Crime Rates and Socioeconomic Factors in U.S. Cities

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Hypothesis

Socioeconomic factors, such as income and cost of living, are often compared to crime rates in a variety of ways. Understanding how these factors influence crime rates in cities is essential for creating safer and more prosperous communities. In this report, we hypothesize that cities with higher median family incomes will also have lower crime rates, compared to cities with lower median family incomes.

Data

We gathered data from several sources to create a database of information for cities in the United States. We used data from SimpleMaps (population and density), the Economic Policy Institute (cost of living), and the Federal Bureau of Investigation (crime). For measuring cost of living, we used the data for a family of two parents and two children, and kept record of housing cost, food cost, transportation cost, healthcare cost, other necessities cost, taxes, total cost, and median family income. For crime, we used the 2019 data for the number of each type of reported crime: violent crime, murder, rape, robbery, aggravated assault, property crime, burglary, larceny/theft, and motor vehicle theft.

Findings

Claim #1: Cities with higher median family incomes will have lower crime rates.

This claim was our first hypothesis, and we found only partially significant evidence to support it. The results from the t-test suggested a non-significant trend (t= -0.5475, p=0.5841) where cities with above-average median family incomes tend to have lower crime rates. Breaking income and crime rate into two categories, however, resulted in a Chi-squared test that indicated a significant association (χ^2=58.84, p<.01) between income levels and crime rate categories, suggesting some dependency between economic status and crime rates.

Claim #2: Cities with a higher number of property crimes also have higher housing costs.

Unsatisfied by the confirmation of our first claim, we decided to look at more closely related crime and cost of living data, focusing on property and housing. We broke property crime and housing costs into three even groups of "high", "medium", and "low" values. A Chi-squared test revealed a significant association (χ^2=451.93, p<.01), which suggests that areas with different levels of property crime also exhibit distinct patterns of housing cost, and vice versa.

Claim #3: Our collected data can be used to predict the total cost of living in a city.

We used a linear regression for our machine learning component to predict the total cost of living of a city based on the other attributes from our dataset. We created a "random baseline" (which chooses a random number within the possible range) for comparison, since the MSE appears large due to the scale of the data.

Model	MSE	R^2
Random (Baseline)	2,445,948,567.46	-10.157
Our Model	7,007,533.61	0.968

Summary of Relevant Research

Previous research, such as that by Groot and van den Brink (2010), suggests that education can significantly impact crime rates, providing a valuable insight into preventive strategies. Studies by Sugiharti et al. (2023) elaborate on the intricate relationship between poverty, income inequality, and crime, reinforcing the need for comprehensive economic and social policies. The work of Ceccato and Wilhelmsson (2020) on crime hotspots and property values highlights the direct economic impacts of crime, influencing urban property markets and housing policies. This body of research underscores the complexity of factors influencing crime and suggests targeted areas for policy intervention and community engagement to address these multifaceted issues.

Socio-historical Context

The research into the relationships between socio-economic factors, population density, crime rates, and housing values delves into an intricate web of social dynamics that span decades, if not centuries. Studies have consistently shown that urban development, influenced by a myriad of policies and economic forces, has significant impacts on social structures, which directly correlates with crime occurrence and property values (Ceccato & Wilhelmsson, 2020). For instance, historical policies like redlining have not only segregated cities but have had lasting impacts on the economic opportunities available to residents, thereby influencing current crime rates and housing market dynamics (Massey & Denton, 1993).

The stakeholders in this research are diverse and include urban planners, city councils, law enforcement, real estate investors, community development groups, and the residents themselves. Each of these groups has a vested interest in understanding the dynamics between socio-economic status and urban safety. Policymakers, for instance, could use insights from this research to draft policies that aim to improve socio-economic equity and reduce crime rates simultaneously.

Further studies, such as those by Sampson and Raudenbush (1999), discuss how social cohesion and trust within communities can significantly deter crime, suggesting that crime rates could also serve as indicators of community health and social capital, rather than just economic or demographic failures. This broadens the potential application of our findings, emphasizing the importance of socio-cultural factors in urban planning and public policy.

The socio-historical research findings significantly impact how we approach this project:

- **Question Formulation:** Recognizing the enduring impacts of urban policies aids in crafting questions that aim not just to find correlations, but also to delve into the root causes and consider possible policy interventions.
- **Analyzing Data:** This analysis should include longitudinal studies and potentially multivariable regression models that consider historical disparities, providing a more comprehensive insight into the ongoing urban challenges.
- **Interpretation of Findings**: Given the historical complexities, findings should be interpreted with an understanding that socio-economic dynamics are deeply intertwined with historical urban policies and current administrative practices.

- **Presentation of Results**: The results should be presented in a manner that promotes understanding and advocacy for equitable urban development, highlighting the need for inclusive policies that address the root causes of crime and economic disparity.

Ethical considerations are paramount, especially when dealing with data that reflect socio-economic disparities and could influence public perception and policy:c

- **Historical Context and Bias in Crime Data:** Crime and economic status data often carry historical biases that can lead to stereotype reinforcement if not meticulously examined and presented. To counteract these biases, it's crucial to employ sophisticated statistical methods and ensure the research team represents a range of perspectives (Harrell, 2003).
- **Bias in Crime Data Collection Methods:** The techniques used to gather crime and economic statistics may inherently favor certain outcomes. For example, areas under heavier surveillance may report more incidents of crime, which does not necessarily indicate a higher rate of crime but rather more frequent detection (Fagan & Davies, 2000).
- **Counteracting Interpretation Bias in Research:** Researchers need to be conscious of personal biases that might color the interpretation of data. Involving community stakeholders and adopting Community-Based Participatory Research (CBPR) methods can effectively reduce these biases and enhance the relevance of research outcomes (Minkler & Wallerstein, 2008).
- **Data Privacy and Community Stigma:** While aggregating data at the neighborhood level can help protect individual privacy, it may inadvertently lead to the stigmatization of specific areas. It is essential for researchers to find a balance in data detail that minimizes potential harm.
- **Avoiding Misuse and Misinterpretation of Research Findings:** It is vital to prevent the misuse or misinterpretation of research findings, especially those that could support severe policing tactics or biased policies. All results should be clearly communicated with an emphasis on their limitations and the specific contexts in which they apply (Lum & Koper, 2017).
- **Ethical Standards in Data Utilization:** It is imperative that the usage of any data strictly adheres to ethical guidelines and respects the privacy and agency of the individuals and communities involved. This requires maintaining transparency about data collection, storage, and usage practices and ensuring compliance with all relevant ethical and legal standards. storage, and usage policies that comply with ethical standards and legal requirements.

Works Cited

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- **Lum, C., & Koper, C. S. (2017).** *Evidence-Based Policing: Translating Research into Practice.* Oxford University Press. This book promotes evidence-based methodologies to improve policing effectiveness and fairness.
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