

Economic Impact on Crime in Chicago

Harper Chen, Jeff Mason, Brendan McDonnell

Description

Datasets include daily crime reports for the city of Chicago and economic data for the city of Chicago

Questions:

- Do economic factors appear to have a relationship with the crime rate within Chicago?
 - GDP
 - Unemployment Rate
 - Poverty Rate
 - Inflation
- Do economic factors have an impact on the type of crime?
 - Property Crimes
 - Violent Crimes
- Do economic factors disproportionately impact crime rates based on location?
 - Inner city
 - Outskirts of city

Prior Work

- An Analysis of the Suspect: The Impact of Economic Conditions on Crime
 - Study observing economic conditions impact on crime rates within US
 - Indicated that GDP and unemployment rate were not statistically significant in relation to any type of crime rate
 - Overall economic conditions do have an effect on crime rates, particularly property crime
 - <https://scholarworks.uark.edu/cgi/viewcontent.cgi?article=1040&context=econuht>
- The Impact of Economic Activity on Criminal Behavior: Evidence from the Fracking Boom
 - Study observing the economic uplift of opening of the fracking industry in North Dakota and it's impact on crime
 - Study showed initial decrease in crime associated with increasing positive economic conditions, but an eventual re-increase in crime without an economic downturn associated
 - <https://www.thecgo.org/research/the-impact-of-economic-activity-on-criminal-behavior-evidence-from-the-fracking-boom/>

Dataset Information

- Chicago Crime
 - ~7 million data points
 - Tracks reported incidents of crime in Chicago metro area starting in 2001
 - <https://www.kaggle.com/datasets/chicago/chicago-crime>
 - Data Source: City of Chicago
- GDP of the Chicago Metro Area
 - Tracks yearly GDP of Chicago metro area (adjusted to 2012 dollars) since 2001
 - <https://www.statista.com/statistics/183827/gdp-of-the-chicago-metro-area/>
 - Data Source: City of Chicago
- Chicago IL, Unemployment Rate
 - Tracks monthly Chicago unemployment rate since 2001
 - <https://data.bls.gov/pdq/SurveyOutputServlet>
 - Data Source: Bureau of Labor Statistics
- Datasets located on all members computers and github repository

Proposed Work

- Data Cleaning
 - Removal of any entries with null values for data being tested
- Data Integration
 - Integration of data sets together via date timestamps
- Data Reduction
 - Reduction in total size of data set via limiting timeline
 - Reduction in some attributes not being tested ex. Case number, police beat, lat/long
- Data Transformation
 - Transform dates to month-year format for easier aggregation and analysis
 - Group types of crimes into fewer categories (Violent crimes, property crimes etc)
- Data Analysis
 - Testing or variable relationships via regressions, scatter plots, line graphs etc.

List of Tools

- Python
 - Pandas
 - Data Cleaning and General Data Wrangling
 - Stats
 - Viewing in-depth insights and utilizing advanced algorithms
 - Matplotlib
 - Visualizing and Presenting our Results
- SQL
 - Querying Data
- Tableau
 - Additional options for data visualizations
- Powerpoint
 - Conveying findings in a clear and concise manner to our audience
- Discord and Zoom
 - Group communication

Evaluations:

1. The Chicago crime dataset can help identify any correlation between crime rates and economic indicators.
2. Economic analysis of the Chicago crime dataset can help estimate the cost of crime in Chicago.
3. Analyzing the Chicago Crime dataset at the neighborhood level can identify areas of the city that are particularly vulnerable to crime.
4. The dataset can help to identify the economic impact of crimes committed against businesses.
5. The dataset can inform policies aimed at reducing crime through economic development.
6. Further analysis may be required to identify additional factors that contribute to crime rates in Chicago.
7. It is important to consider limitations and biases in the data when interpreting results.
8. Additional data sources and analysis methods may be needed for a more complete understanding of the relationship between crime rates and economic indicators in Chicago.