

**The Effects of Poverty on Crime Rates (LA)**

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CIS 4540

17 May 2021

**Abstract:**

Despite a large body of research showing that poverty has an aggregate effect on violence, there is still debate about whether job loss affects illegal activity. The central position of incentives in seminal economic theories of crime demonstrates how important it is for economists to understand what incentives influence crime. For example, crime rates can impact mayors' approval ratings, so causal assessment of the determinants of crime is a crucial focus for policymakers. The unemployment and crime literature contains ample examples on both major and minor effects of unemployment on major and individual crimes in the United States (Phillips and Land 2012), (Bennett and Quazad 2016.

Our study sets a focus on poverty rates to see whether there is a connection between income inequality and violence. Our preliminary findings point to a very correlated link between work displacement and violence. This effect is mostly motivated by the effect of work loss on property crimes, which show increasing trends on average across the workforce, and is economically and statistically important up to a certain degree until the affected group bounces back. Similar to recent literature, the effect on crime is influenced by those with low qualifications, high school or less and, to a lesser degree, technical education; while those areas with university education report no changes in crime.

**Literature Review:**

*Julie Phillips, Kenneth C. Land,*

*The link between unemployment and crime rate fluctuations: An analysis at the county, state, and national levels, Social Science Research, Volume 41, Issue 3, 2012*

Cantor and Land (1985) developed a theoretical model that proposed two pathways through which economic activity – as indexed by the aggregate unemployment rate – could affect the rate of criminal activity

* Aggregate unemployment rates affect levels of criminal motivation and opportunities.
* Model was examined using data on seven index crimes for US counties from 1979-2005
* Explored how results change when county data are combined to state and national levels
* Temporary unemployment reduces crime; sustained unemployment raises crime

*Patrick Bennett, Amine Ouazad*

*The relationship between job displacement and crime, 29 October 2016*

Becker (1968) argues that a core driver of criminal behavior is an individual comparison of the benefits and costs of committing crime. Area-wide assessments of the influence of unemployment rates on overall crime rates capture both direct and spillover impacts of individual unemployment on crime; a key issue is determining how much of this aggregate association between unemployment and crime rates is related to the direct impact of individual unemployment on crime.

* Strong relationship between job displacement and crime
* Displaced individuals are significantly more likely to commit a crime which leads to a conviction post-displacement, but not in the time leading up to displacement.
* The impact on crime is driven by those with low education – where those with university education experience no increases in crime post-displacement.

**Research Question:**

1. Is there a relationship between violent crimes and poverty in Los Angeles?

2. Where are the violent crime hot spots?

3. Where are the City's most vulnerable neighborhoods?

Los Angeles’ labor force has recorded enormous level decline in labor force just before the latest round of business restrictions and closures in previous months as COVID cases and hospitalizations spiked into peak numbers. The socioeconomic disadvantages play a role in minimizing the quality of life in a community and therefore promote the likelihood of a crime occurring. Citing such studies linking income inequality and violent crimes will put the necessary pressure needed for state officials to target locations with the proper interventions and reduce violent crime in poverty-stricken areas.

The development of heat maps and infrastructure-related data will be especially useful for government planners and LAPD for monitoring violent crime rates in the Los Angeles area. One of the advantages of analyzing Unemployment and Crime Rates are that the results can be disaggregated and used to build charts. These maps provide an instant interpretation of where crimes are most severe and where solutions are most required.

**Relevant Data Sources:**

Because we are interested in violent crime, we must collect data for homicides, rape, robbery, aggravated assault, aggravated battery, suicide, domestic violence, and child abuse incidents over the past year. We must look for this data from Los Angeles Police Department, titled Crime Data from 2020 to Present. Here we will find:

* No. of Homicides
* No. of Arson
* No. of Robbery
* No. of Assaults

Another instance we are interested in are household median income and household gross rent values. For this data we must look at US Census Bureau for Los Angeles city and jot down the local income distribution and percentage in which have a college education. Here we will find:

* Median Household Income
* Median Gross Rent
* % with Bachelor’s Degree

For unemployment data we must look at the Bureau of Labor Statistics’ Monthly Unemployment Statistics program to gauge how many people. Here we will find:

* Unemployment Rate (%)
* Count of unemployed population
* Count of employed population
* Count of people in the labor force (employed + unemployed) Data

Data collection was simple and straightforward. Most data needed was readily available to public through government sites and bureau consensus. Data was downloaded and imported directly into ArcGIS Pro via shapefiles or layers. Problems encountered ranged from file integrity issues and incorrect file type that prevented imports. Alternative methods included trying the website version of ArcGIS but the tools provided proved to be a little too limiting and hindered the overall data analysis.

**System:**

The analysis was conducted on very specific hardware. I wanted to make sure that analyzing the given dataset would not be straining my main computer. Therefore, I opted in optimizing results by using the hardware specifications below to ensure a smooth process when analyzing the map. Excel was used to clean raw data and fix certain labeling that would cause issues with categorizing the data. ArcGIS Pro is our main software used to analyze and build map models to help us understand the data and create a narrative.

Hardware Specifications included:

* CPU: Intel® Core™ i7-8700K Processor (6x 3.70GHz/12MB L3 Cache)
* GPU: NVIDIA GeForce GTX 1080 - 8GB (GDDR5X) (VR-Ready)
* Memory: 16 GB [8 GB x2] DDR4-2666 Memory Module
* HDD: 1TB hard drive and 240GB solid state drive (SSD)

Computer Software Used:

* ArcGIS Pro
* Excel

**Geospatial Tools/Methods:**

(Hot Spot Analysis, heat map) to show where in the city is the most vulnerable neighborhoods.

(Figure 1)

Map

Description automatically generated

(Space-time pattern mining) to show areas with intensifying or persistent violent crime and high unemployment rates.

(Figure 2)

Map

Description automatically generated

(3D density map) to show areas with high densities of violent crime.

(Figure 3)

Map

Description automatically generated

**Expected Analysis:**

Analysis is expected to show us a strong influence of violent crime as result of the disparities between neighborhood incomes and lower education. Potential factors were everywhere in such a chaotic year and hopefully we can find the answer to whether violence would return to COVID trends until vaccines are widely available and city begins to open.

**Results:**

To determine whether the effect of labor loss on crime is greater or lower in places of deprivation or poverty, we integrate our recognition approach using levels of education and crime rates with local indices of income inequality and poverty concentration. Greater deprivation and poverty exacerbate the effect of workplace loss on property crime in the immediate aftermath, with the impact of lower income areas providing the most fuel to crime infested neighborhoods. There are a variety of areas with intensifying violent crime hot points, as well as several locations with constant hot spots. Consecutive hot spots are concerning; there are hot spot sites that have been statistically important over several time spans recently.

In (Figure 1) we can observe the general hot spots along with the cold spots with 99%, 95%, and 90% intervals. It is safe to assume most vulnerable neighborhoods lay in the heart of Los Angeles. In (Figure 2) we further strengthen this analysis by observing that most household median income are generally less in the area that showed the greatest hot spot for crime rates. Furthermore, the amount of people holding a college degree in those neighborhoods are also quite lower than in the darker shaded neighborhoods that earn a larger household income. In (Figure 3) we can better see the concentration of violence in the Los Angeles area and correlate it with the neighborhoods that are struggling with poverty.

**Conclusion:**

Our research shows that income inequalities have a direct effect on violence rates in Los Angeles. Beyond the effects on the working man, poverty-stricken crime has a societal impact. Such findings in a world with comparatively low crime rates and, at the time of study, generous unemployment insurance mean that job loss has a significant net effect on crime. I grew to understand the importance of spatial science and how it plays a significant role in benefiting the community. The potential of such software can help us build stronger strategies to improve our city and develop new ways of moving forward through unique data-driven guidelines. This project has demonstrated the applications for map analysis in uncovering the hidden stories behind all the big data we are constantly collecting.

**References**

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