The Impact of Land Bank Programs on Neighborhood Foreclosure Risks*

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Abstract

Land bank programs are commonly implemented to mitigate the negative effects of vacant and abandoned properties in urban neighborhoods, but their impact on foreclosure risks remains insufficiently examined. This study applies a discrete-time duration model derived from a real options framework to evaluate the influence of land bank acquisitions on foreclosure timing in Columbus, Ohio. The findings reveal that land bank acquisitions significantly reduce foreclosure risks in the short term, especially for properties near land bank properties. Examining heterogeneity, I show that vacant property demolitions result in short term foreclosure risk reduction while property renovations generate longer term reductions in foreclosure risk for nearby homes. The results underscore the vital role of land bank programs, and their implementation, in neighborhood stabilization, while also highlighting the need for sustained and strategic interventions to ensure long-term recovery. Policymakers should consider both spatial and temporal factors when designing and implementing land bank programs in high-risk areas.

Keywords: Land Bank, Housing Abandonment, Housing Values, Foreclosures

JEL Codes: R23; R28; R31

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1 Introduction

Foreclosures are not merely economic phenomena; they represent a serious disruption to communities and households, often triggering a cascade of negative consequences. The loss of a home through foreclosure can result in long-term financial instability for individuals, while for neighborhoods, the impacts are even more severe. Foreclosed properties frequently become vacant, contributing to urban decay, lowering surrounding property values, and increasing crime rates (Cui & Walsh, 2015; Immergluck & Smith, 2006; Ellen, Lacoe, & Sharygin, 2013). These effects can persist for years, exacerbating inequality and creating pockets of blight that deter investment and destabilize communities (Kingsley, Smith, & Price, 2009; Accordino & Johnson, 2000). The aftermath of the 2008 financial crisis illustrated the profound consequences of widespread foreclosures, with millions of homes left vacant, leading to lasting damage in many U.S. neighborhoods (Schuetz, Been, & Ellen, 2008). Foreclosure-induced vacancies were strongly correlated with increased crime rates, reduced property values, and deteriorating social cohesion (Whitaker & Fitzpatrick, 2013; Cui & Walsh, 2015; Blomquist, 2012).

In response to these challenges, land bank programs have emerged as a key policy tool aimed at acquiring vacant and abandoned properties, preventing further deterioration, and promoting neighborhood revitalization (Alexander, 2011; Fujii, 2016). Land banks typically acquire tax-delinquent, foreclosed, or abandoned properties, repurposing them for community benefit (Dewar, Seymour, & Druta, 2015; Schilling & Logan, 2008). By taking control of distressed properties, land banks can prevent them from languishing in speculative markets, where they risk becoming long-term vacancies that drag down surrounding property values (Whitaker & Fitzpatrick, 2013; Alexander, 2011). The goal of land bank programs is to stabilize neighborhoods by reducing vacancies, encouraging redevelopment, and maintaining property values (Alexander, 2011; Schuetz et al., 2011). However, while their general intent is clear, questions remain about their effectiveness in addressing foreclosure risks in the short term. This study seeks to answer a critical question: Do land bank acquisitions reduce the likelihood of future foreclosures in surrounding properties?

The significance of this question extends beyond academic interest. Foreclosures strain local government resources, reducing the tax base, increasing demand for public services, and contributing to social dislocation (Ihlanfeldt & Mayock, 2015). For residents, the spread of foreclosures often means living in neighborhoods marked by deteriorating infrastructure, heightened crime, and diminished economic opportunity (Immergluck & Smith, 2006; Anenberg & Kung, 2014). Moreover, the problem is not evenly distributed; lower-income and minority communities tend to suffer disproportionately from the negative effects of foreclosures, worsening existing inequalities (Hall, Crowder, & Spring, 2015; Mian, Sufi, & Trebbi, 2015). Understanding whether land banks can play a stabilizing role has important implications not only for economists and policymakers but also for the broader public interested in creating resilient, equitable communities (Immergluck, 2011).

While there is a rich literature on the spillover effects of foreclosures on property values and community stability (Immergluck & Smith, 2006; Harding et al., 2009; Campbell et al., 2011), relatively few studies have directly examined how land bank programs influence foreclosure dynamics. Much of the existing research has focused on the broader impacts of foreclosures on communities, highlighting how foreclosures depress nearby property values (Guren & McQuade, 2020) or contribute to foreclosure contagion, where defaults in one property trigger a wave of foreclosures nearby (Guiso et al., 2013). My study contributes to this literature by examining the role of land bank acquisitions in preventing further neighborhood decline and reducing foreclosure risks in the short term.

This study makes three specific contributions to the literature. First, I use a unique dataset from Columbus, Ohio, that includes parcel-level information on land bank acquisitions and foreclosure filings between 2011 and 2018. This detailed, localized data allows for a more granular analysis of how land bank interventions affect foreclosure likelihood in the immediate vicinity of acquired properties. Second, I employ a discrete-time duration model to analyze the dynamic process by which households decide to enter foreclosure, allowing me to assess the timing of foreclosures relative to land bank interventions. This methodology controls for time-varying factors and reduces endogeneity concerns, providing a clearer picture of the short-term effects of land bank programs. Third, while much of the literature has focused on long-term effects, my research emphasizes the short-run impacts, finding that land bank acquisitions significantly reduce foreclosure risk within four years of acquisition—a crucial period for neighborhood stabilization.

The results of my analysis show that land bank acquisitions have a statistically significant impact on reducing foreclosure likelihood in nearby properties, particularly within 250-meter and 500-meter buffers around the acquired parcels. This effect is strongest in the short term, with a noticeable decline in foreclosure risk during the first year following acquisition. The analysis also reveals that the effect of land bank acquisitions on foreclosure risk diminishes over time, with the greatest impact seen within the first two years. The positive effect of land bank interventions fades by the third year, and foreclosure risks slightly increase in the fourth year. This suggests that while land bank programs can provide immediate neighborhood stabilization, their longer-term efficacy may require additional support or complementary policies.

In contrast to other studies that have focused on the broader consequences of foreclosures, my research sheds light on how targeted, localized interventions can prevent further neighborhood decline. By demonstrating that land bank programs can significantly reduce foreclosure likelihood in the short term, this study offers important insights for policymakers, urban planners, and community advocates seeking to mitigate the fallout from foreclosures. The findings suggest that land banks can play a crucial role in stabilizing distressed neighborhoods, but their impact may be limited without sustained efforts to address the root causes of foreclosure and urban blight.

2 Background

The foreclosure crisis following the 2008 financial collapse had a profound impact on urban areas across the United States, with Columbus, Ohio, being no exception. The city experienced a sharp rise in foreclosure rates, particularly in lower-income neighborhoods and areas closer to the city center. These foreclosures led to an increase in vacant and abandoned properties, creating a cycle of urban decline and disinvestment. The resulting externalities included reduced property values, increased crime, and a significant strain on local government resources (Immergluck & Smith, 2006; Harding, Rosenblatt, & Yao, 2009). These conditions underscored the need for targeted interventions to stabilize neighborhoods and prevent further decline, with land bank programs emerging as a key policy tool to address these challenges.

The negative spillover effects of foreclosures on surrounding properties and neighborhoods are well-documented. Research indicates that each additional foreclosure in a neighborhood can decrease nearby property values by as much as 1% to 2% within a short radius (Harding, Rosenblatt, & Yao, 2009). This decline in property values leads to further disinvestment, as deteriorating homes reduce the desirability of the neighborhood and erode confidence in the local housing market (Cui & Walsh, 2015). Additionally, foreclosed and vacant homes become prime targets for vandalism, squatting, and other criminal activities, further exacerbating the decline (Whitaker & Fitzpatrick, 2013). These destabilizing effects are particularly severe in lower-income areas, where housing markets are already fragile, and residents have fewer resources to mitigate the financial impacts of declining property values (Immergluck & Smith, 2006).

Moreover, foreclosures often trigger a phenomenon known as foreclosure contagion, in which one foreclosure increases the likelihood of additional foreclosures within the same neighborhood. Guiso, Sapienza, and Zingales (2013) suggest that foreclosure contagion is driven by the decline in home equity that follows a foreclosure, causing other homeowners in the area to fall into negative equity and default on their mortgages. This feedback loop accelerates neighborhood decline and intensifies the need for timely interventions. As the literature shows, the clustering of foreclosures not only depresses local housing markets but also imposes significant costs on local governments, which must manage these vacant properties while grappling with reduced tax revenues (Ihlanfeldt & Mayock, 2015).

In response to these challenges, land bank programs have been implemented in cities across the country, with the Columbus land bank program being one of the most proactive in addressing the externalities of foreclosures. Since 2012, the Central Ohio Community Improvement Corporation (COCIC) and the City of Columbus Land Redevelopment Division have worked in tandem to acquire, repurpose, and rehabilitate vacant and tax-delinquent properties. These land banks aim to mitigate the negative spillovers of foreclosures by removing or redeveloping blighted properties, thereby protecting home values and promoting economic revitalization.

The efforts of the Columbus land banks align with existing foreclosure literature that emphasizes the importance of early intervention. By acquiring foreclosed properties through methods such as tax lien foreclosure, expedited foreclosure, and state forfeiture, the land banks have reduced the time properties remain vacant, preventing further deterioration. Studies have demonstrated that early interventions can help restore confidence in local housing markets and slow the spread of foreclosure contagion (Anenberg & Kung, 2014).

A core strategy of the Columbus land bank program has been the demolition of severely blighted structures that pose a threat to surrounding property values. Between 2012 and 2017, the land banks demolished more than 1,600 blighted structures, protecting an estimated $90 million in home values by eliminating properties that would have otherwise depressed the neighborhood. Demolition has proven to be particularly effective in areas where properties are beyond repair and attract crime, as documented by Whitaker and Fitzpatrick (2013). However, demolition is only one aspect of the land banks' broader approach, which also includes rehabilitating salvageable properties and repurposing vacant lots for community use, such as community gardens or side lots for neighboring homeowners. These efforts not only improve the physical appearance of neighborhoods but also contribute to long-term stability by reducing the likelihood of future foreclosures.

In addition to demolition, the Columbus land banks have employed innovative property acquisition methods to expedite the process of acquiring distressed properties. By purchasing tax lien certificates from the Franklin County Treasurer's Office and directly initiating foreclosure actions, COCIC has significantly reduced acquisition times. This allows the land banks to intervene before properties further deteriorate, preventing deeper cycles of decline (Cui & Walsh, 2015). Moreover, the land banks' ability to clear liens and other encumbrances on these properties through legal mechanisms enables them to prepare properties for redevelopment or resale quickly, ensuring that they do not remain vacant for extended periods.

Using the Columbus land bank program interventions combined with parcel-level data from Columbus and Franklin County, this analysis investigates whether land bank interventions—particularly property acquisitions—reduce foreclosure risks and examines the spatial and temporal extent of these reductions. To identify the impact of land bank program interventions on the timing of foreclosure, this study employs a duration model, which is a reduced form representation of a real options problem on the optimal timing of foreclosure (Capozza and Li, 1994; Klaiber & Wang, 2012; Wrenn & Irwin, 2015). This is well-suited for analyzing the timing of events such as foreclosures and has been used previously to examine foreclosure spillovers in the literature (Towe & Lawley, 2013).

The use of a duration model is particularly important given the unbalanced nature of the dataset, where properties are observed over varying time periods. Unbalanced panels, typical in real estate data, arise from differences in acquisition dates, foreclosure proceedings, and property sales. The duration model effectively handles this aspect of the data, allowing for a robust analysis of properties that enter or exit the sample at different times. This approach offers a nuanced understanding of how the timing and management of land bank acquisitions influence foreclosure risks in nearby areas.

3 Data

This study integrates a comprehensive dataset from the Franklin County Auditor's Office, the Columbus Land Redevelopment Office, and other sources to explore foreclosure dynamics, land bank acquisitions, and neighborhood-level controls in Franklin County. The data includes tracking of individual residential parcels over time, focusing on properties most affected by the foreclosure crisis, such as single-family homes, multi-family homes, and condominiums. The dataset, structured as an unbalanced panel, covers the years 2011 to 2018 and includes both foreclosed and non-foreclosed properties. Additionally, detailed records from the Columbus Land Redevelopment Office provide insights into land bank interventions through the acquisition and classification of 1,712 parcels. Neighborhood control variables from census and mortgage data are also incorporated to provide a comprehensive understanding of socio-economic and housing market conditions across the county.

3.1 Foreclosures

The primary data source for this analysis is the Franklin County Auditor's Office, which provided comprehensive records on property characteristics, including sales prices, transaction dates, ownership details, and property locations. This rich dataset enabled the tracking of individual parcels over time, covering both foreclosed and non-foreclosed properties, and allowed for a detailed examination of the factors contributing to foreclosure risk. The dataset was refined to focus exclusively on residential land use types—such as single-family homes, multi-family homes, and condominiums—since these categories were most affected by the foreclosure crisis. Properties with missing data were excluded to ensure the accuracy and integrity of the analysis.

Foreclosure identification was based on transaction data, with particular focus on ownership transfers to financial institutions, which typically signal foreclosure proceedings. Properties were classified as foreclosed when the new owner’s name included terms like "bank," "loan," "home," "financing," "mortgage," or "financial," indicating repossession by a financial institution. This method captures properties that underwent foreclosure and were transferred to institutional ownership.

The dataset spans the years 2011 to 2018. It includes two types of parcels: (1) parcels that had at least one transaction between 2011 and 2018 and did not experience foreclosure, and (2) parcels that were foreclosed upon and subsequently exited the dataset after the foreclosure event. Considering the time at risk of foreclosure, I follow the land use duration literature and assume that each parcel can only experience a single foreclosure. Practically, this results in the removal of parcels following foreclosure as those parcels are no longer at risk of foreclosure and exit the dataset. For parcels not experiencing foreclosure, they are “right-censored” in that we do not observe a foreclosure event and they remain, or survive, in the dataset in all time periods

The final dataset consists of 301,910 parcel-year observations. Across time, 5,916 parcels experience foreclosure at some point during the 8-year period. Figures 1 and 2 offer visual representations of the spatial distribution of these parcels within Franklin County. Figure 1 shows all residential parcels in the dataset (black areas), highlighting the distribution of housing across the county. The map reveals a clear urban-suburban pattern, with denser residential areas near the urban core and more dispersed parcels in suburban and rural areas. Figure 2 further categorizes the parcels, distinguishing between foreclosed parcels (highlighted in black) and parcels sold on the private market without foreclosure (highlighted in grey). Parcels with missing transaction data or foreclosure information are shown in white. This visualization illustrates the spatial clustering of foreclosed and non-foreclosed properties, providing insights into the geographic concentration of foreclosure risk. By examining the proximity between foreclosed, private market sales, and non-transacting parcels, the map offers a clearer understanding of how foreclosure risk is spatially concentrated, particularly in relation to neighboring properties.

3.2 Land Bank

Data from the Columbus Land Redevelopment Office provides detailed records on abandoned and tax-delinquent parcels, identifying 1,712 parcels acquired by the land bank program. These parcels are concentrated primarily in neighborhoods near the city center, particularly in areas severely impacted by the foreclosure crisis. The land bank-acquired parcels are classified into two main categories based on property status: "residential vacant" and "residential improved." Residential vacant parcels refer to properties where buildings were demolished after acquisition, an effort undertaken to reduce negative externalities from abandoned buildings and reduce supply of homes in distressed neighborhoods. Residential improved properties are those where remediation of properties takes place with the goal to return these homes to the private real estate market.

The vacant category can be further divided into two subcategories: "always vacant" and "community garden." "Always vacant" refers to parcels that remain undeveloped post-demolition, with no immediate plans for redevelopment. These lots may eventually be purchased and redeveloped by private owners or investment companies, but this process is typically significantly delayed beyond the initial demolition. The "community garden" subcategory consists of parcels converted into gardens after demolition, which are owned and maintained by the City of Columbus.

Figure 3 illustrates the annual distribution of land bank acquisitions, showing that over 90% of the acquired parcels fall into the "residential vacant" category, with the majority classified as "always vacant." The number of land bank acquisitions increased significantly after 2014, peaking in 2017, reflecting the city's intensified efforts to address the foreclosure crisis and reduce urban blight during this period.

Figure 4 illustrates the spatial distribution of land bank acquisitions across a targeted area in Franklin County. The purple dot represents downtown Columbus, where there is a notable clustering of land bank acquisitions, particularly in areas close to the urban core. The spatial concentration of acquisitions in the central neighborhoods indicates a strategic focus on addressing areas most impacted by urban blight and the foreclosure crisis.

Figure 5 provides a more detailed categorization of these land bank acquisitions, distinguishing between "residential vacant - vacant" (solid red), "residential vacant - garden" (red with stripes), and "residential improved" (blue) parcels. The map highlights the land bank's concentrated efforts in urban neighborhoods severely affected by foreclosure. The spatial patterns show a deliberate strategy for stabilizing these communities through multiple interventions: demolishing or maintaining vacant properties, converting parcels into community gardens, and improving existing residential properties.

Together, these figures provide crucial context for understanding the land bank program's broader impact on revitalizing neighborhoods affected by foreclosure. By focusing on both vacant and improved parcels, the data reveal how targeted acquisitions were concentrated in the most distressed areas. The combination of property status and geographic concentration illustrates the program's dual approach: addressing immediate needs, such as vacant property management and community garden creation, alongside long-term improvements to residential properties. These efforts underscore the land bank's significant role in fostering the revitalization of Franklin County's hardest-hit neighborhoods.

Figure 6 offers a neighborhood-level perspective of how land bank acquisitions interact with foreclosed and surviving parcels. Surviving parcels (grey) represent properties that remained in the dataset without foreclosure, while foreclosed parcels (black) exited the dataset after foreclosure. The map shows a clustering of land bank acquisitions (red) around areas of high foreclosure risk, highlighting the program's targeted approach to stabilizing at-risk neighborhoods. This detailed view helps illustrate the nuanced dynamics of land bank intervention, where both foreclosed and surviving parcels are found within close proximity to land bank properties, indicating efforts to mitigate urban decay in the most vulnerable areas.

To better understand the spatial and temporal distribution of land bank parcels, Table 2 provides summary statistics on the number of land bank parcels categorized as "vacant," "garden," and "improved" within three buffer zones: 250 meters, 500 meters, and 750 meters. The table captures the mean, standard deviation (SD), minimum, and maximum number of parcels in these categories for acquisitions that occurred either within the past year or 2 years and more prior to the observation period. This distinction helps capture the short-term and longer-term effects of land bank interventions, as the time periods are distinct and non-overlapping.

The summary statistics show that within the 250-meter buffer, the mean number of vacant parcels acquired in the past year is 0.13, while it rises to 0.32 for parcels acquired 2 years and more ago. This pattern is consistent across all buffer sizes, with the 500-meter and 750-meter buffers showing a similar trend. In the 750-meter buffer, the mean number of vacant parcels jumps from 0.97 for acquisitions within the past year to 2.43 for older acquisitions. This suggests that vacant parcels are widely distributed over time, reflecting the gradual nature of redevelopment efforts following land bank interventions.

In contrast, garden parcels, which typically represent properties converted into community gardens after acquisition, show a much lower concentration across all buffer sizes and time periods. For instance, the mean number of garden parcels within the 250-meter buffer is 0.01 for both the past year and older acquisitions, highlighting that these parcels are less common, and their impact is more localized. This trend is also seen within the 500-meter and 750-meter buffers, where garden parcels remain sparse, with means of 0.04 and 0.07, respectively, for acquisitions made 2 years and more ago.

For improved parcels, which represent properties where structures have been retained and enhanced rather than demolished, a gradual increase over time is apparent but these parcels remain relatively small in number. For example, within the 250-meter buffer, the mean number of improved parcels is 0.01 for acquisitions in the past year and rises slightly to 0.02 for those acquired more than 2 years ago. This suggests that while the land bank program has led to some property improvements, the overall number of such parcels remains modest compared to demolition and creation of vacant lots.

Table 3 presents summary statistics for key control variables representing the number of nearby foreclosures within the previous year. This control variable accounts for the external influence of ongoing foreclosure activity on the impact of land bank acquisitions. The control variable was calculated for the same distance thresholds (250 meters, 500 meters, and 750 meters) used in the main analysis. For example, within a 500-meter buffer, the mean number of foreclosures was 2.81, with a maximum of 50 foreclosures in highly impacted areas.

Figure 7 provides a visual example using a parcel from 2012 to show how land bank acquisitions and nearby foreclosures are modeled in the analysis. In this figure, a 500-meter buffer is used around a selected parcel (highlighted in black) to capture surrounding foreclosures and land bank acquisitions. Black parcels represent foreclosures that occurred in the previous year (2011), contributing to the local foreclosure density. The parcels marked in purple represent land bank acquisitions from the previous year (2011), while blue parcels indicate land bank acquisitions from two years prior (2010). Similarly, green and yellow parcels correspond to land bank acquisitions from three years ago (2009) and four years ago (2008), respectively.

3.3 Neighborhood Controls

To better understand the relationship between housing characteristics and property values, and to effectively isolate the effects of foreclosure from broader community-level price dynamics, we construct a housing price index using a fixed-effects regression model. The fixed-effects approach is widely supported in the literature as a method for creating localized price indices (Epple and Sieg, 1999; Klaiber and Phaneuf, 2010). Following this framework, our housing price index captures localized price variation while holding constant broader neighborhood-level characteristics that do not change over time, which is described in Appendix A.

In addition to constructing the housing price index, we use the Home Mortgage Disclosure Act (HMDA) to include loan attributes, such as the socioeconomic characteristics of loan applicants. Loan characteristics, including the ratio of conventional and refinance loans to average sales values by tract, applicant income for both conventional and refinance loan applications, and the total loan amounts, are integral to understanding the financial landscape that impacts foreclosure risks. Neighborhood and community characteristics were incorporated from the National Historical Geographic Information System (NHGIS), which provides detailed census and survey data. The final dataset includes a comprehensive range of covariates: proximity to land bank properties, housing price index, loan characteristics, and neighborhood socioeconomic factors. The summary statistics, as shown in Table 4, give an overview of these variables, illustrating their distribution and variability, which are essential for analyzing foreclosure risks and the impact of land bank acquisitions on nearby neighborhoods.

4 Duration Model of the Timing of Foreclosure

To evaluate the impact of land bank acquisitions on the likelihood of future foreclosures in surrounding neighborhoods, we employ a duration model framework, with a specific emphasis on the discrete-time duration method. Duration models are particularly well-suited for analyzing the timing of events such as foreclosures because they account for the dynamic and sequential nature of these processes. The occurrence of a foreclosure event in any given period inherently implies that the event did not occur in any prior period, which is central to the concept of optimal stopping decisions (Irwin and Bockstael, 2002; Cunningham, 2007; Towe et al., 2008; Bulan et al., 2009; Wrenn and Irwin, 2015).

In general, duration models are designed to analyze the time until an event occurs. The key variable of interest in our study is the time t until a property experiences foreclosure. The model aims to understand how a set of covariates, X_{mt}, for a given parcel *m* at time t, influences the probability of foreclosure. The observations in a duration model represent "spells"—periods during which the same parcel is observed until the foreclosure event occurs or is censored (i.e., does not occur within the observation period).

The likelihood of foreclosure over time is described by a probability density function $f(t)$, which expresses the instantaneous probability of the event occurring at time t:

$$f(t) = Prob(t \leq T < t + dt) \ , \qquad (1)$$

where T is the random variable representing the time to foreclosure. The corresponding cumulative distribution function (CDF) $F(t)$ gives the cumulative probability that the foreclosure has occurred by time t:

$$F(t) = \int_0^t f(s)ds = Pr\ (T \leq t),\ t \geq 0, \tag{2}$$

The survival function $S(t)$, which represents the probability that a property has not been foreclosed by time t, is derived by subtracting the CDF from one. The hazard function, $\lambda\ (t)$, is defined as the ratio of the density function to the survival function:

$$\lambda\ (t) = \frac{f(t)}{S(t)} = \ Prob\ (t \leq T \leq T + dt\ |T \geq t), \tag{3}$$

This hazard function captures the instantaneous risk of foreclosure at time t, given that the property has survived (i.e., not been foreclosed) up to that point.

Given that our data are organized in annual intervals, we specifically apply the discrete-time duration model, which is particularly effective when data contain many ties—situations where multiple events occur at the same time point. The discrete-time duration model allows us to adapt the continuous-time concepts to a framework that is more appropriate for data with fixed time intervals.

The discrete-time duration model is implemented through a binary probit specification with time fixed effects (Beck et al., 1998)). This approach serves as an approximation to the continuous-time hazard model but is tailored to handle the discrete nature of our data. The probability that a property will experience foreclosure at time t, given the covariates, is modeled as follows:

$$Prob(y_{mt} = 1|X) = \lambda(t|\ X) = \frac{e^{-\left(X'\beta + \tau_{t-t_0}\right)}}{1+e^{-\left(X'\beta + \tau_{t-t_0}\right)}}, \tag{4}$$

Here, $y_{mt} = 1$ indicates that a foreclosure event occurs for parcel m at time t. The vector X includes covariates such as housing characteristics (e.g., housing price index, age of the home), neighborhood characteristics (e.g., median income, population density), and variables related to the proximity and density of land bank properties. The time fixed effects τ_{t-t_0} are incorporated to model the baseline hazard and account for the censored nature of the data, ensuring that we accurately capture the timing of foreclosures.

5 Results

The results in Table 5 assess the likelihood of future foreclosures using a discrete-time duration model, focusing on properties within 250 meters, 500 meters, and 750 meters of land bank acquisitions. The dependent variable is a binary indicator representing whether a foreclosure occurs in the subsequent year, while key independent variables include nearby foreclosures, land bank acquisitions, housing characteristics, neighborhood and community attributes, and loan characteristics.

The primary variable of interest in this analysis is the land bank treatment, which captures whether any land bank intervention occurred within the specified buffer zones in the years leading up to the observation (1 year, 2 years, or more). This treatment variable reflects the cumulative impact of land bank acquisitions over multiple years, rather than focusing solely on the immediate effects of a single year's intervention. By accounting for multiple years of land bank activity, the model provides a comprehensive understanding of how these interventions influence foreclosure risks over time.

Before examining the land bank results, we first address foreclosure spillovers as those have been shown to be a key driver of future foreclosures in the existing literature. Our findings match the existing literature, revealing a notable foreclosure contagion effect, whereby nearby foreclosures significantly increase the probability of future foreclosures. For example, within the

250-meter buffer, the presence of a nearby foreclosure increases the likelihood of foreclosure by 1.4%. This effect persists, though slightly diminished, across the 500-meter and 750-meter buffers. These results suggest that the spatial clustering of foreclosures is a major factor in the spread of foreclosure risks, where one distressed property can lead to destabilization in surrounding areas.

Turning next to the land bank treatment, the results indicate a significant reduction in foreclosure risks in areas where land bank interventions have occurred. Within the 250-meter buffer, the presence of any land bank acquisition over the past several years reduces the foreclosure probability by 5.4%. Similarly, within the 500-meter and 750-meter buffers, foreclosure risks decrease by 5.27% and 4.81%, respectively. These findings demonstrate that the cumulative effect of land bank interventions—whether they occurred recently or several years prior—plays a crucial role in stabilizing neighborhoods and reducing foreclosure rates.

The analysis also incorporates control variables related to housing, neighborhood, and loan characteristics that influence foreclosure risks. For instance, higher property values and newer homes are associated with lower foreclosure probabilities, while higher percentages of Black residents and lower median incomes within a neighborhood are linked to increased foreclosure risks. Additionally, the ratio of conventional loans to average sales values emerges as a significant predictor, underscoring the role of lending practices in influencing foreclosure dynamics.

Overall, these findings underscore the pivotal role that land bank programs play in stabilizing distressed neighborhoods by mitigating foreclosure risks. The cumulative presence of land bank acquisitions—whether recent or older—helps buffer against the spread of foreclosure contagion, contributing to more resilient and stable communities. This highlights the importance of ongoing land bank interventions as a tool for urban redevelopment and neighborhood revitalization.

5.1 Heterogeneity in Land Bank Remediation

Table 6 expands the initial analysis by differentiating between vacant and improved land bank acquisitions, offering insights into the distinct impacts of these property types on foreclosure risks. The results for nearby foreclosures continue to demonstrate a significant contagion effect, where the presence of nearby foreclosures is positively associated with an increased likelihood of future foreclosures across all distance buffers. For example, within a 250-meter radius, the presence of a nearby foreclosure increases the probability of foreclosure by approximately 1.39%. This contagion effect remains significant, though slightly smaller in magnitude, at 500 meters and 750 meters.

The land bank acquisitions, now categorized as "Residential Vacant" and "Residential Improved," show different patterns of influence on foreclosure risks. For vacant properties, labeled as "Residential Vacant," the results reveal a strong, immediate reduction in foreclosure likelihood. At 250 meters, foreclosure risk decreases by 3.98%, with smaller reductions observed at 500 meters (3.52%) and 750 meters (3.45%). This suggests that the demolition of structures on acquired properties, which often contribute to urban blight, provides an immediate stabilization effect on neighborhoods, although this effect diminishes slightly as the distance increases.

In the case of "Residential Improved" parcels, the impact on foreclosure risk is even more substantial. At 250 meters, improved property acquisitions reduce foreclosure likelihood by 8.38%, with the effect tapering off at 500 meters (5.82%) and 750 meters (4.60%). This highlights the stronger, longer-lasting benefits of land bank programs that involve the rehabilitation or improvement of properties, as these interventions have a more pronounced effect on stabilizing neighborhoods over a broader area. Both types of land bank interventions exhibit a diminishing effect as the buffer size increases, reflecting the localized nature of their impacts.

In Table 7, the analysis further refines the types of land bank acquisitions by distinguishing between "vacant" properties and those repurposed as "community gardens." The results show that traditional vacant property acquisitions significantly reduce foreclosure risks, with significant effects at the 250-meter, 500-meter, and 750-meter buffers. However, the results for community garden acquisitions are less convincing. Within the 250-meter buffer, the coefficients for garden properties are statistically insignificant, indicating that, in close proximity, these properties do not have a discernible impact on foreclosure risks. Interestingly, when expanding to the 500-meter and 750-meter buffers, community garden properties are associated with an increase in foreclosure likelihood. This suggests that while community gardens are intended to repurpose vacant lots and contribute to community revitalization, they may not offer the same level of neighborhood stabilization as vacant or improved properties. The observed increase in foreclosure risk at greater distances could be due to limited economic returns or insufficient community engagement associated with garden properties.

5.2 Continuous Land Bank Treatment

To further explore the impact of land bank acquisitions on foreclosure risks, the analysis transitions from using binary treatment variables (0/1) to count variables representing the number of land bank acquisitions within specified buffer zones. While the dummy variables in previous models provide insights into whether land bank interventions occurred, the count variables allow for a more granular understanding of the magnitude of these interventions. By examining the number of residential vacant and residential improved parcels acquired within 250-meter, 500-meter, and 750-meter distances, we can assess whether a higher concentration of land bank acquisitions has a compounding effect on reducing foreclosure risks. This transition to count-based variables enables a more detailed examination of the relationship between land bank activity intensity and neighborhood stabilization outcomes.

The results in Table 8 assess the impact of land bank acquisitions, specifically residential vacant and improved properties, on foreclosure risks using count variables. The findings reveal that for vacant property acquisitions, the coefficients are negative but not statistically significant across all buffer distances (250 m, 500 m, and 750 m). This suggests that increasing the number of vacant parcels acquired by the land bank does not significantly reduce foreclosure risks. While these acquisitions may help stabilize neighborhoods, they do not appear to have a compounding effect in preventing foreclosures.

In contrast, land bank acquisitions where the properties are ultimate renovated and improved show a significant reduction in foreclosure risks across all buffer distances. At the 250-meter buffer, each additional improved property is associated with an 8.45% reduction in foreclosure likelihood, with effects decreasing slightly at 500 meters (3.68%) and 750 meters (1.81%). This highlights the effectiveness of property improvements in stabilizing neighborhoods and reducing foreclosure risks.

In summary, while vacant property acquisitions alone may not substantially lower foreclosure risks, land bank interventions involving property improvements have a measurable and significant impact on neighborhood stabilization. These findings underscore the importance of focusing on property improvements to mitigate foreclosure risks and support long-term community recovery.

5.3 Temporal Heterogeneity and Cumulative Impacts

To better understand the timing of land bank interventions, Table 9 categorizes acquisitions into two periods: those occurring within the past year ("1 year") and those occurring two years or more prior ("2 years and more"). This temporal breakdown allows for the assessment of both immediate and long-term effects of land bank activities on foreclosure risks. The findings reveal important distinctions between recent and older acquisitions, providing insights into the effectiveness of different intervention strategies.

For residential vacant properties, the number of acquisitions within the past year is consistently associated with a reduction in foreclosure risk across all buffer distances. For example, within 250 meters, recent vacant acquisitions reduce the likelihood of foreclosure by 2.1%. This stabilizing effect diminishes somewhat at 500 meters and 750 meters but remains statistically significant, indicating that recent vacant property interventions provide immediate, though localized, neighborhood stabilization.

However, for vacant properties acquired two years or more ago, the effects are more mixed. At 500 and 750 meters, these older acquisitions are associated with a positive and significant increase in foreclosure risk. This could imply that the benefits of vacant property acquisitions wane over time, or that long-term neighborhood stabilization requires ongoing interventions beyond the initial acquisition.

In contrast, residential improved properties show more robust and consistent effects. For properties improved two years or more ago, there is a significant reduction in foreclosure risk across all buffer distances. The strongest effect is observed within 250 meters, where the likelihood of foreclosure decreases by 9.69%. This effect remains significant, though slightly smaller, at 500 meters and 750 meters. The results indicate that the improvement of residential properties offers lasting neighborhood benefits, significantly contributing to long-term stability.

Overall, these findings suggest that the timing of land bank acquisitions matters: recent vacant property acquisitions have an immediate stabilizing effect, while older vacant properties may require additional support to sustain long-term benefits. On the other hand, improved properties provide more durable neighborhood stabilization, with long-term benefits that persist over time. These insights are critical for policymakers seeking to optimize the timing and type of land bank interventions to maximize their impact on foreclosure risk and community recovery.

6 Discussion

The findings from this study provide critical new insights into the role of land bank programs in mitigating foreclosure risks, particularly in distressed neighborhoods. Land bank programs, implemented across U.S. cities, aim to address the adverse effects of vacant and abandoned properties, which contribute to neighborhood decline, falling property values, and rising foreclosure rates. This research, focusing on Columbus, Ohio’s land bank program, uses a discrete-time duration model to assess how land bank acquisitions influence the likelihood of future foreclosures. The analysis distinguishes between immediate (within one year) and longer-term (two years and more) impacts and includes the types of properties acquired—vacant, garden, and improved.

The results demonstrate that land bank acquisitions have a significant short-term impact on reducing foreclosure risks for nearby properties, particularly within the first year following acquisition. For example, properties within a 500-meter buffer are approximately 1.41% to 1.11% less likely to face foreclosure within one year after a land bank acquisition. This immediate reduction highlights the stabilizing effect of land bank programs, which often focus on removing distressed properties and signaling the start of revitalization efforts in struggling neighborhoods.

However, the long-term impact of land bank acquisitions is more nuanced. The results indicate that while the immediate (one-year) benefits of vacant property acquisitions are significant in reducing foreclosure risks, the effect of longer-term (two years and more) acquisitions is less consistent. For vacant properties, the impact becomes statistically insignificant over time in some cases, while garden properties acquired two or more years ago are associated with a small but positive effect on foreclosure reduction. These findings suggest that the timing and type of property matter: the immediate removal of vacant lots is effective, but sustaining the benefits of these interventions requires continued investment and neighborhood improvements.

Interestingly, the study shows that improved properties, regardless of whether they were acquired in the last year or in prior years, have the most robust and consistent foreclosure risk reduction. For example, at 250 meters, improved property acquisitions decrease foreclosure risk by 8.43% in the first year and 9.67% for acquisitions from two years and beyond. This underscores the importance of targeting property improvements, such as repairs or renovations, as these have the most durable and significant impact on neighborhood stability and foreclosure risk reduction.

In contrast, community gardens present a more complex picture. While they may offer social and environmental benefits, their impact on foreclosure risks is less clear. The results show that garden acquisitions in the last year do not significantly affect foreclosure risks, while those acquired two or more years ago show a modest reduction in some buffer zones. However, the effects are smaller compared to those of vacant and improved properties, suggesting that while community gardens may contribute to broader neighborhood well-being, they do not directly address the structural economic factors influencing foreclosure risks.

The spatial dimension of land bank effectiveness is also crucial. Properties located closer to land bank acquisition sites, particularly within 250 to 500 meters, experience the most significant stabilization benefits. As the distance increases to 750 meters, the protective effects of land bank interventions weaken, underscoring the importance of proximity in the success of these programs.

The transition from using simple binary (dummy) treatment variables to counts of land bank acquisitions further refines our understanding of land bank interventions. The analysis reveals that the number of land bank acquisitions, especially improved properties, plays a critical role in reducing foreclosure risks. However, the benefits of acquiring multiple vacant or garden parcels are less pronounced unless accompanied by property improvements or timely redevelopment efforts.

For policymakers and urban planners, the implications are clear: while land bank programs offer significant short-term foreclosure risk reductions, their long-term success depends on sustained property improvements and strategic repurposing of vacant lots. Targeting high-risk areas and focusing on interventions that improve property conditions—such as repairs and renovations—can achieve the most substantial and lasting neighborhood stabilization effects. Furthermore, the results highlight the importance of proximity to the intervention site, suggesting that land bank efforts should be concentrated in areas where they can provide the greatest stabilization benefits.

In conclusion, this study demonstrates that land bank programs can be an effective tool for reducing foreclosure risks and stabilizing distressed neighborhoods. However, their long-term success relies on ongoing property improvements and strategic redevelopment, particularly for vacant properties. By prioritizing improved properties and focusing on high-risk areas, policymakers can enhance the effectiveness of land bank programs and support the long-term recovery and resilience of neighborhoods facing foreclosure challenges.

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Table 1. The Whole Transactions and Foreclosures Observations

Transaction Year	Market	Foreclosures	Observations
2011	30,800	1,449	32,249
2012	44,770	1,330	46,100
2013	50,624	1,224	51,848
2014	47,487	629	48,116
2015	30,828	373	31,201
2016	36,231	451	36,682
2017	35,420	318	35,738
2018	19,834	142	19,976
Total	295,994	5,916	301,910

The table provides a summary of the real estate market data from 2011 to 2018, showing the total number of market transactions, foreclosures, and observations each year. The "Market" column indicates the total number of properties involved in market transactions, while the "Foreclosures" column shows the number of properties that underwent foreclosure during that year. The "Observations" column reflects the total number of transactions recorded for that year.

Table 2. Summary Statistics of Land Bank Acquisitions by Category and Buffer Distance

Categories	Time	Mean	SD	Min	Max
Vacant 250m	1 year	0.13	0.61	0	14
	2 years and more	0.32	1.31	0	27
Vacant 500m	1 year	0.46	1.67	0	28
	2 years and more	1.16	3.82	0	61
Vacant 750m	1 year	0.97	3.12	0	38
	2 years and more	2.43	7.27	0	92
Garden 250m	1 year	0.01	0.12	0	4
	2 years and more	0.04	0.25	0	5
Garden 500m	1 year	0.04	0.24	0	4
	2 years and more	0.14	0.52	0	8
Garden 750m	1 year	0.07	0.37	0	7
	2 years and more	0.29	0.88	0	10
Improved 250m	1 year	0.01	0.12	0	5
	2 years and more	0.02	0.16	0	4
Improved 500m	1 year	0.03	0.25	0	9
	2 years and more	0.08	0.35	0	6
Improved 750m	1 year	0.07	0.44	0	14
	2 years and more	0.17	0.61	0	7
Observations	301,910				

Table 2 provides the mean, standard deviation (SD), minimum, and maximum counts of land bank parcels categorized as "vacant," "garden," and "improved" within 250-meter, 500-meter, and 750-meter buffer zones. These statistics cover acquisitions made 1 year and "2 years and more" before the observation period. The table reveals that vacant parcels are more prevalent within the buffer zones compared to garden and improved parcels. Moreover, the number of nearby vacant parcels decreases over time, with fewer recent acquisitions, while garden and improved parcels remain consistently low across all time periods. This suggests that vacant parcels are often acquired in larger quantities, while the transformation of properties into garden or improved parcels progresses at a slower pace.

Table 3. Number of Foreclosures in the Previous Year at Different Proximity Thresholds

Threshold	Mean	SD	Min	Max
250 meters	0.87	1.55	0	44
500 meters	2.81	3.81	0	50
750 meters	5.54	6.78	0	65

This table provides summary statistics for the number of foreclosures observed within 12 months across different spatial thresholds—250 meters, 500 meters, and 750 meters—from a given property.

Table 4. Summary Statistics for Housing and Neighborhood Characteristics

Variable	Mean	SD	Min	Max
Housing characteristics				
Housing Price Index	11.01	0.65	8.80	12.64
Age of home, less than 5 years	0.01	0.09	0	1
Age of home, 5 to 15 years	0.13	0.34	0	1
Age of home, 15 to 30 years	0.11	0.31	0	1
Condo	0.15	0.35	0	1
Two-family	0.06	0.24	0	1
Three-family	0.00	0.05	0	1
Neighborhood and community characteristic				
Black percentage	0.25	0.27	0	1
Median income (in 1000s)	5.63	2.62	0.25	17.82
Median rent (in 1000s)	0.95	0.25	0.25	2.19
Median value (in 1000s)	14.97	8.42	2.46	75.85
Percent with high school education	0.89	0.11	0.38	1
Percent below poverty	0.19	0.16	0	0.94
Population density	2293.07	1560.26	44.50	12184.61
Loan characteristics				
Ratio of conventional loan to average sales value by tract	1.14	0.43	0	7.07
Ratio of refinance loan to average sales value by tract	1.09	0.55	0	9.52
Applicant income for conventional loan applications	81.03	46.46	0	566.08
Applicant income for refinance applications	89.21	52.28	0	1122
Loan for conventional applications	136.36	71.52	0	884
Loan for refinance applications	122.91	62.41	0	829.31
Minority share of loans	0.17	0.19	0	1
Observations	301,910			

This table provides the summary statistics for various housing characteristics, neighborhood attributes, and loan-related factors that were used in the analysis. It includes key variables such as the Housing Price Index, various home age categories, family units (two-family, three-family), and neighborhood characteristics like the Black population percentage, median income, and median rent. Additionally, the table reports ratios and values related to loan applications, applicant income, and population density. The observations column shows the total number of observations used in the study.

Table 5: Impact of Nearby Foreclosures and Land Bank Acquisitions on Foreclosure Risks

	(1) 250 m	(2) 500 m	(3) 750 m
Nearby Foreclosures	0.0140***	0.00572***	0.00346***
	(0.0033)	(0.0015)	(0.0009)
Landbank Treatment (0/1)	-0.0540***	-0.0527***	-0.0481***
	(0.0178)	(0.0167)	(0.0160)
Housing characteristics			
Price index	-0.252***	-0.247***	-0.244***
	(0.0224)	(0.0226)	(0.0226)
Age of home, less than 5 years	0.0261	0.0450	0.0560
	(0.0686)	(0.0677)	(0.0671)
Age of home, 5 to 15 years	0.177***	0.180***	0.183***
	(0.0212)	(0.0212)	(0.0212)
Age of home, 15 to 30 years	0.0992***	0.103***	0.105***
	(0.0230)	(0.0230)	(0.0230)
Condo	-0.174***	-0.171***	-0.170***
	(0.0217)	(0.0218)	(0.0218)
Two-family	-0.0820***	-0.0841***	-0.0854***
	(0.0238)	(0.0239)	(0.0239)
Three-family	-0.0973	-0.0988	-0.1020
	(0.1410)	(0.1410)	(0.1410)
Neighborhood and community characteristic			
Black percentage	0.0690**	0.0684**	0.0674**
	(0.0336)	(0.0337)	(0.0337)
Median income (in 1000s)	-0.0135**	-0.0142**	-0.0145***
	(0.0056)	(0.0056)	(0.0056)
Median rent (in 1000s)	-0.0190	-0.0197	-0.0189
	(0.0328)	(0.0329)	(0.0329)
Median value (in 1000s)	0.00519**	0.00519**	0.00514**
	(0.0021)	(0.0021)	(0.0021)
Percent with high school education	0.0579	0.0677	0.0735
	(0.0787)	(0.0789)	(0.0790)
Percent below poverty	-0.107*	-0.118**	-0.124**
	(0.0561)	(0.0563)	(0.0564)
Population density	0.0000	0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)

Loan characteristics			
Ratio of conventional loan to average sales value by tract	0.0806***	0.0812***	0.0815***
	(0.0201)	(0.0201)	(0.0201)
Ratio of refinance loan to average sales value by tract	-0.0231	-0.0241	-0.0250
	(0.0193)	(0.0193)	(0.0193)
Applicant income for conventional loan applications	0.0002	0.0002	0.0002
	(0.0002)	(0.0002)	(0.0002)
Applicant income for refinance applications	0.0000	0.0000	0.0000
	(0.0002)	(0.0002)	(0.0002)
Loan for conventional applications	-0.00365***	-0.00368***	-0.00369***
	(0.0004)	(0.0004)	(0.0004)
Loan for refinance applications	0.000917***	0.000933***	0.000953***
	(0.0003)	(0.0003)	(0.0003)
Minority share of loans	0.0260	0.0304	0.0336
	(0.0396)	(0.0396)	(0.0396)
Year Fixed Effects	Yes	Yes	Yes
Constant	1.072***	1.014***	0.976***
	(0.2400)	(0.2410)	(0.2420)
Observations	301,910	301,910	301,910

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

This table presents the results from a discrete-time duration model estimating the likelihood of foreclosure for properties located within 250 meters, 500 meters, and 750 meters of land bank acquisitions. The key variables of interest include the presence of nearby foreclosures and cumulative land bank treatment, which captures whether land bank interventions occurred within the buffer zones over the past several years. The table also controls for housing characteristics (e.g., property age, price index), neighborhood attributes (e.g., median income, racial composition), and loan characteristics (e.g., loan-to-value ratios).

Table 6: Impact of Residential Vacant and Residential Improved Land Bank Acquisitions on Foreclosure Risks

	(1) 250 m	(2) 500 m	(3) 750 m
Nearby Foreclosures	0.0139***	0.00591***	0.00383***
	(0.0033)	(0.0015)	(0.0009)
Residential Vacant Treatment (0/1)	-0.0398**	-0.0352**	-0.0345**
	(0.0180)	(0.0172)	(0.0165)
Residential Improved Treatment (0/1)	-0.0838**	-0.0582***	-0.0460**
	(0.0335)	(0.0220)	(0.0190)
Control Variables	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Constant	1.185***	1.188***	1.135***
	(0.2430)	(0.2450)	(0.2440)
Observations	301,910	301,910	301,910

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6 presents the results of a discrete-time duration model analyzing the differential impacts of "Residential Vacant" and "Residential Improved" land bank acquisitions on the likelihood of future foreclosures. The table displays the effect of nearby foreclosures and land bank treatments (vacant and improved) across three buffer zones: 250 meters, 500 meters, and 750 meters. The results show that both vacant and improved property interventions reduce foreclosure risks, with improved properties having a stronger impact. The nearby foreclosure variable continues to exhibit a significant contagion effect, increasing foreclosure probability across all distances. Control variables and year fixed effects are included in the analysis to account for additional factors influencing foreclosure risks.

Table 7. Effects of Different Types Land Bank Acquisitions on Foreclosure Risk

	(1) 250 m	(2) 500 m	(3) 750 m
Nearby Foreclosures	0.0137***	0.00589***	0.00379***
	(0.0033)	(0.0015)	(0.0009)
Vacant Treatment (0/1)	-0.0375**	-0.0470***	-0.0492***
	(0.0183)	(0.0178)	(0.0172)
Garden Treatment (0/1)	0.0272	0.0401*	0.0346*
	(0.0293)	(0.0207)	(0.0189)
Residential Improved Treatment (0/1)	-0.0878***	-0.0650***	-0.0543***
	(0.0337)	(0.0226)	(0.0201)
Control Variables	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Constant	1.164***	1.192***	1.158***
	(0.2430)	(0.2450)	(0.2450)
Observations	301,910	301,910	301,910

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7 presents the probit regression results estimating the likelihood of future foreclosures based on proximity to three types of land bank acquisitions—vacant, garden, and improved properties—within 250, 500, and 750 meters of the properties.

Table 8. Impact of the Number of Land Bank Acquisitions on Foreclosure Risks

	(1) 250 m	(2) 500 m	(3) 750 m
Nearby Foreclosures	0.0133***	0.00508***	0.00308***
	(0.0033)	(0.0015)	(0.0009)
# of Residential Vacant	-0.0020	0.0012	0.0009
	(0.0038)	(0.0015)	(0.0009)
# of Residential Improved	-0.0845***	-0.0368***	-0.0181**
	(0.0296)	(0.0142)	(0.0090)
Control Variables	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Constant	1.086***	1.023***	0.976***
	(0.2400)	(0.2410)	(0.2420)
Observations	301,910	301,910	301,910

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8 presents the results of a discrete-time duration model analyzing the impact of the number of land bank acquisitions—categorized into residential vacant and residential improved properties—on the likelihood of future foreclosures within 250-meter, 500-meter, and 750-meter buffer zones. The table includes nearby foreclosures as a control variable along with additional housing, neighborhood, and loan characteristics.

Table 9. Impact of Land Bank Acquisitions on Foreclosure Risk by Property Type and Acquisition Timing

	(1) 250 m	(2) 500 m	(3) 750 m
Nearby Foreclosures	0.0133***	0.00513***	0.00309***
	(0.0033)	(0.0015)	(0.0009)
# of Residential Vacant in 1 year	-0.0210**	-0.0108**	-0.00715**
	(0.0106)	(0.0048)	(0.0029)
# of Resential Vacant in 2 years and more	0.0049	0.00553**	0.00379***
	(0.0051)	(0.0022)	(0.0013)
# of Residential Improved in 1 year	-0.0538	-0.0258	-0.0123
	(0.0528)	(0.0254)	(0.0158)
# of Residential Improved in 2 years and more	-0.0969***	-0.0392**	-0.0191*
	(0.0354)	(0.0174)	(0.0114)
Control Variables	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Constant	1.094***	1.031***	0.990***
	(0.2400)	(0.2410)	(0.2420)
Observations	301,910	301,910	301,910

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

This table presents the results of a discrete-time duration model analyzing the effect of land bank acquisitions on future foreclosure risks. The analysis distinguishes between residential vacant properties and residential improved properties, categorized by acquisition timing: within 1 year or 2 years and more. The model accounts for properties located within 250 meters, 500 meters, and 750 meters from the land bank acquisitions.

Figure 1. Spatial Distribution of Residential Parcels in Franklin County (2011-2018)

This figure illustrates the spatial distribution of residential parcels in our sample across Franklin County, Ohio. The white areas represent non-residential parcels or those not part of the analysis, while black areas highlight the residential parcels that are the focus of this study. These parcels are observed over the years 2011 to 2018, with the figure providing a geographic context for understanding foreclosure risks and land use patterns across urban and suburban areas in the county. The visual clearly distinguishes between different land use types, emphasizing the concentration of residential parcels in both densely populated urban regions and more dispersed suburban zones.

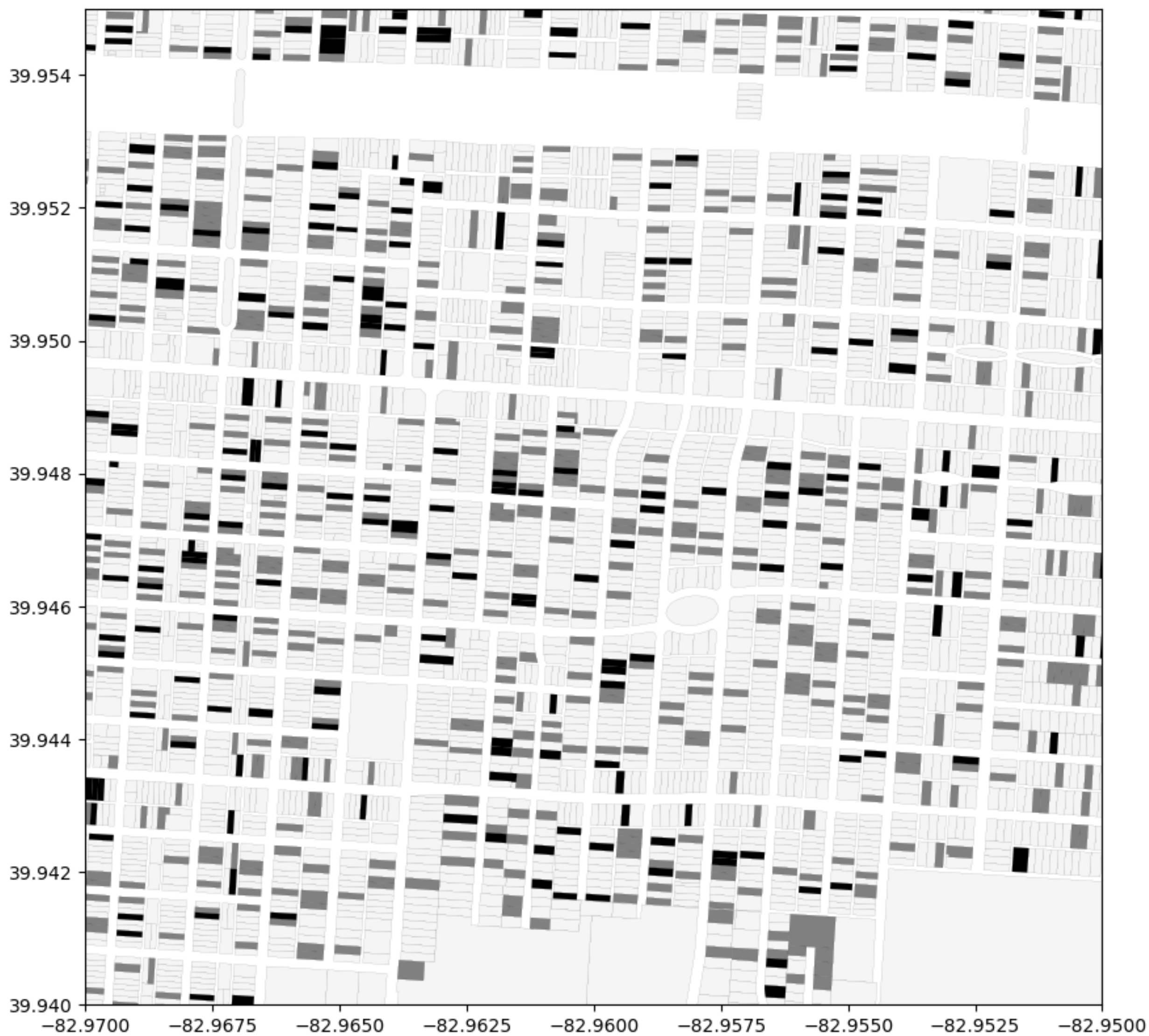

Figure 2: Foreclosure and Survival Status of Residential Parcels

Figure 2 illustrates the spatial distribution of residential parcels in a specific area of Franklin County, focusing on foreclosure statuses between 2011 and 2018. Parcels are categorized as follows: foreclosed parcels are highlighted in black, parcels that survived foreclosure during this period are shown in grey, and parcels with no transaction data or missing foreclosure information that are in the sample are displayed in white. This zoomed-in map provides a detailed view of the foreclosure patterns, showing how risks are geographically concentrated in certain areas.

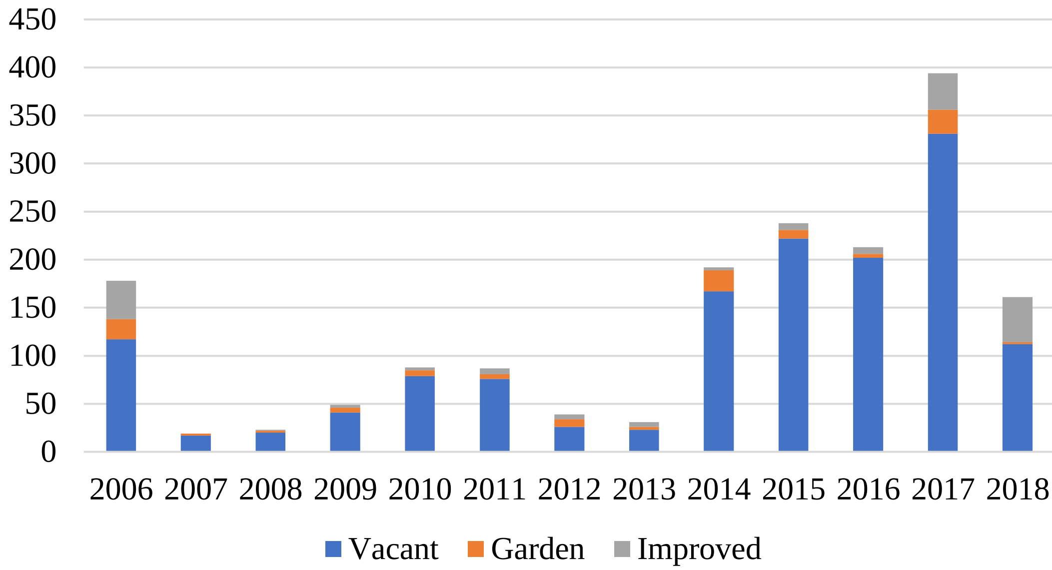

Figure 3: Annual Distribution of Land Bank Acquisitions by Property Type (2006–2018)

Figure 3 displays the number of parcels acquired by the Columbus Land Bank from 2006 to 2018, categorized into three types: Vacant, Garden, and Improved. Most acquisitions consist of "Vacant" parcels, with noticeable increases in 2014 and peaking in 2017. The "Garden" and "Improved" categories make up a smaller portion of acquisitions, with "Garden" parcels showing minor growth starting in 2014 and "Improved" parcels peaking in 2017 and 2018. This trend highlights the growing emphasis on addressing urban blight and stabilizing neighborhoods during the foreclosure crisis.

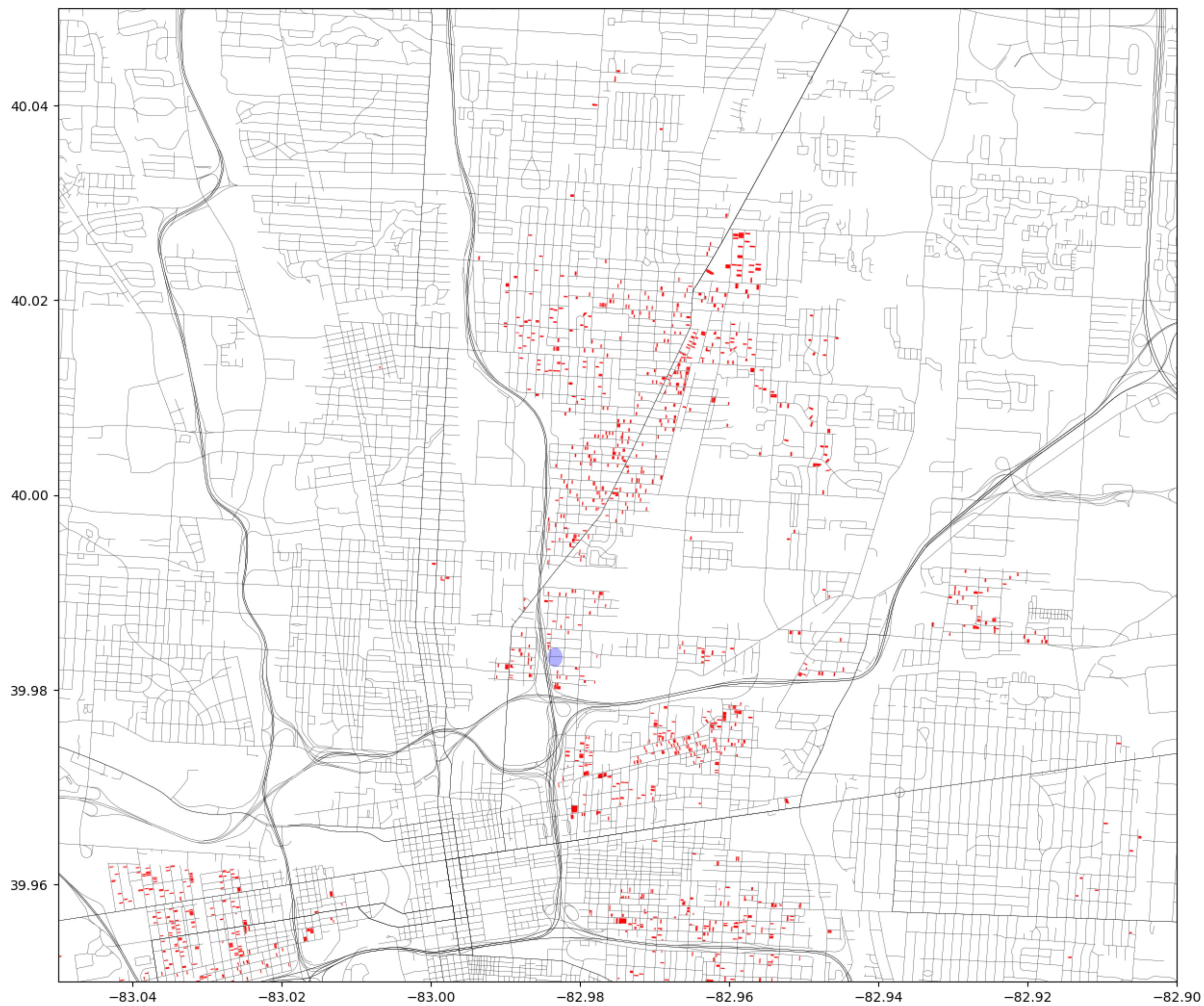

Figure 4: Spatial Distribution of Land Bank Acquisitions in Franklin County

This figure depicts the spatial distribution of land bank acquisitions in Franklin County. The purple dot represents downtown Columbus, and the clustering of red parcels around this area indicates a high concentration of land bank interventions, particularly in neighborhoods near the urban core. The geographic pattern suggests a focus on revitalizing areas most impacted by foreclosure and urban decline, with the majority of acquisitions located in the central and eastern parts of the city.

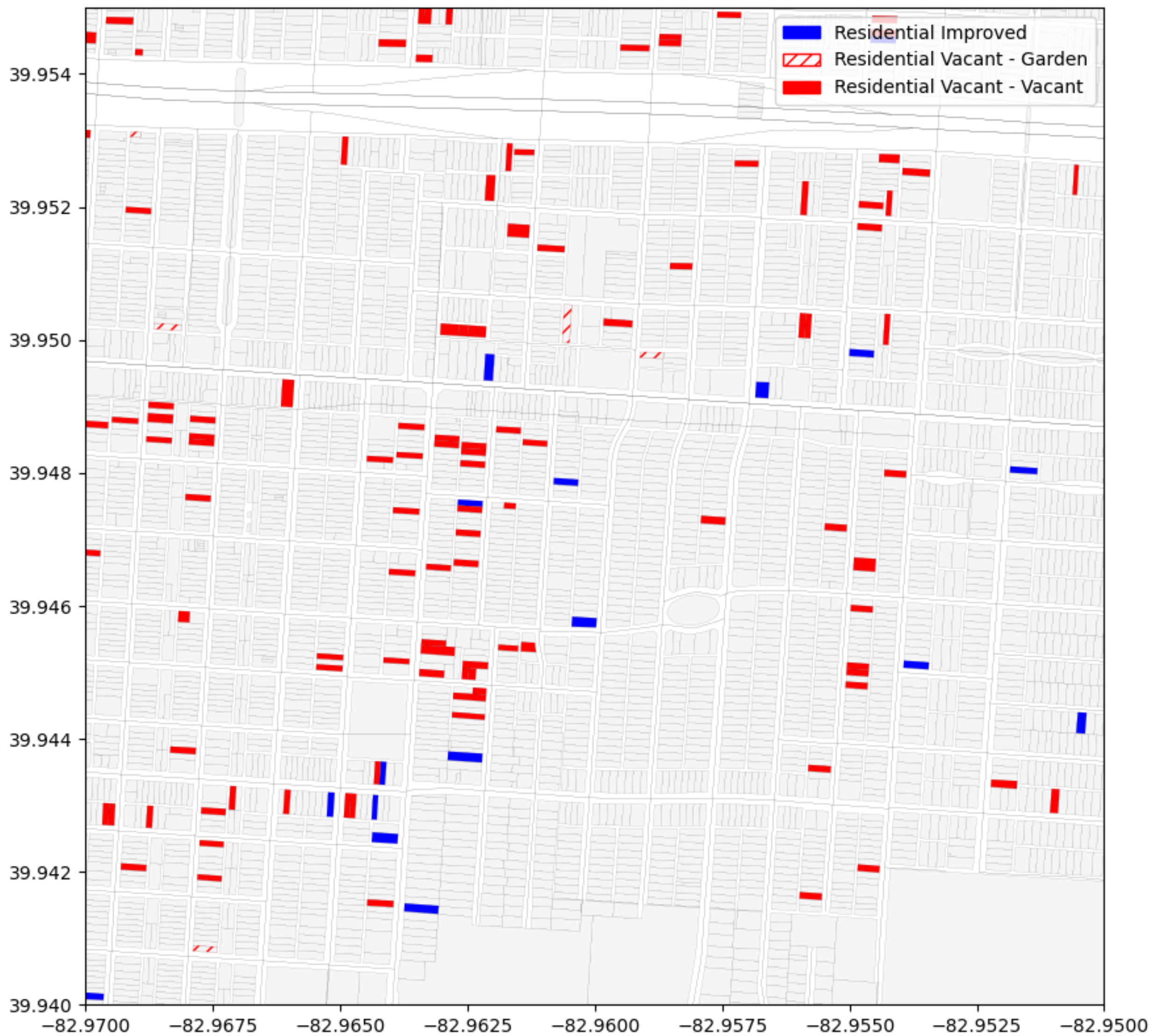

Figure 5: Zoomed-In View of Land Bank Acquisitions in a Franklin County Neighborhood

The figure provides a spatial representation of land bank acquisitions in Franklin County, categorized into three distinct property types: Residential Improved (blue), Residential Vacant – Garden (red with striped hatching), and Residential Vacant – Vacant (solid red). The map highlights the distribution of these parcels, showing a concentration of Vacant properties in central neighborhoods, suggesting a focus on areas heavily affected by urban decline. The Garden parcels, represented by red stripes, are fewer and more dispersed, indicating selective intervention for community revitalization through land repurposing. Improved properties, shown in blue, are distributed throughout the area, reflecting efforts to rehabilitate residential structures.

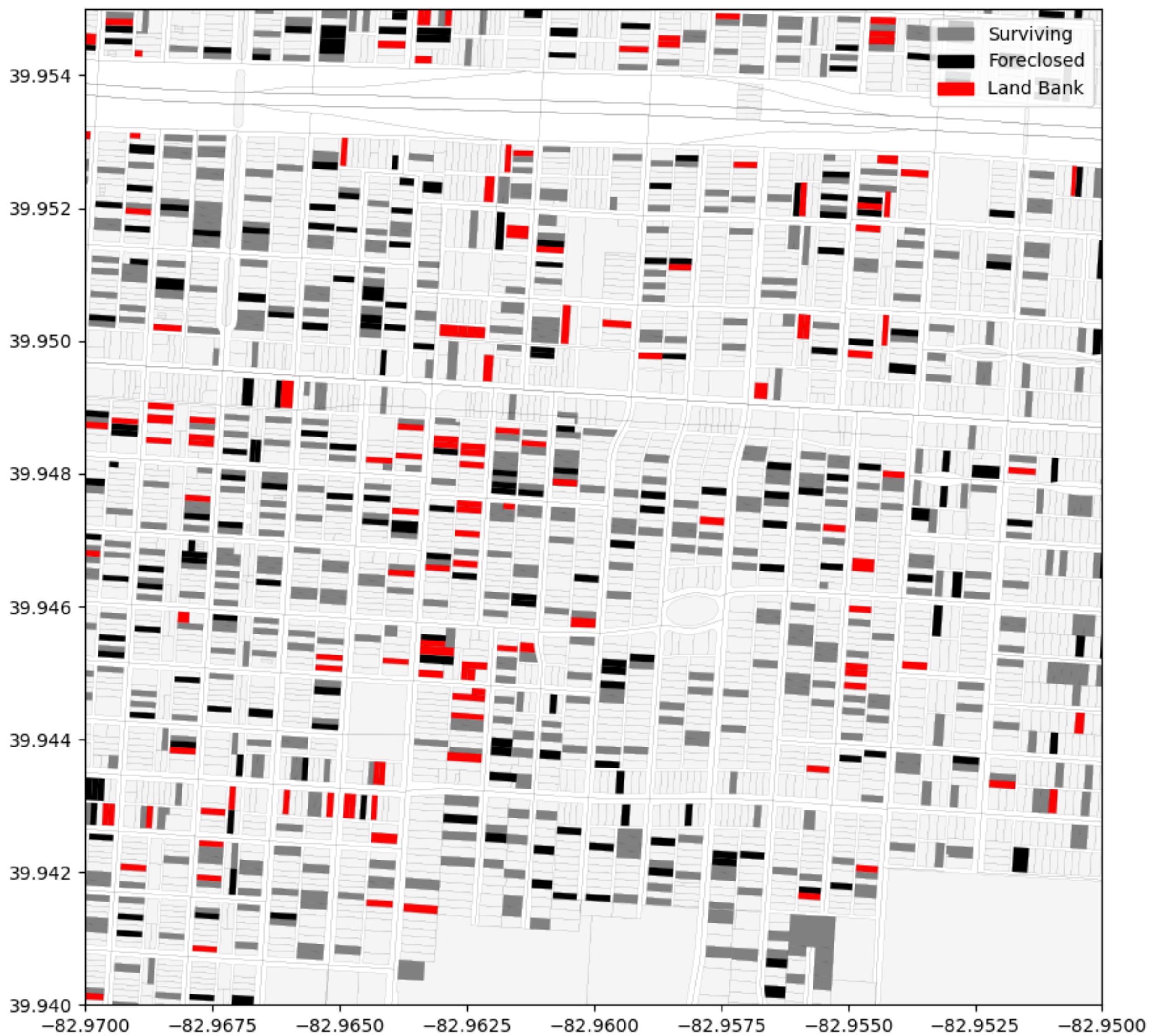

Figure 6: Spatial Distribution of Survived, Foreclosed, and Land Bank Acquired Parcels

This map provides a detailed view of a neighborhood within Franklin County, showing the spatial distribution of three types of parcels: surviving (grey), foreclosed (black), and land bank acquired (red). The clustering of land bank properties in areas with high foreclosure risk highlights the targeted nature of the land bank interventions, aimed at stabilizing neighborhoods severely impacted by the foreclosure crisis.

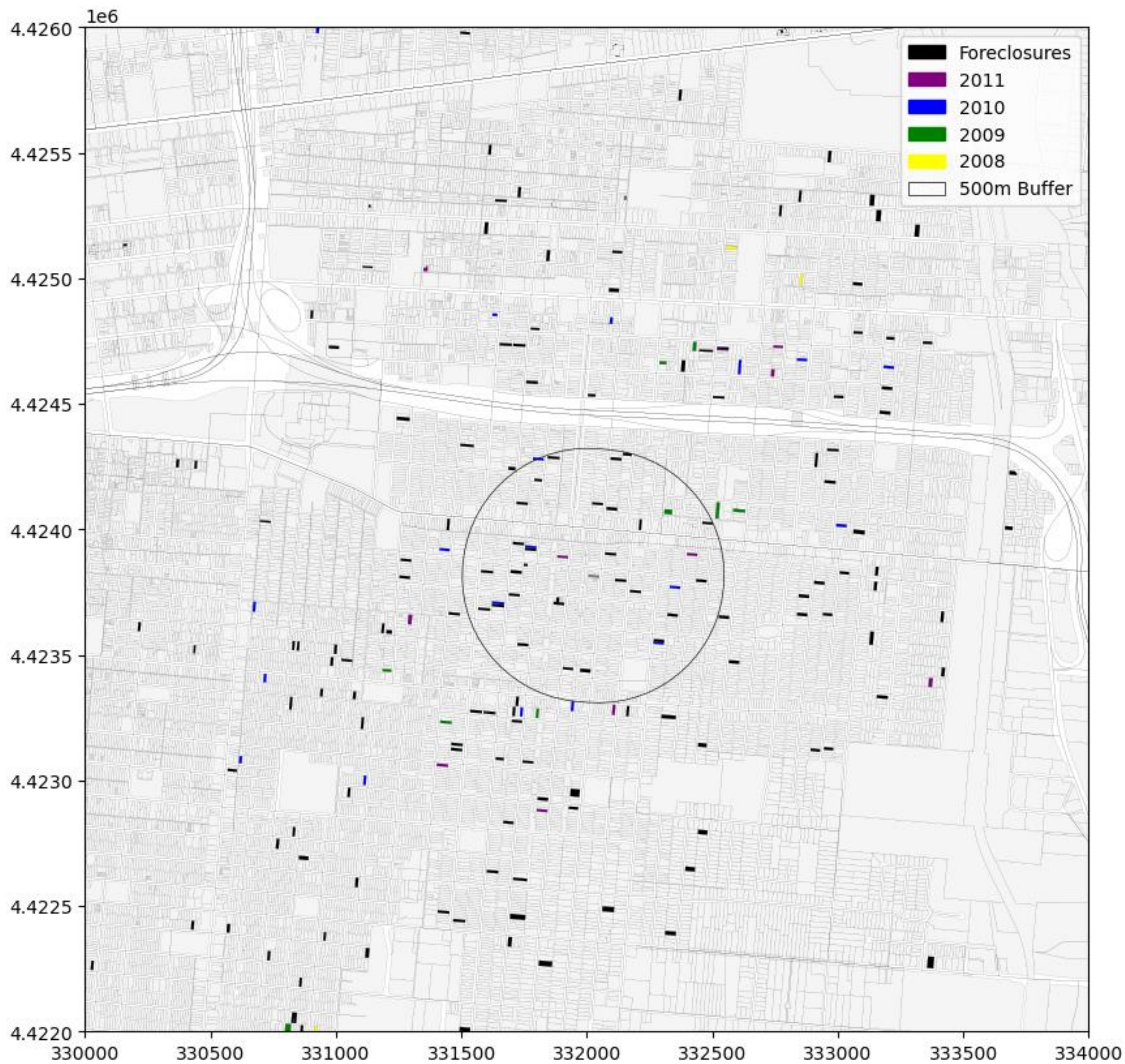

Figure 7. Spatial Example of Land Bank Acquisitions and Foreclosure Density (2012)

Figure 7 illustrates the spatial relationship between a parcel observed in 2012 (highlighted in grey) and nearby foreclosures and land bank acquisitions within a 500-meter buffer. Black parcels indicate foreclosures from the previous year (2011), while purple parcels represent land bank acquisitions made in 2011. Blue parcels show land bank acquisitions from two years prior (2010), green parcels reflect acquisitions from three years prior (2009), and yellow parcels represent acquisitions from four years prior (2008).

Appendix A

To construct the index, we used transaction data from the Franklin County Auditor's Office, which provides detailed information on property characteristics such as lot size, square footage, number of bathrooms, total number of rooms, property age, and number of stories. Including these variables in the regression allowed us to estimate their specific effects on property prices while controlling for neighborhood-level fixed effects. The fixed-effects model accounts for unobservable factors that remain constant over time within block groups, such as the presence of schools, parks, or other local amenities. This ensures the index focuses on within-neighborhood variations in housing values.

This approach enabled the development of a block group-level price index that isolates the impact of structural housing attributes from broader market trends. The index provides a localized measure of housing prices sensitive to both the specific characteristics of each property and the broader neighborhood context. This enables a more accurate assessment of the effects of foreclosures and land bank acquisitions on property values within a given area, independent of broader market fluctuations or unchanging neighborhood factors.

The descriptive statistics for the housing price index are shown in Table 4. The average housing price index across the sample is approximately 11.01, with a standard deviation of 0.65, indicating variation in housing values across the sample. The range extends from 8.80 to 12.64, reflecting the diverse housing stock in the Columbus area. These figures suggest a wide distribution of property values, providing a robust foundation for analyzing the impact of land bank interventions on foreclosure risks and neighborhood stability. By leveraging this fixed-effects approach, we ensure that the housing price index effectively captures the dynamics of property values in Columbus, Ohio.