

Research proposal idea - Economic local spillover effects of public housing demolition

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1 Introduction

Housing is an essential issue in modern societies, where even despite holding a full-time job, people struggle to pay rent. According to The Census Bureau, 13 percent of households in the United States struggle to catch up on rent [US Census, 2023]. One form of support is providing low-income housing by the state. However, the governments often decide to build a whole neighbourhood of low-income housing, which, under poor maintenance worsen dramatically. This led to an increase in crime in these areas [Popkin, 2000].

The demolition of public housing in Chicago between 1999 and 2010 was part of a broader effort to address issues related to concentrated poverty, crime, and the physical deterioration of public housing developments. The Chicago Housing Authority (CHA) implemented a plan called the "Plan for Transformation," which aimed to revitalize the city's public housing stock.

Residents of the demolished public housing developments were typically offered the opportunity to relocate to other public housing units or were provided with housing vouchers to help them secure housing in the private market. The goal was to give residents more choices and opportunities for better living conditions. However, the process was not without challenges, and some residents faced difficulties in finding suitable housing or experienced displacement from their original communities.

While the intention was to improve living conditions and create more vibrant neighborhoods, the Plan for Transformation has been criticized for its impact on the displaced residents, the loss of affordable housing units, and the social disruption caused by the demolition of longstanding communities.

There has been studies showing that the housing demolition program led to a decrease in crime rates in the neighbouring areas[Sandler, 2017], as well as the effect of displacement of the people subjected to eviction on violent crimes.

However, I find this mechanism invalid. First, there is no straight pattern indicating that public housing areas are affected by crime in a larger degree as per figure 1. Second, as long as I understand the group effect of organized crime, from an economic perspective, the only change there was provided to the people is depriving them of housing. That should increase their motivation to commit

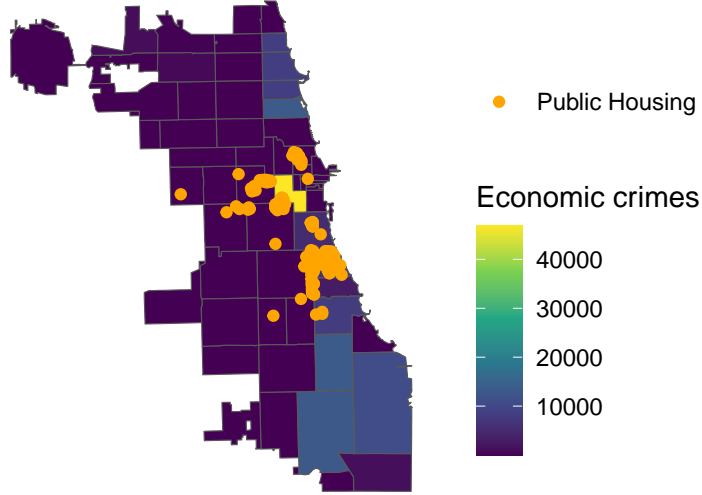


Figure 1: Economic crimes intensity and public housing in Chicago.

economic crimes as their material status worsens. This reasoning is supported by [Bruhn, 2017] showing that the long-term consequences of demolishing public housing actually led to increase in crime rates in the whole city, as previous estimates had been biased by the spillover effects associated to local areas. The change in structure of crimes is also studied but only including violent crimes in [Aliprantis and Hartley, 2015]. The analysis shows great decrease in violent crime rates outweighing the rise in different neighbourhoods as of displacement.

In this proposal, I attempt to answer a research question of an impact of public housing demolition on the structure of crimes. Do displaced citizens show higher motivation towards economic crime and lower towards organized crime?

I propose a strategy based on relocation decisions of the displaced individuals. If we follow the statement of higher crime rates among public housing areas, those displaced individuals, who now have more incentives to commit economic crimes, are more likely to commit them. A treatment-control grouping based on distance as in [Sandler, 2017] is not convincing as we can expect that the relocation decisions rely strongly on rent prices. Instead, I follow low-rent areas to study crime evolution.

Nevertheless, I am unable to find any straight pattern between economic crimes and public housing demolition, both in the treated and controlled areas. Examining distance-based and using income as a proxy for rent prices, the trends appear not strong enough to conclude.

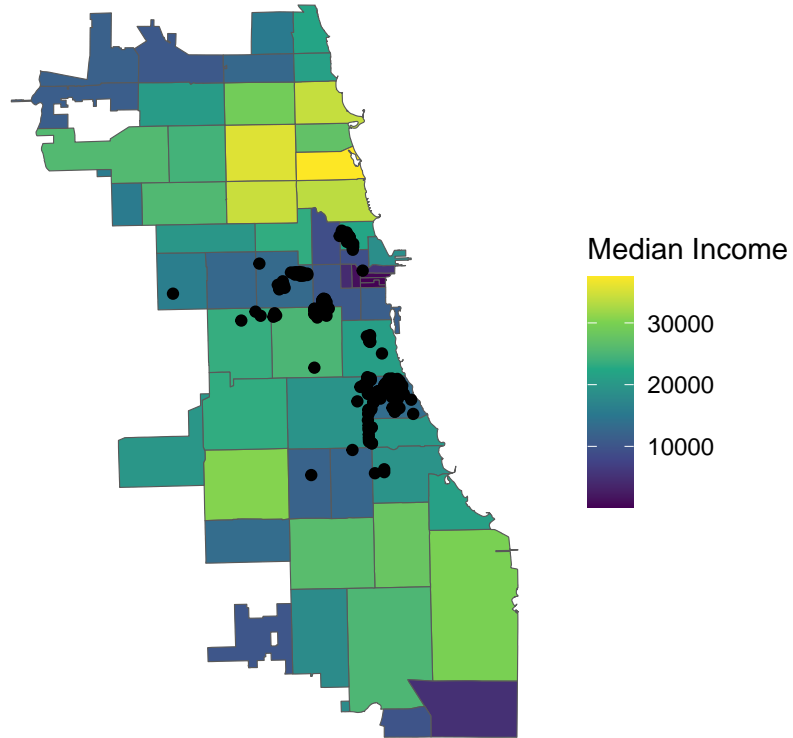


Figure 2: Source: Median income and Public Housing Demolition. Demolitions data from 1999 to 2010. Income data from 2011. Source: data.census.gov, [Sandler, 2017]

2 Proposed strategy

Research design

The idea behind is to search for changes in crime rates in other neighbourhoods in Chicago. First, we'd use the information about relocation of demolished housing inhabitants. In the preliminary study I assume these neighbourhoods to be ones with the lowest rent. Opposed to [Sandler, 2017], I reject the approach based on the distance from the demolition. I recognize high mobility of the citizens as an important aspect of the analysis, allowing to reflect the reality more, as displaced individuals' material status might not allow them to move to the nearest neighbourhood. Here, for the proxy of rent I'm using average income of ZIP code areas. After identification of the neighbourhoods with the highest relocation rates from the demolished areas, we have to pick a threshold

which would allow us to identify the treatment and control group. Treatment neighbourhoods would be the ones with highest number of relocated from public housing. However, we have to be careful when picking the control group, as we expect some spillover effects of crime, widely documented and even shown in [Sandler, 2017]. Therefore, our criterion would be relocation rate of public housing inhabitants close to 0, and a distance of at least 1 neighbourhood from the treatment neighbourhood. To conduct the study, we have to make sure two other assumptions are fulfilled.

- **No-anticipation assumption**

We have to ensure that people don't commit crimes before they have an economic motive to do so. It is quite credible that unless very unfavorable economic conditions are in place, the agent does not commit an economic crime. We assume that people have to be pushed to commit an economic crime, being rational, and they do not take action even when anticipating the future poor financial situation. Therefore, they would not commit the crime before leaving the public unit and facing heavier economic situation. When there's little economic literature concerning this issue, it is testable empirically. We could retrieve information about economic crimes of the citizens evicted and about to be evicted from public housing and show if they take action when anticipating the demolition.

- **Parallel trends assumption**

We have to check whether the time trends in both, treatment and control group are the same before the demolition happens. This is testable using the data. We focus on the trend, that is the growth of crimes, in our case economic crimes.

After fulfilling these assumptions, we can proceed to our methodology, that is two-way fixed effect regression.

$$Y_{g,t} = \sum_{g'=1}^G \hat{\alpha}_{g'} 1\{g = g'\} + \sum_{t'=1}^T \hat{\gamma}_{t'} 1\{t = t'\} + \hat{\beta}^{fe} D_{g,t} + \hat{\epsilon}_{g,t} \quad (1)$$

Where $Y_{g,t}$ is economically motivated crime rate in neighbourhood g at time t , α captures location fixed effects, γ time fixed effects. $\hat{\beta}^{fe}$ is a TWFE estimator capturing the exogenous difference caused by the demolition of housing, under the assumptions mentioned above.

A problem we are facing using this method is identification of the moment of treatment. The public housing units are demolished continuously and there are few moments where we have large groups evicted at the same time. We have to pick a frequency and a threshold which allows us to identify those moments. For example, if we pick 'month' as a frequency, we identify the time of the event as the month with number of units larger than x , the threshold.

Other method to use would be to identify the intensity of treatment. As in [Clemens et al., 2018], we would identify the most exposed areas as the ones

with lowest rent prices before the eviction.

$$Y_{g,t} = \sum_{g'=1}^G \hat{\alpha}_{g'} 1\{g = g'\} + \sum_{t'=1}^T \hat{\gamma}_{t'} 1\{t = t'\} + \hat{\beta}^{fe}(I_{t \geq t'} \bar{p}_g^{t'} + \hat{\epsilon}_{g,t} \quad (2)$$

Where $Y_{g,t}$ is economically motivated crime rate in neighbourhood g at time t , α captures location fixed effects, γ time fixed effects. $I_{t \geq t'}$ is the time of demolition that passes the threshold. To overcome the often lifted criticism on the mentioned paper using the average labor intensity on monthly level when regressing on quarterly data on wages, we would use monthly rent price data. We would expect $\hat{\beta}^{fe}$ to have a positive sign in the neighbourhoods more strongly affected by the evictions. That is - lower price would correspond to higher β . Assuming that trends in the outcome would have been similar in the neighbourhoods most affected by exclusion to trends in unaffected neighbourhoods had the demolition not occurred, the estimate β^{fe} captures the effect of demolition.

As the demolition in Chicago was a long process, we would have to run multiple regressions. Then, our estimates could reflect the effect of public housing demolition. We would not expect big estimates, however, adding up the regression would show real effects of the demolitions.

3 Preliminary results

3.1 Data description

The data can be found as a part of the replication package of [Sandler, 2017]. It contains detailed block-level crime data committed in Chicago from 1999 to 2010. It is supported by the data on public housing demolitions in that time. The study merges data from The Chicago Housing Authority on public housing demolitions, geolocation and the crime data from the Chicago Police Department on block-level.

The data covers years from 1999 to 2010. It contains data on description of crime, date and place (address of it). We have over 2 million crimes, classified in 10 categories:

1. "MOTOR VEHICLE THEFT"
2. "ARSON"
3. "CRIMINAL SEXUAL ASSAULT"
4. "AGGRAVATED ASSAULT"
5. "AGGRAVATED BATTERY"
6. "LARCENY - THEFT"
7. "BURGLARY"

8. "ROBBERY"

And almost 6.5 thousand murders. Also, the dataset has over 640 thousand observations on drug crimes including date, detailed description and address of the crime.

Also, we have another dataset on public housing demolition including 276 demolitions with total of over 21 000 units demolished. We use these to identify the threshold to study crime evolution after the demolition.

I classify motor vehicle thefts, theft, burglaries and robberies as economically motivated crimes. There are 1,916,665 of those crimes over the studied period.

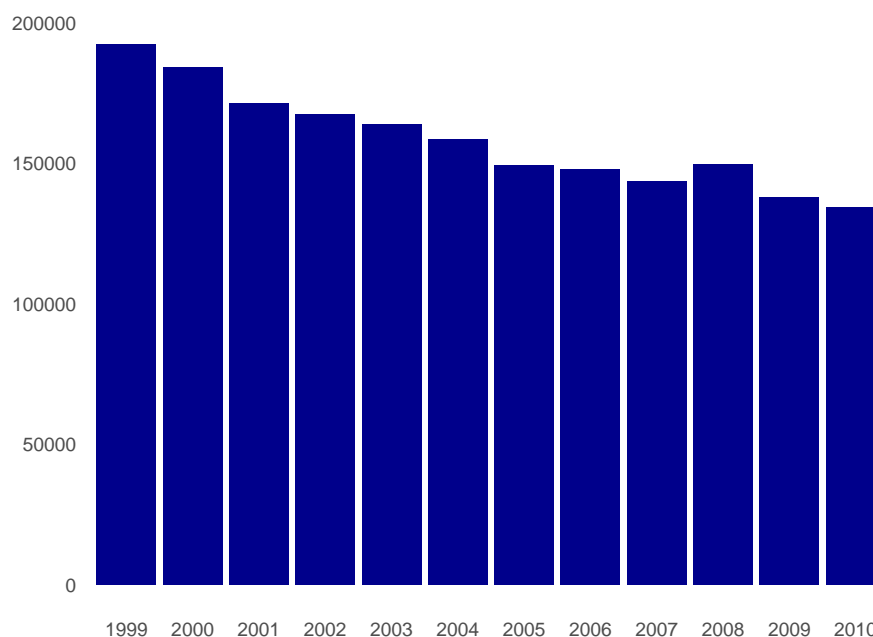


Figure 3: Economically Motivated Crimes in Chicago. Source: [Sandler, 2017]

We see a downward trend in the number of crimes which suggests that estimating a negative effect of public housing demolition on crime can be sensitive to the observable trend.

3.2 Event study

In this simple study I want to see any potential influence of public housing demolition on economically motivated crimes. For this purpose, I select 2001 as a year when the biggest number of public housing was demolished. Over that year, I'm going to plot the demolition dates and economically motivated crimes

in different ZIP code areas. Fully aware of lack of causality in this case, I want to see if any patterns are observed.

Having chosen the year 2001, I see that majority of the housing was demolished in April (2,746 out of 4,305 units). Therefore, I choose April as a cutting point for our analysis.

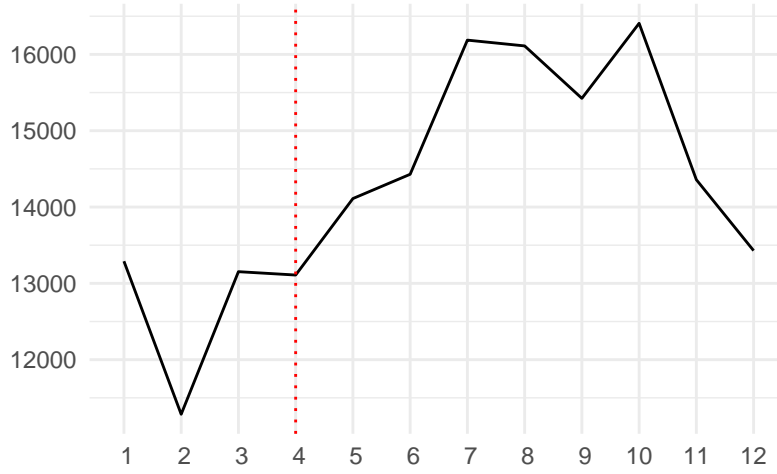


Figure 4: Number of cases of economically motivated crimes in 2001. Dotted line is set for April as the month with the biggest number of public housing demolished.

We can observe a direct increase in number of economic crimes just after the demolition. However, it is followed by a decrease by the end of the year. Given aggregated data, without fixed effects and shocks identification, we are unable to conclude on the effects of the demolition. What is more, the scale of it might be a problem - less than 3,000 units demolished can have very little effect on the crime levels. Even if we are able to identify one, our analysis is vulnerable to small shocks. Another caveat is a very limited time-frame. We might suspect significant general equilibrium effects occurring over time [Bruhn, 2017]. This is also a reflection of previously anticipated scale effect problem - in order to empower the analysis, we would have to run multiple regressions to aggregate the small piling effects of the demolitions.

To further investigate this potential relation I preserve the methodology described in the research design. I spatially join the crimes' points with ZIP code to then count the number of crimes in different areas. Code 60653 that partially covers 3 neighbourhoods is the area where the April demolition took place. There, the evolution of crime takes a much diminished dynamics with flat to decreasing trend after the March peak.

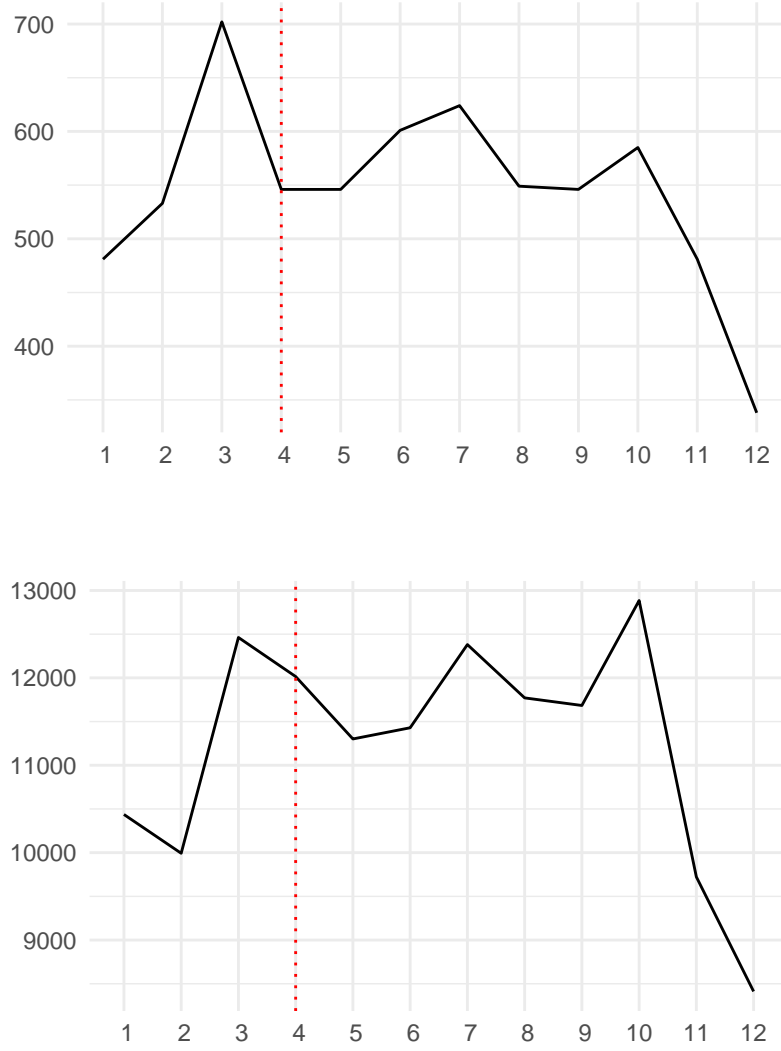


Figure 5: Panel 1 - number of economically motivated crimes in the neighbourhood with demolition. Panel 2 - number of economically motivated crimes outside of the neighbourhood with demolition and outside its neighbouring areas.

The potential control group experience a peak before the demolition with a graduate decline after. We would argue, aligning with the previous research, that demolition of public housing may harm local structures of crime and there-

fore influence number of crimes. Second panel of 5 excluding the examined neighbourhood and its neighbours shows a similar evolution with slightly higher peaks. These do not show a clear relation of the demolition and crime evolution. It seems that most of the peak observed in figure 4 can be accounted to the neighbouring areas of the demolition. This could enforce our doubts related to this event study - short term effects occur in the nearby areas as relocation is a timely process. Now, let us restrict the sample only to low-income areas, as a proxy for low-rent areas. I selected bottom 10 income areas to verify this check.

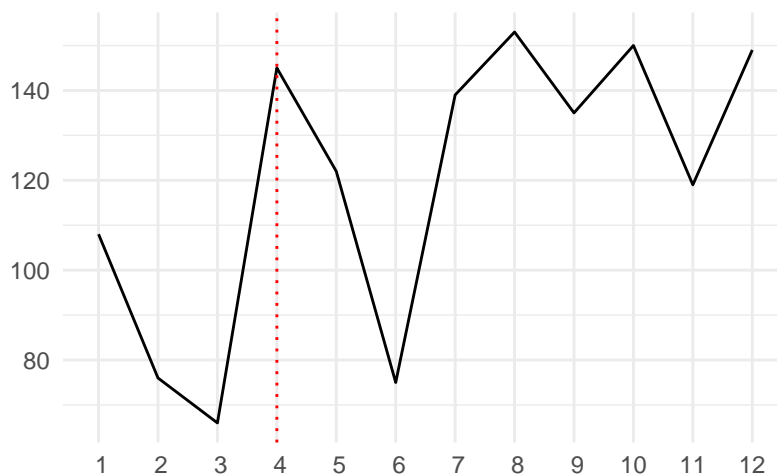


Figure 6: Number of economically motivated crimes in the 5 lowest income areas

A significant peak can be observed exactly in the month of April where the number of crimes almost doubled. Assuming the eviction note was handed before, we could expect our hypothesis to have justification. However, further examination of this data is needed as the scale of the demolition appears to be small. Moreover, the effects of it are perhaps stretched in time, the scale of the crime is very low, and no particular trend is observable. Additionally, our examined areas might have been previously affected by other demolitions whose effects might contaminate our analysis.

4 Conclusion and limitations

4.1 Conclusion

In this research proposal, we have embarked on an exploration of the economic local spillover effects of public housing demolition, focusing on the city of Chicago between 1999 and 2010. The motivation behind this study lies in the broader efforts to address concentrated poverty, crime, and the physical deterioration of public housing developments. The Chicago Housing Authority implemented a comprehensive plan for transformation, aiming to revitalize the city’s public housing stock. However, the consequences of this demolition process have been multifaceted, raising questions about its impact on crime rates and the economic behavior of displaced citizens.

Our preliminary analysis suggests a complex relationship between public housing demolition and economically motivated crimes. The proposed research design involves a nuanced approach, moving beyond simple proximity measures to consider income levels as a proxy for rent in identifying treatment and control groups. By leveraging detailed block-level crime data and public housing demolition information, we aim to shed light on the structural changes in crime patterns resulting from the displacement of individuals.

The event study centered around the year 2001 reveals intriguing dynamics in economically motivated crimes, especially in the aftermath of public housing demolition. However, the short-term fluctuations observed in crime rates necessitate a more rigorous examination, considering potential confounding factors and long-term effects. Our proposed strategy involves overcoming identified challenges, including the no-anticipation assumption and parallel trends assumption, to establish a causal link between public housing demolition and changes in crime structure.

4.2 Limitations

While our research proposal presents a comprehensive framework for understanding the economic spillover effects of public housing demolition, several limitations merit consideration.

Firstly, the lack of a singular moment of demolition poses a methodological challenge in identifying treatment. The continuous nature of housing demolitions requires careful consideration of frequency and thresholds to capture meaningful treatment periods. Additionally, the accumulation effect of demolition events over time needs to be accounted for in order to comprehensively assess their impact. If 10 units are destroyed every month over 10 months, we do not have ability to compare its effect to demolition of 100 units in 1 month. This would require us to take another methodology to identify treatment.

Secondly, the reliance on income as a proxy for rent introduces potential endogeneity concerns. Changes in income levels may be influenced by factors beyond housing policies, challenging the clean identification of treatment and control groups. Furthermore, the short-term nature of the event study may

not capture the full spectrum of effects resulting from public housing demolition. Crime patterns and economic behaviors might exhibit delayed responses, necessitating a more extended time frame for analysis.

Another limitation pertains to the generalization of findings. The unique context of Chicago may limit the external validity of our results. Variations in city characteristics, policies, and demographic compositions could yield different outcomes in other locations.

In conclusion, while our research proposal provides a structured approach to understanding the economic consequences of public housing demolition, addressing these limitations is crucial for producing credible and widely applicable insights. A comprehensive analysis, informed by robust econometric techniques and a careful consideration of confounding factors, will contribute significantly to the scholarly discourse on the interplay between urban policy, housing dynamics, and crime.

4.3 Extension: adding drug networks

Extension: Examining the Connection between Public Housing Demolition, Illegal Drug Networks, and Economic Crimes

Expanding our inquiry into the economic repercussions of public housing demolition, we now turn our attention to the intricate relationship between this urban policy, illicit drug networks, and their potential impact on economic crimes. This extension arises from the recognition that the consequences of public housing demolition extend beyond immediate changes in housing and crime dynamics.

Public housing demolitions, often part of broader urban revitalization initiatives, have the potential to reshape the social and economic landscape of communities. While existing research has primarily focused on direct effects on crime rates, particularly economically motivated crimes, a less-explored avenue involves understanding how these demolitions might influence the dynamics of illegal drug networks. This exploration is essential for a more comprehensive understanding of the general equilibrium effects on economic crimes.

The link between public housing demolition and illegal drug networks can be conceptualized in various ways. On one hand, the displacement of residents may lead to the breakdown of established social networks, creating a more difficult environment to the formation or reconfiguration of illegal drug networks. The dissolution of those networks might disrupt relations and local market, potentially worsening conditions for the illicit drug trade to function.

However, the economic challenges faced by displaced individuals, coupled with the potential disintegration of community support systems, may incentivize some to turn to illicit activities such as drug trafficking as a means of economic survival. This shift in economic activities can have a cascading effect on the prevalence of economically motivated crimes, creating a dynamic interplay between drug-related offenses and other forms of criminal behavior.

To empirically investigate these dynamics, our proposed strategy could be extended to include a specific focus on drug-related crimes in conjunction with

economically motivated crimes. Utilizing the same detailed block-level crime data, we can identify patterns and changes in drug-related offenses before and after public housing demolitions. This extension would require careful consideration of the unique characteristics of drug crimes and their potential spillover effects.

Moreover, the inclusion of drug-related offenses in our analysis could further enhance our understanding of the broader consequences of public housing demolition on the overall safety and economic well-being of affected communities. This extension aligns with the overarching goal of providing policymakers and researchers with a more nuanced and comprehensive perspective on the multifaceted impact of urban transformation initiatives.

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