arrests. In a similar vein, White Hispanic men have a high arrest rate (over 40,000), but White Hispanic women have a significantly lower arrest rate (less than 10,000). This trend highlights a pronounced gender gap, where males in these racial categories are arrested at a much higher rate than their female counterparts. Other racial groups show comparatively lower numbers of arrests. For instance, Asian/Pacific Islanders and American Indian/Alaskan Native individuals have minimal arrests, regardless of gender. White individuals also display a noticeable gender disparity, with White males showing arrests around 20,000 while White females are much lower. The "Black

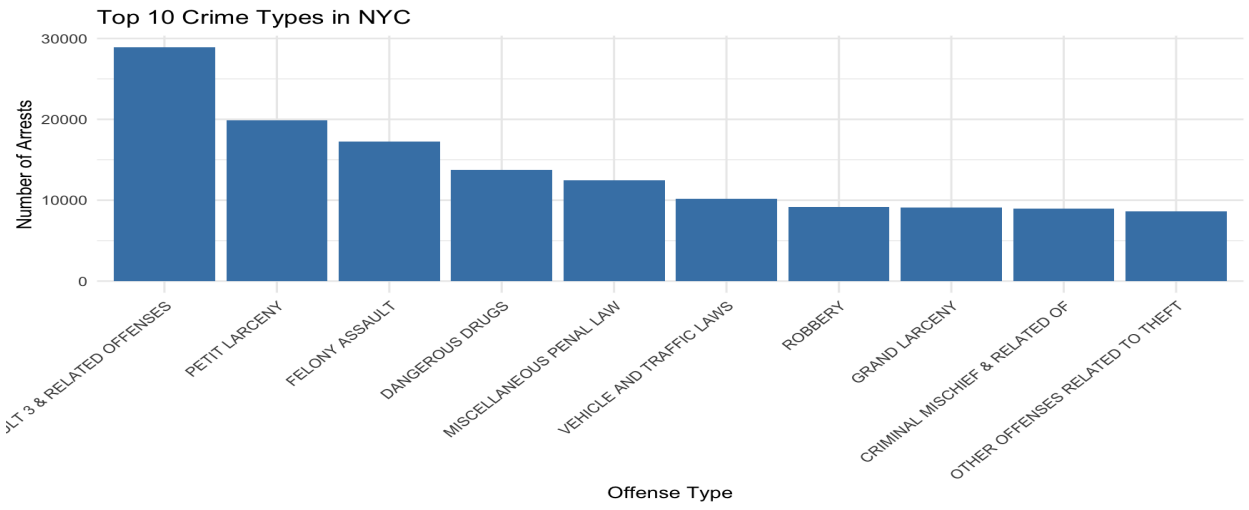
Hispanic" category further underscores the pattern of male predominance in arrests, though the totals are considerably lower than in the "Black" category. Additionally, the "Unknown" race category has negligible arrests overall. This graph underscores a clear correlation between race, gender, and arrest rates, with males, particularly in Black and White Hispanic groups, disproportionately represented in arrest data.



The graph titled *"Arrests by Boroughs and Income Inequality Levels"* provides a detailed breakdown of arrests across New York City's boroughs Bronx (B), Brooklyn (K), Manhattan (M), Queens (Q), and Staten Island (S) while highlighting levels of income inequality. Brooklyn has the highest number of arrests, represented in grey as "NA" (no income inequality data available), suggesting that despite its significant arrest numbers, detailed information on economic disparity in this borough is either incomplete or unavailable. The Bronx and Manhattan closely follow, both showing substantial arrest counts predominantly associated with high income inequality (red), indicating a clear relationship between economic disparity and elevated arrest levels. This highlights that boroughs with greater economic divides tend to report

higher crime-related arrests, which aligns with broader findings on socioeconomic inequality and crime rates.

In contrast, Queens and Staten Island present a noticeably different pattern. Queens shows a relatively lower number of arrests compared to Manhattan and Brooklyn, with arrests predominantly associated with low income inequality (teal). This suggests that areas with less pronounced economic disparity may experience fewer arrests overall. Staten Island , on the other hand, has the lowest arrest figures among all boroughs, and these arrests also fall under low income inequality. This disparity across boroughs reveals a significant trend: areas marked by high income inequality like the Bronx and Manhattan face disproportionately higher arrests, while boroughs with lower inequality, such as Queens and Staten Island, report fewer arrests. Brooklyn remains an outlier due to its unclassified income data but stands out with the highest arrest numbers overall. This graph underscores the critical role that income inequality plays in shaping arrest patterns across New York City.

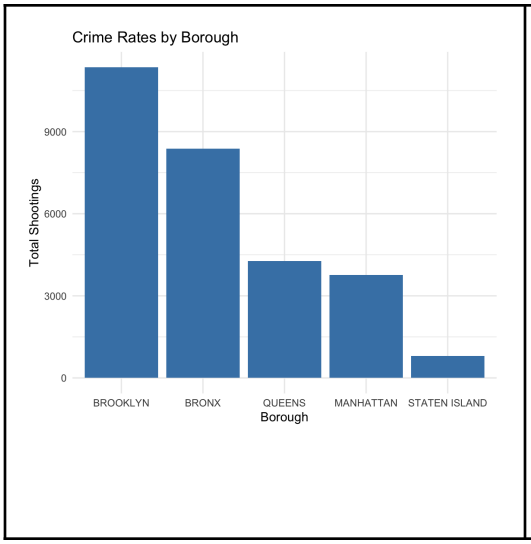


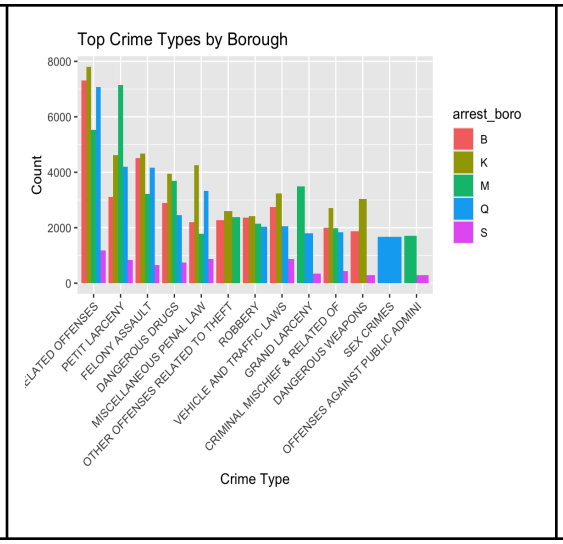
Before we get more into the specific comparisons, this graph "TheTop 10 Crime Types in NYC" shows the most common offenses that result in arrests in the city. Offenders most

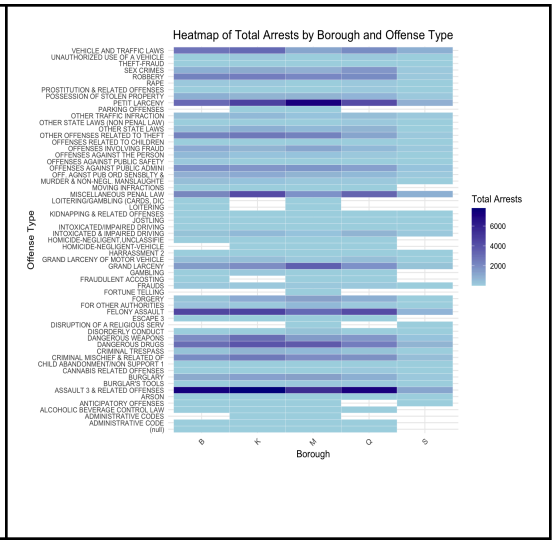
frequently arrested (more than 30,000) are charged with assault related charges.This category demonstrates the significant focus of law enforcement on addressing violent interactions and public safety risks. Following closely are petit larceny arrests, with just under 25,000 incidents, showcasing the widespread occurrence of theft-related activities, such as shoplifting or minor property thefts, in urban areas. These two categories together underline the dual emphasis on managing interpersonal violence and property-related crimes. The graph also sheds light on other key crime types, such as felony assaults and arrests for dangerous drugs, both of which exceed 15,000 incidents. The prominence of felony assaults highlights the presence of severe violent acts, while drug related arrests underscore ongoing efforts to tackle illegal substance possession or trafficking. Additionally, categories like miscellaneous penal law offenses and vehicle and traffic laws demonstrate a broader focus on maintaining order through penal code violations and road safety regulations, with arrests in both categories hovering around 12,000 to 14,000 incidents. As crimes like robbery, grand larceny, criminal mischief, and other offenses related to theft round out the top ten, each contributing over 10,000 arrests. These categories emphasize the diversity of theft and property-related offenses, alongside more specialized crimes such as vandalism and minor theft-related activities. Overall, the graph presents a comprehensive overview of the priorities in NYC's law enforcement, balancing efforts to manage violent crimes, property-related offenses, and regulatory infractions to maintain public order and safety.

This highlights how certain crimes may reflect underlying socioeconomic factors, including income inequality. For example, petit larceny, which accounts for the second-highest number of arrests, often correlates with economic hardship, as individuals in lower-income brackets may resort to petty theft to meet basic needs. Similarly, offenses involving dangerous drugs rank high, suggesting a link between economic disadvantage, substance abuse, and the

prevalence of drug-related arrests in economically struggling neighborhoods. Felony assault, which ranks third in arrest numbers, can also be viewed through the lens of income inequality, as neighborhoods with significant economic disparities often experience higher levels of stress, frustration, and conflict, potentially leading to violent incidents. Likewise, robbery and grand larceny, while lower in the rankings, are often motivated by financial desperation, which can be more common in areas with high income inequality.







The previous graph shows NYC as a whole, and the crimes the city has endured.This graph provides a detailed breakdown of shooting incidents across NYPD precincts, segmented by borough. Precincts in Brooklyn dominate the top of the chart, with several precincts recording over 1,500 total shootings. Precincts from the Bronx also show high numbers, but their totals are slightly lower than Brooklyn's leading precincts. In contrast, precincts from Queens, Manhattan, and Staten Island exhibit significantly fewer shootings. The Bronx and Brooklyn collectively account for the majority of shooting hotspots, indicating a strong concentration of firearm-related violence in these areas.A notable trend is the sharp decline in total shootings as the graph

progresses toward precincts with fewer incidents. This distribution reveals that while many precincts record shootings, a smaller subset of precincts consistently accounts for the majority of incidents. These high-shooting precincts are often located in neighborhoods characterized by socioeconomic challenges, such as income inequality and limited access to resources. The graph also shows that Staten Island precincts contribute minimally to shooting incidents, reflecting the borough's overall lower crime rates. The borough color coding highlights the geographic concentration of shootings, with Brooklyn and the Bronx heavily represented at the top of the graph. This suggests a correlation between precincts with high crime rates and specific boroughs facing greater socioeconomic disparities. This data could be used by law enforcement and policymakers to focus actions in regions where shooting rates are consistently high.

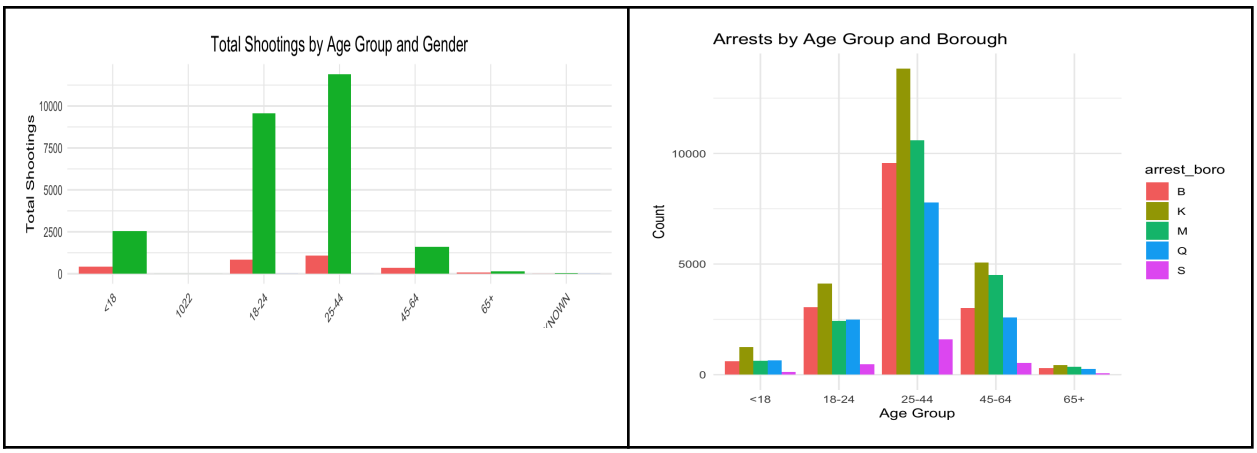
This graph aggregates the total number of shooting incidents in each of NYC's five boroughs, revealing significant variations. Given that the Bronx and Brooklyn have the highest shooting rates, respectively, it is likely that these two boroughs collectively are to blame for a sizable portion of New York City's gun violence. When combined, Brooklyn and the Bronx far outperform Queens, Manhattan, and Staten Island, indicating that places with higher population densities and socioeconomic difficulties are more likely to experience firearm-related violence. Queens and Manhattan show a moderate level of shooting incidents compared to Brooklyn and the Bronx. However, their totals are significantly lower, indicating that these boroughs experience relatively less gun violence. Staten Island, as expected, has the fewest shootings, reflecting its lower population density and distinct socio economic profile compared to the other boroughs. This trend aligns with Staten Island's generally lower crime rates and more suburban character.

The variations in shooting rates among boroughs are frequently related to community

infrastructure, unemployment, and income disparity. The graph highlights the need for focused crime reduction initiatives in the Bronx and Brooklyn, where funds might be used to address issues like poverty and a lack of employment opportunities that are major contributors to violence. It also draws attention to the fact that crime is not dispersed equally throughout the city, which is why borough-specific initiatives are essential to lowering overall crime rates.The *Heatmap of Total Arrests by Borough and Offense Type* connects directly to the insights derived from the previous graphs, particularly in illustrating how crime and socioeconomic disparities vary across New York City's boroughs. This heat map provides a detailed breakdown of the distribution of arrests by offense type and borough. Notably, Brooklyn and the Bronx , which were shown in earlier graphs as having high crime rates and significant concentrations of shootings, also dominate this heatmap in categories such as felony assault, petit larceny, and dangerous drugs. These categories align with the borough-specific trends of higher arrests in areas with greater socioeconomic challenges.

The heatmap's focus on offense types further complements the previous bar graphs by showcasing the types of crimes contributing most to borough-level crime rates. For instance, the prevalence of dangerous drugs and assault-related offenses in Brooklyn and the Bronx aligns with their higher overall crime and shooting rates. Conversely, Staten Island , which was shown to have the fewest shootings and lowest crime rates, also registers fewer arrests across most offense types, with no significant concentrations. This disparity reinforces the notion that socioeconomic inequality drives crime trends, as lower-income boroughs like the Bronx and Brooklyn are overrepresented in both the frequency and severity of arrests. This heat map also ties in with income inequality discussions from earlier graphs. Offenses like petit larceny and drug-related arrests are disproportionately represented in boroughs facing economic hardship,

reflecting how poverty and limited access to resources often lead to increased arrests for financially motivated crimes. The heatmap's visualization of offense distribution highlights the systemic nature of inequality, where certain boroughs not only face higher crime rates but also a wider variety of offenses, requiring targeted interventions tailored to both geographic and socioeconomic contexts. Together, the graphs offer a comprehensive picture of how crime, arrests, and economic inequality intersect in NYC.

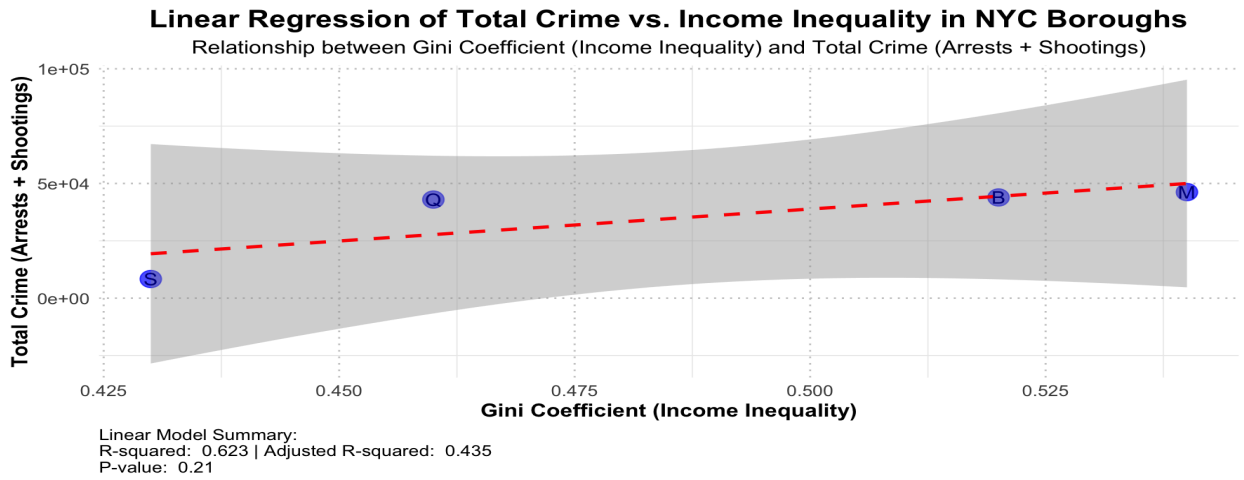


The first graph breaks down arrests by age group across NYC boroughs. It shows that individuals aged 25–44 account for the majority of arrests, with Brooklyn and the Bronx leading in this category. This trend highlights the prevalence of criminal activity among individuals in their prime working age, potentially reflecting socioeconomic pressures in these boroughs. The 18–24 age group also contributes significantly to arrest counts, with similar borough patterns, indicating that younger adults are disproportionately represented in criminal activity. In contrast, age groups under 18 and over 65 have notably fewer arrests across all boroughs. Staten Island consistently reports the lowest arrest counts across all age groups, aligning with its lower population density and crime rates observed in earlier graphs. The moderate arrest figures for individuals aged 45–64 suggest a declining trend in criminal behavior with age, potentially due to lifestyle changes or reduced exposure to risky environments.

Given that arrests are most common in Brooklyn and the Bronx, this graph emphasizes the necessity for concerted crime prevention initiatives aimed at younger demographics. The increased arrest rates for working-age people in these boroughs may be caused by socioeconomic issues including a lack of employment possibilities and high living expenses.

The second graph explores shooting incidents segmented by age group and gender. Males (green) aged 25–44 overwhelmingly dominate shooting incidents, with significantly higher counts than any other demographic. This is followed by males aged 18–24, reinforcing the pattern of young adult males being most involved in or affected by firearm-related violence. Females (red) account for a much smaller share of shootings across all age groups, highlighting a gender disparity in violent crimes.

Notably, shootings among individuals under 18 and over 65 are minimal, with males still comprising the majority within these age groups. This trend suggests that firearm-related violence is concentrated among younger to middle-aged men, potentially due to factors like gang involvement, economic stress, or neighborhood violence. Unknown gender data accounts for a negligible portion of the shootings, suggesting limited missing information in the dataset. The prevalence of shootings among young men highlights the significance of tackling underlying issues that disproportionately impact this group, such as structural injustices, lack of educational opportunities, and unemployment. Programs aimed at young adults and children who are at risk could contribute to a decrease in these figures, especially in areas where shootings occur often.



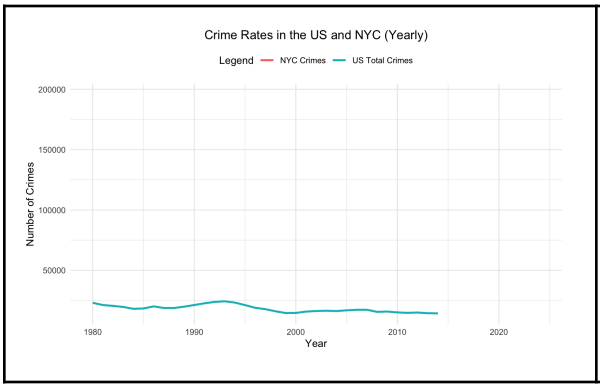
This graph illustrates the relationship between income inequality, represented by the Gini coefficient, and total crime arrests plus shootings across NYC boroughs. The Gini coefficient measures income inequality, with higher values indicating greater disparities in income distribution. The regression analysis shows a positive correlation between income inequality and total crime, as evidenced by the upward-sloping red dashed line. Boroughs such as Staten Island , which has a lower Gini coefficient, exhibit the lowest levels of total crime. In contrast, Manhattan and the Bronx , which have higher Gini coefficients, show significantly higher crime levels. This suggests that boroughs with greater income inequality experience higher rates of crime.

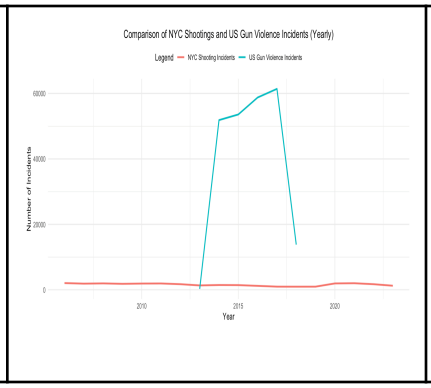
The p-value of 0.21 indicates the relationship between income inequality and total crime is not statistically significant. However, the moderately strong R-squared value (0.623) suggests that income inequality still explains a substantial portion of crime variance, warranting further exploration.The confidence interval, which is represented by the shaded gray area surrounding the regression line, widens near the extremes of the Gini coefficient, indicating greater uncertainty in the model's predictions at those values. All things considered, the graph shows

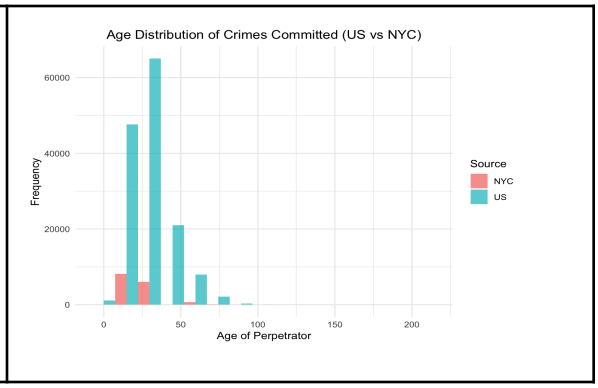
how wealth inequality may have an impact on crime, but it also emphasizes the need for more research to prove a statistically meaningful link.

NYC & U.S.:

Researching in New York is one thing, but as we open up our spectrum we then realize there are other states that endure criminal activities.







The stark difference between gun violence in NYC and the US as a whole is shown in the first graph, Comparison of NYC Shootings and US Gun Violence Incidents (Yearly). While gun violence in the US as a whole increased significantly between 2010 and 2016, reaching a high in 2016 before falling precipitously, shooting events in NYC have remained relatively steady over time, with only minor variations. This discrepancy is explained by NYC's stringent gun control legislation and aggressive law enforcement tactics, which stand in stark contrast to the rest of the US, where state gun laws differ greatly. Even while gun violence is on the rise nationwide, NYC's low and steady gunshot rates demonstrate how well the city regulates firearms.

The second graph, *Crime Rates in the US and NYC (Yearly)*, showcases a broader picture of overall crime trends. Both NYC and the US demonstrate a steady decline in crime rates over the decades, but NYC's decline is steeper, particularly during the 1990s. This period coincides with significant law enforcement innovations in NYC, such as the introduction of the CompStat

program and a shift toward community policing. These localized efforts allowed NYC to address crime more efficiently than many other parts of the country, resulting in a sharp reduction in crime rates compared to the slower and less pronounced decline seen nationwide. The data suggests that while crime prevention strategies have improved overall, NYC has been particularly successful in implementing impactful reforms.

The third graph, *Age Distribution of Crimes Committed (US vs NYC)*, underscores a demographic difference in crime patterns between NYC and the US. In both cases, the majority of crimes are committed by individuals aged 25–44, followed by the 18–24 age group. However, NYC shows a sharper concentration of criminal activity among these younger groups, while the US displays a broader distribution, with a more substantial proportion of crimes committed by individuals aged 45 and above. This difference reflects systemic factors, such as NYC's dense urban environment, where younger populations face higher unemployment rates, socioeconomic pressures, and exposure to violence. In contrast, the broader US data likely captures rural crime patterns and regional variations, where older individuals contribute more significantly to crime statistics. These findings highlight the importance of targeted interventions for at-risk youth and young adults in NYC to address the root causes of crime in urban settings.

The NYC-focused graphs consistently show lower crime rates, shootings, and a sharper concentration of criminal activity among younger age groups compared to the national data. These differences can largely be attributed to NYC's localized policies, such as stricter gun control, targeted community interventions, and robust law enforcement programs like CompStat. In contrast, national data reflects broader systemic challenges, including varying state laws, rural-urban differences, and less consistent enforcement.

For instance, the NYC heatmap of arrests by borough and offense type illustrates the localized impact of socioeconomic disparities, with neighborhoods in Brooklyn and the Bronx disproportionately contributing to crime rates. This pattern is less pronounced in national data, which exhibits a broader and more evenly distributed age and crime type profile. The national spike in gun violence incidents around 2016 further highlights the fragmented nature of gun control policies, contrasting sharply with NYC's relatively stable trends. These comparisons underscore the importance of addressing both local and systemic factors. While NYC's success demonstrates the efficacy of targeted, urban-focused policies, bridging the gap with national trends requires coordinated efforts to tackle socioeconomic disparities, inconsistent regulations, and systemic challenges on a broader scale.

Conclusion:

In conclusion, the data reveals a strong correlation between socioeconomic factors, such as income inequality and age demographics, and crime trends in New York City. Boroughs with higher levels of income disparity, such as Brooklyn and the Bronx, consistently show elevated crime and arrest rates, particularly for offenses like shootings, felony assault, and petit larceny. Comparisons between NYC and national data emphasize the city's unique crime patterns, with its sharper concentration of criminal activity among younger age groups and significantly lower overall gun violence due to stricter local policies.The results lend credence to the idea that targeted demographics and socioeconomic disparities are major causes of crime, highlighting the necessity of interventions like better access to economic opportunities, education, and community-focused initiatives to address systemic injustices and lower crime rates. This study serves as a reminder of the larger difficulties in combating crime on a national level as well as a case study of successful localized crime prevention in New York City.

Works Cited:

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