# The Role of Public Investments in Generating Property Wealth: Evidence from Cuyahoga County, Ohio*

Valencia Prentice[†] Xiaozhou Ding[‡]
*Cleveland State University* *Dickinson College*

December 2023

**Abstract**

Place-based public investments are frequently used by local governments for neighborhood revitalization. In this study, we investigate the impact of Community Development Block Group Grant (CDBG) funded investments on residential property values in Cuyahoga County, Ohio, to assess their effectiveness in improving neighborhood quality. Capitalization theory posits that if the market values the addition of public investments, then the demand for properties would rise in response to that addition, ultimately leading to an increase in property values. While existing research supports the capitalization effect of CDBG investments, the dynamic timing effects of capitalization remain less studied. Using parcel level data for the period 2000 to 2019, we employ a difference-in-differences model to examine these effects. Our findings indicate that CDBG projects significantly enhance residential property values in nearby areas, offering valuable policy insights. Additionally, our event-study analysis reveals that this effect typically becomes evident around two years after the completion of CDBG projects. Strategic targeting of interventions in low-wealth neighborhoods could substantially increase property wealth for homeowners in these areas.

**Keywords:** Place-based public investments, CDBG, Property Values, Difference-in-Differences
**JEL Classification Codes:** H72, R53

*We are grateful for the helpful comments from Paul Carrillo, Ed Coulson, Daphne Kenyon, Dan McMillen, Amy Ellen Schwartz, Darla Munroe, Caroline Weber, and conference and seminar participants at the Lincoln Institute of Land Policy and National Tax Association Annual Conference.

[†]Maxine Goodman Levin School of Urban Affairs, Cleveland State University. Email: v.prentice@csuohio.edu.
[‡]Department of Economics, Dickinson College. Email: dingx@dickinson.edu.

# 1 Introduction

Place-based public investments, also known as area-based public investments, are frequently employed by local governments for neighborhood revitalization. The primary goal is to revive low-wealth, low-income, and declining neighborhoods by attracting businesses, creating employment opportunities, and generating property wealth (Accordino and Fasulo, 2013). The terms area-based and place-based are used interchangeably throughout this paper. Consistent with the study by Foell and Pitzer (2020), we define place-based public investments as preservation investments deployed to geographically targeted areas with the goal of improving their social and economic conditions.

The impact of place-based interventions has garnered considerable attention in recent research (Walker et al., 2002; Newell, 2010; Aarland, Osland, and Gjestland, 2017; Theodos, Stacy, and Ho, 2017). This is due to the influence that locational quality has on the current and future well-being of residents, affecting outcomes such as educational attainment (Gutiérrez Romero, 2009) and productivity (Kantor and Whalley, 2014), employment opportunity (Ding and Knaap, 2002), and health outcomes (Rollings, Wells, and Evans, 2015; Kose, O'Keefe, and Rosales-Rueda, 2022). Therefore, understanding whether place-based public investments enhance local amenities and achieve the desired economic impact is crucial for both researchers and policymakers (Almagro, Chyn, and Stuart, 2023).

Although area-based investments have been extensively studied, their effectiveness has been a subject of great debate. Some scholars express skepticism about their efficacy, suggesting inefficient allocation, lack of holistic regional planning and the maldistribution of resources (DeHaven, 2010; Rae, 2011). Others, however, maintain that there have been some successes in improving neighborhood quality (Galster et al., 2004; Pooley, 2014; Neumark and Simpson, 2015; Overton and Stokan, 2023).

This study aims to contribute to the ongoing discourse by investigating the impact of place-based policies on neighborhood quality. We focus on the connection between property values and neighborhood valuation (Almagro, Chyn, and Stuart, 2023). Economic theory suggests that property market values are a function of neighborhood attributes (Rosen, 1974), with property prices reflecting individuals' willingness to pay for amenities. For example, attributes such as access to jobs, environmental amenities, commercial businesses, and public services are reflected in property values (Ding and Knaap, 2002). This relationship forms the basis for evaluating neighborhood quality through property values in many studies (Ding and Knaap, 2002; Pooley, 2014; Overton and Stokan, 2023).

In line with previous research, we use property values to analyze how place-based approaches affect neighborhoods. More specifically, we ask: do public investments funded by the Community Development Group Block Grant (CDBG) contribute to wealth generation within neighborhoods? CDBG public improvements include street improvements, sidewalks, parks and recreation, tree planting, and water and sewer improvements. CDBG investments are appropriate for testing the effects of place-based policies given that "the overall impact of the CDBG program is staggering" (Overton and Stokan, 2023, p. 4). About 33 million individuals benefited from CDBG public improvements between 2005 and 2013 (Theodos, Stacy, and Ho, 2017).

Our research utilizes housing transaction data from Cuyahoga County, Ohio, spanning 2000 to 2019. We examine the effectiveness of public investments in revitalizing local neighborhood housing prices through a difference-in-differences (DID) model and event study approach. We define homes close to each CDBG public improvement project as treated and those further away as controls. By comparing sales data for these homes, we estimate a DID model to evaluate the causal effect of public improvements on house values. We also employ an event-study approach to analyze the yearly differences in housing sale prices between treated and control homes, up to five years before and after the completion of each CDBG project.

The DID results indicate that area-based public investments contribute to property wealth generation within neighborhoods. Properties within 500 feet of a completed CDBG project tend to appreciate faster than those further away. On average, homes near CDBG projects have experienced a 6.6 percent increase in housing prices, with most gains occurring two years post-completion. Our sub-sample analysis shows a similar effect for homes both below and above the median sale price, suggesting a widespread effect across neighborhoods. These findings have significant policy implications, indicating that targeted interventions in low-wealth areas can enhance property wealth for homeowners.

Our paper makes two key contributions. First, it uses a more refined geographic scale as the unit of analysis, focusing on the localized effects of CDBG public investments rather than overall trends in larger areas. This approach differs from studies like those by Pooley (2014) and Walker et al. (2002), which analyzed impacts on median home values in census tracts. Second, our study provides a nuanced examination of the dynamic timing effects of interventions, employing a DID estimation technique over a one to five-year period post-intervention.

The rest of the paper is structured as follows. The next section briefly discusses the literature related to the Community Development Block Grant projects and its impacts on neighborhoods. Section 3 presents the data used in this paper and Section 4 discusses our empirical strategy. Section 5 provides the results of our empirical estimation and the conclusion is presented in Section 6.

# 2 Related Literature

## 2.1 Background on the Community Development Block Grant (CDBG)

The CDBG program was established in 1974 through the Housing and Community Development Act to provide federally funded grants to local governments (Overton and Stokan, 2023). The Act paved the way for a collaborative approach for federal, state, and local governments to systematically tackle the economic, social, and environmental challenges that localities faced. These challenges resulted from population growth, the rise in the number of low-income residents and limited public and private investments (Galster et al., 2004). Created with the main objective of revitalizing distressed neighborhoods to ensure their viability, the CDBG program "consolidated a range of existing federal programs (including urban renewal, model cities, neighbourhood facilities and water, sewer and open space programs) in a single funding vehicle" (Pomeroy, 2006, p. 5).

Therefore, rather than applying separately for assistance with each of these categories, local governments could now benefit from a more streamlined application process that ensured a steady flow of funds annually (Rohe and Galster, 2014).

Entitlement communities receive 70% of the CDBG funds. Entitlement communities are cities with a population of 50,000 or more residents and counties with a population of 200,000 or greater (Stokan, Hatch, and Overton, 2022). The CDBG State Program receives the remaining 30% of the federal funds. The State Program allows states to allocate grant awards to non-entitlement communities. Non-entitlement communities are cities with a population of less than 50,000 and counties with a population of less than 200,000 (Stokan, Hatch, and Overton, 2022). Entitlement funds are allocated based on a needs-based formula which considers several factors including population growth, poverty rates, overcrowding, and the condition of building structures (Brooks, Phillips, and Sinitsyn, 2011).

The CDBG program is considered one of the most successful initiatives in the history of urban regeneration in the United States (Pomeroy, 2006). It is one of the largest forms of support that local governments receive from the federal government. Although the amount appropriated for the program has declined by 80 percent, in real dollars, since peaking in 1979, local governments benefit from the steady flow of about $3 billion dollars allocated to the program each year (Theodos, Stacy, and Ho, 2017). Grant recipients can use allocated funds to support any of the three program's national objectives: (1) help low-to-moderate income (LMI) families, (2) deal with blight or (3) address any pressing development needs (Brooks, Phillips, and Sinitsyn, 2011).

Local governments have some discretion in the activities they pursue to achieve these objectives. Funds can be used for housing rehabilitation, economic development, public services, or public improvements (Pomeroy, 2006; Overton and Stokan, 2023). Public investments may include sidewalk improvements, public facility improvements, tree planting, water and sewer improvements, and investments in parks and recreation. Grants can also be used to improve the well-bring of vulnerable populations, for example, cash transfers (Stokan, Hatch, and Overton, 2022). Grant recipients may choose to distribute their funds evenly across all their communities or they may choose to concentrate them in specific communities (Overton and Stokan, 2023). Most grant recipients are subject to certain restrictions. For instance, by statute, they are not allowed to spend more than 15% of their grant funds on certain activities such as crime prevention, healthcare, and childcare services (Pomeroy, 2006). In addition, the legislation and regulation specify that over a three-year period approximately 70% of the funds awarded must be spent to benefit LMI communities (Rohe and Galster, 2014). LMI status is determined for households with incomes less than 80% of the median income for their area.

CDBG funds awarded are expected to improve the economic and social conditions of neighborhoods chosen for investments by containing the deterioration of community infrastructure, preserving the existing housing stock, providing improved community services, and preventing conditions that contribute to health and safety issues (Galster et al., 2004). In addition, for areas that are experiencing population loss and a shrinking tax base, the investments are expected to attract additional private investments that foster economic growth (Galster et al., 2004). Given the role that CDBG funds are expected to play in the revitalization of neighborhoods, an investigation of the program's impact on communities have remained a perennial question among scholars and policy analysts.

## 2.2 The Impact of CDBG on Neighborhoods

The impact of CDBG investments on neighborhood quality is well documented in the literature (Galster et al., 2004; Galster, Tatian, and Accordino, 2006; Pooley, 2014; Overton and Stokan, 2023). Galster et al. (2004) present a conceptual model which explains that CDBG investments can directly or indirectly stimulate positive changes within neighborhoods. They explain that grant funds invested in upgrading community facilities, public infrastructure, and other activities directly create value for neighborhoods. CDBG investments also have an indirect effect because they change perceptions about neighborhoods (Pooley, 2014). Due to highly visible public investments, private investors and homeowners may perceive that the economic prospects of neighborhoods are on the rise and are expected to continue increasing (Walker et al., 2002; Pooley, 2014). Thus, private investors and homeowners may become motivated to complement local governments by making their own investments to improve neighborhoods.

Researchers explored how CDBG investments affect neighborhoods by using a variety of economic and social outcome variables. Galster et al. (2004) examined the effects of CDBG spending on the amount of home purchase loans originated, mortgage approval rates, and the number of businesses. Walker et al. (2002) studied the relationship between CDBG projects and neighborhood employment. Yet, Brooks, Phillips, and Sinitsyn (2011) analyzed the responsiveness of municipal revenues to the CDBG program.

The impact on property values has been most frequently examined (Galster, Tatian, and Accordino, 2006; Pooley, 2014; Overton and Stokan, 2023). Hedonic theory has been advanced to explain the relationship between place-based public investments and property values (Aarland, Osland, and Gjestland, 2017). The theory assumes that property values can be used to measure the willingness to pay for certain characteristics of the property that cannot be valued using normal competitive market prices. Hedonic prices are the implicit prices of a property's attributes that guide the locational decisions of individuals (Rosen, 1974). Such attributes may include the structural characteristics of the property, as well as neighborhood amenities.

Public investments are examples of neighborhood amenities that increase the attractiveness of neighborhoods. As the quantity and quality of public investments increase within a jurisdiction, demand for properties increases (Tiebout, 1956). Consequently, public investments are capitalized into property values (Oates, 1969; Mathur, 2008; García, Montolio, and Raya, 2010; Stadelmann and Billon, 2015). Scholars have repeatedly found that public investments such as highway construction (Chernobai, Reibel, and Carney, 2011), parks and recreational facilities (Kovacs, 2012) and public transit (Bartholomew and Ewing, 2011) positively capitalize into property values. Public investments funded by the CDBG improve the quality of neighborhoods, hence, they are capitalized into property values (Galster, Tatian, and Accordino, 2006; Pooley, 2014). Edmiston (2012) theorizes that new construction and other improvements contain the negative externality effect of undesirable neighborhood attributes which may exist prior to targeted investments. These attributes may include dilapidated buildings, graffiti, and poorly maintained streets (Edmiston, 2012). CDBG investments boost confidence in the neighborhoods leading to capitalization (Galster, Tatian, and Accordino, 2006). To illustrate, targeted communities in Richmond, Virginia benefiting from public investments, including CDBG-backed investments, realized faster property price appreciation than neighborhoods that were not targeted for such investments (Galster, Tatian, and Accordino, 2006). Simply put, property values in target areas increased 10.85% faster per year than those in non-targeted areas. In a similar study, Pooley (2014) investigated how public investments funded by the CDBG impact property values. She used data for neighborhoods in Philadelphia for the period 1994 to 2008. She found that census tracts that received above-threshold CDBG and other funds realized a higher property value appreciation than census tracts receiving less funds.

In a more recent study, Overton and Stokan (2023) examined the differential impacts of certain types of CDBG projects on different classes of properties. Their sample comprised of parcel level data for Dallas County for the period 2004 and 2017. They operationalized property values using two indicators: (1) residential property values and (2) commercial property values. They argued that CDBG investments in developmental and redistributive activities may have a differential impact on residential and commercial properties. They define developmental activities as improvements undertaken to attract business to neighborhoods, such as improvements in the housing stock and infrastructure. Redistributive expenditures are defined as spending on low-income families such as welfare, public health, and non-infrastructure housing. Using fixed effects methods, Overton and Stokan (2023) found that developmental CBDG investments positively impact commercial but not residential values where the investment occurs. The study also finds that redistributive CDBG expenditures negatively impact commercial properties where the investment occurs, while the effect on residential properties is positive. Based on the foregoing, we hypothesize that CDBG public investments are capitalized into property values.

# 3 Data

## 3.1 CDBG Data

The CDBG data was obtained from the Housing and Urban Development (HUD) Integrated Database and Information System (IDIS). The IDIS contains data from as far back as 1982 for all CDBG funded projects including public services, acquisition, economic development, housing, housing services, public improvements, and other projects. We chose to examine the impact of public improvement projects because they constituted a significant portion of the total resources allocated to the CDBG program. Public improvements accounted for approximately 44 percent of all the money spent during the period 1982 to 2020. We restricted the sample period to 2000 to 2019, which allows us to focus on a more recent period that better reflects the current economic conditions.

The HUD records the exact location of each CDBG project. This allowed us to geocode the addresses and extract those projects completed within Cuyahoga County. Cuyahoga County is an appropriate setting for testing the effects of CDBG investments, given that it is home to several legacy cities. These cities struggle with challenges such as economic contraction and population loss, making them frequent targets for urban rejuvenation efforts. Therefore, examining the effects of place-based investments in Cuyahoga County can inform the development of effective strategies for revitalizing urban communities. Figure 1 shows the geographical distribution of CDBG projects in Ohio, with a zoomed-in figure highlighting CDBG projects in Cuyahoga County.

## 3.2 Housing Sales Data

Our housing sales dataset is sourced from the Northeast Ohio Community and Neighborhood Data for Organizing (NEOCANDO). It includes detailed transaction records for each parcel in Cuyahoga County, Ohio, covering the period from 2000 to 2019. For each residential property, we have comprehensive information regarding its physical characteristics such as the number of bedrooms, bathrooms, lot size, building square footage, year built, building style, and exterior finish, along with its transaction history (e.g., sale date, price, and sale type). We restrict our sample to arm's length transactions of single-family houses.[1] Figure 3 illustrates the mean sales price trend in Cuyahoga County.

To assess the impact of the CDBG public investments, we create a binary variable indicating whether a sale occured within a CDBG designated area. The designation was determined using Geographic Information Systems (GIS) analysis. First, a 1000-foot buffer is set around each completed CDBG project, following methodologies used in studies like Haninger, Ma, and Timmins (2017) that examines the local housing price dynamics in response to brownfield cleanup , to select parcels for analysis. This process yields 10,239 unique parcels. Second, a 500-foot buffer around each CDBG project is defined to determine the CDBG designated area, in line with the approach of Edmiston (2012) where they construct 500-foot rings around investment projects to determine the impact on property values. Figure 2 provides an example of how we determine treated and control homes.

Sales within the 500-foot buffer were considered inside the CDBG project boundary, while those outside this buffer but within the 1000-foot range were deemed outside the CDBG project boundary. The goal is to compare property values inside and outside the CDBG-designated areas. Parcels within the 500-foot boundary were coded as treated and parcels further than 500 feet away but within the 1000 feet distance are considered as our controls.

Table 1 presents summary statistics of major house attributes for treated and control groups before the completion of each CDBG project. Homes within the 500-foot buffer are categorized as treated in column (1), while those beyond 500 feet but less than 1000 feet from the CDBG site are controls in column (2). On average, homes closer to CDBG projects are priced at $76,995, which is $1,424 higher than those further away, representing about 4 percent of the average house value. However, this price difference is not statistically significant. Other physical characteristics are also similar between the two groups. Treated homes are generally larger, newer, and have more bedrooms and bathrooms. While the number of full bathrooms differs statistically, with an average difference of 0.048, this is economically minor. Treated homes also tend to have fewer half

[1]In terms of the deed type selection, we focus on warranty deed, the most common deed type in the state of Ohio.

bathrooms and are less likely to have firewalls but more likely to be colonial in style. This similarity indicates that the selection of CDBG sites is not influenced by local housing characteristics.

# 4 Empirical Methodology

## 4.1 Difference-in-Differences Estimation

Consider $P_{itk}$, representing the log of the sale price of house $i$ in the neighborhood around CDBG project $k$ at time $t$. At some point in time, project $k$ is completed. We consider houses only in the vicinity of CDBG sites that are completed (1000 feet), and let the treatment group of houses be those that are close enough (i.e., closer than 500 feet) to be affected by the CDBG project. These houses are expected to be most affected by the CDBG project, while other houses in the same area, though exposed to similar local public goods, are not considered treated due to greater distance from the project.

The binary variable $Treat_{ik}$ denotes the treatment status of house $i$ related to CDBG project $k$, with $Treat_{ik} = 1$ for houses in the treatment group and 0 otherwise. The variable $Post_{ikt}$ indicates the timing of the sale, with $Post_{ikt} = 1$ for sales after the completion of CDBG project $k$. The model for observed log sale price is given by:

$$P_{ikt} = \mathbf{X}_{it}\beta + \phi_1 Treat_{ik} + \phi_2 Post_{ikt} + \phi_3 Treat_{ik} \times Post_{ikt} + \gamma_{ct} + \gamma_j + \gamma_t + u_{ikt}, \quad (1)$$

where $\mathbf{X}_{it}$ includes house characteristics. $\gamma_{ct}$ represents the municipality $c$ by time $t$ fixed effect, capturing common shocks at the city level, and $\gamma_j$ represents neighborhood heterogeneity. The coefficient $\phi_3$ is the expected log price change for the treated group minus that for the control group:

$$\begin{aligned} \phi_3 = & \left(E[P_{ik1}|Treat = 1] - E[P_{ik0}|Treat = 1]\right) \\ & - \left(E[P_{ik1}|Treat = 0] - E[P_{ik0}|Treat = 0]\right). \end{aligned} \quad (2)$$

The DID model's key assumption is common trends, suggesting that in the absence of CDBG projects, the expected house values for the treated group would have followed the same trend as those in the control group:

$$
\begin{aligned}
&(E[P_{ik1}|Treat = 1] - E[P_{ik0}|Treat = 1]) \\
&= (E[P_{ik1}|Treat = 0] - E[P_{ik0}|Treat = 0])\,.
\end{aligned}
\tag{3}
$$

Under this assumption, $\phi_3$ identifies the average treatment effect on the treated (ATT).

The second assumption of the DID model concerns the exogeneity of CDBG projects. Endogeneity may arise if decisions were deliberately made to direct CDBG investments towards areas in which home prices were already appreciating. This may lead to biased estimates, capturing the effect of investment choices rather than accurately reflecting the effect of the CDBG investments. Although we lack detailed data on CDBG application and selection processes, we conduct tests to assess whether treated and control homes differ significantly in observable house attributes, which could imply differential housing price trajectories due to local municipality decisions in selecting CDBG sites.

## 4.2 Dynamic Effects of CDBG Projects

To understand the dynamic effects of CDBG projects on housing prices, we employ an event-study type DID regression, following a strand of literature (Gilpin, Karger, and Nencka, Forthcoming):

$$
P_{ikt} = \mathbf{X}_{it}\beta + \sum_{d=-5, d\neq -1}^{d=5} \varphi_d Treat_{ikt} \times \mathbb{1}[t = d] + \gamma_{ct} + \gamma_j + \gamma_t + u_{ikt},
\tag{4}
$$

where $\mathbb{1}[t = d]$ is an indicator function for house $i$'s sale year $t$ being $d$ years from the completion of CDBG project $k$. The coefficients $\varphi_d$, $d = -5, \ldots, -2, 0, 1, \ldots, 5$, measure the log price differences between treated and control homes up to 5 years before and after completion, relative to the year prior to completion. To ensure that our estimates are not affected by potential spillovers from nearby CDBG projects or by overlap with subsequent CDBG projects, we include only the first transaction of homes that were sold more than once. This approach helps address concerns about heterogeneous treatment effects in DID models, as discussed in recent literature (Roth et al., 2023)

# 5 Results

## 5.1 The Impact of Public Investment on Housing Prices

Table 2 shows our main results of the DID estimation. The dependent variable is the inflation adjusted log sale price[2] across all columns, with increasingly added controls and fixed effects. Column (1) includes house attributes and the sale year fixed effect. In column (2), we introduce the city-by-year fixed effect to absorb city-specific shocks concurrent with CDBG completion. Column (3) adds the sale month fixed effect, accounting for more detailed common shocks and the seasonality of the housing market. Column (4), our preferred specification, includes the census block group fixed effect to capture neighborhood-level location heterogeneity.

While the key variable of interest is $Treat \times Post$, other coefficients merit some discussions. The coefficient of $Treat$ is 0.013 but statistically insignificant, suggesting that sale prices of homes in the treatment and control groups are comparable prior to CDBG project completion. Most of the results on the housing attributes are consistent with expectation. Lot size and building square footage have a positive statistically significant effect on sales prices. The number of half bathrooms also have a positive effect on sales prices. The results further reveal that the number of bedrooms does not have a positive correlation with housing prices. Interestingly, the findings also indicate that the number of full bathrooms is negatively associated with property values.

Our study joins the existing research that demonstrates the positive impacts of CDBG public investments on property values. In column (4), the estimate of $Treat \times Post$ is 6.6 percent, implying that within a 5-year window, houses near CDBG projects appreciate by 6.6 percent on average compared to those further away. This effect is statistically significant at the 5 percent level. This finding is consistent with the results of the study by Galster, Tatian, and Accordino (2006) who found that market values for single-family homes in census tracts receiving above

[2] All sale prices are adjusted using the U.S. housing CPI and in 2000 dollars.

threshold CDBG investments appreciated at a rate of 10.5 percent annually post intervention. Similarly, Pooley (2014) reported that census tracts receiving above sample median investments appreciated greater than census tract with less investment. In a more recent study, Overton and Stokan (2023) also found that CDBG investments capitalize in into property values, although the effect is different for residential and commercial properties.

## 5.2 Robustness

In Table 3, we present several robustness checks alongside our main results. Column (1) uses all sales data, rather than the 5-year window, to examine the long-term effect of public investments. This analysis shows that treated homes, on average, appreciate by 7 percent over the entire period. Columns (2) and (3) explore distributional effects by examining sales below and above the median price. The impact of public investment is similar across both groups, with homes below the median appreciating by 6.2 percent and those above the median by 5.8 percent.

## 5.3 The Dynamic Effects of Public Investment on Housing Prices

We employ Equation (4) to assess the dynamic effects of CDBG project completion on local housing prices. Figure 4 illustrates the empirical results using yearly data within a 5-year window of any CDBG project completion. This also serves as a test for the parallel trend assumption in our DID model. As can be seen from the figure, coefficients of $\varphi$ are small and not statistically significant up to 4 years prior to the completion of a CDBG project. The parallel trend prior to year zero also suggests there is no anticipation effect as people may think it is possible that home buyers could strategically bid up prices in areas that are under public investment. Our findings suggest this is not the case. However, we do see a quantitatively large effect following the completion, amounting to 2.6 percent appreciation of sale price, but not statistically significant. Starting from the second year after the completion, however, house values witness a dramatic increase of 9.8 percent relative to homes that were not treated by CDBG projects. This effect is persistent for three years and observes another appreciation in the fifth year.

While Figure 4 uses yearly data to study the medium-run effects of public investment, we could also gauge the short-run dynamics of such event on local property values. In Figure 5, we replace years in Equation (4) with quarters and focus on sales within the 12 quarter-window of CDBG projects. The results are consistent with what we find in Figure 4, where there exists seasonality effect across quarters, the overall pattern follows the main result as we do not find statistically significant effect immediately following the completion, but after 8 quarters.

# 6 Conclusion

This paper examines the impact of place-based investments on neighborhood quality. In particular, we examine whether public investments, backed by CDBG funds, affect the attractiveness of neighborhoods, as measured by property values. Using parcel level data from Cuyahoga County, Ohio, spanning the period 2000 to 2019, we employed a difference-in-differences estimation technique. This study makes a significant contribution by analyzing the dynamic timing effects of intervention, which is a technique rarely used in the literature. The three most widely used techniques to explore the relationship between area-based investments and property values are the Adjusted Interrupted Time Series (AITS), Regression Discontinuity (RD) and the DID approaches (Aarland, Osland, and Gjestland, 2017). We departed from prior studies by employing a dynamic effect DID model which allows us to disentangle the effect of the CBDG public improvements over an extended period – i.e., a one year to five-year period – following the intervention.

We performed robustness checks to ensure that the results are not spurious. Further, to address the potential problem of selection bias, we performed statistical tests to determine whether there were any significant differences between the homes located in the CDBG zone and those outside of it. The tests show that there were no significant differences between the two groups, therefore, selection bias is not likely occurring. The analysis demonstrates that CDBG public investments lead to capitalized benefits for homeowners. On average, homes that sold within 500 feet of completed CDBG public investments commanded a sales price that was seven percent higher than homes located further away from the site. Our event study analysis also reveals that this effect occurs approximately two years after the completion and persists over time. The findings of the study have important policy implications. By investing in community facilities, infrastructure, parks and recreation and other public improvements, local governments can increase the physical environment of neighborhoods, which in turn raises their appeal. Increased desirability leads to positive ripple effects. Private investors and homeowners join local governments by investing their own resources in the development of their communities (Walker et al., 2002). These direct and indirect neighborhood effects increase the demand for properties, subsequently leading to a rise in property values. Local governments can, therefore, intentionally invest CDBG funds in low-wealth neighborhoods with the aim of fostering wealth creation in those areas. Further, to ensure equitable distribution of property wealth across their jurisdictions, local governments should target diverse communities. By doing so, they can support wealth accumulation for all communities, rather perpetually generating wealth for the same areas.

In addition to its impact on individual wealth, CBDG investments also promote fiscal health within municipalities (Galster, Tatian, and Accordino, 2006). CDBG investments contribute to increased property values, resulting in higher property tax revenues collected for municipal governments. Increased government revenues enable local governments to invest more in education, infrastructure, and other essential services. Thus, local governments can strategically allocate CDBG resources not only to ensure increased property wealth for individuals but to also strengthen the overall economic well-being of their jurisdictions.

Although the current study provides valuable insights, it is not without limitations. The study only uses data from Cuyahoga County, Ohio and therefore may not be generalizable to other areas. In addition, the study does not comprehensively consider the heterogeneous effects of CDBG interventions. Future research should examine whether capitalization effects hold across neighborhoods with varying racial and ethnic composition. Additionally, exploring the impact on other neighborhood change variables such as racial and ethnic composition, employment, median household income and other demographic and socio-economic variables would yield meaningful discoveries. These inquiries can shed light on whether CDBG investments is an effective tool for fostering equitable development within municipalities.

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# 7 Figures

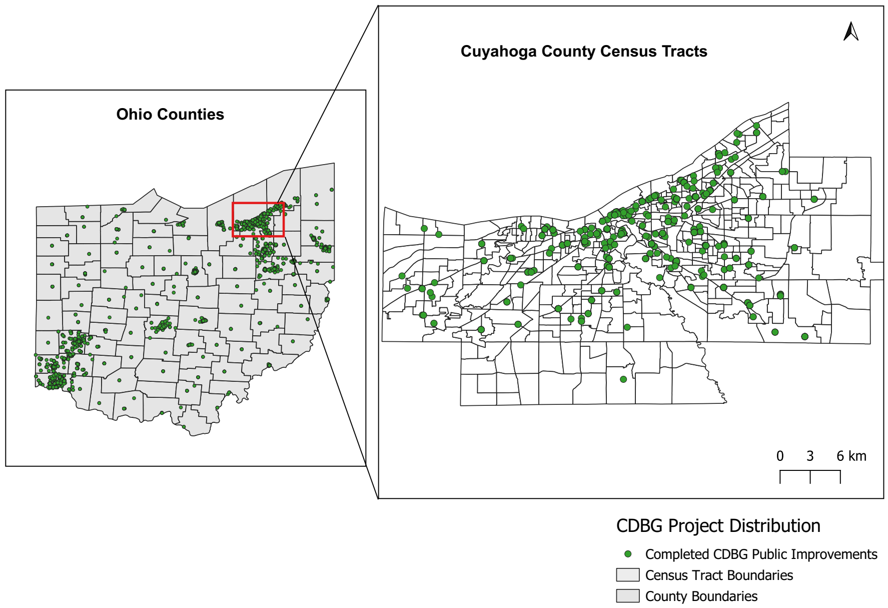


Figure 1: Map of CDBG

*Notes*: This figure plots the geographical distribution of CDBG projects over all years.

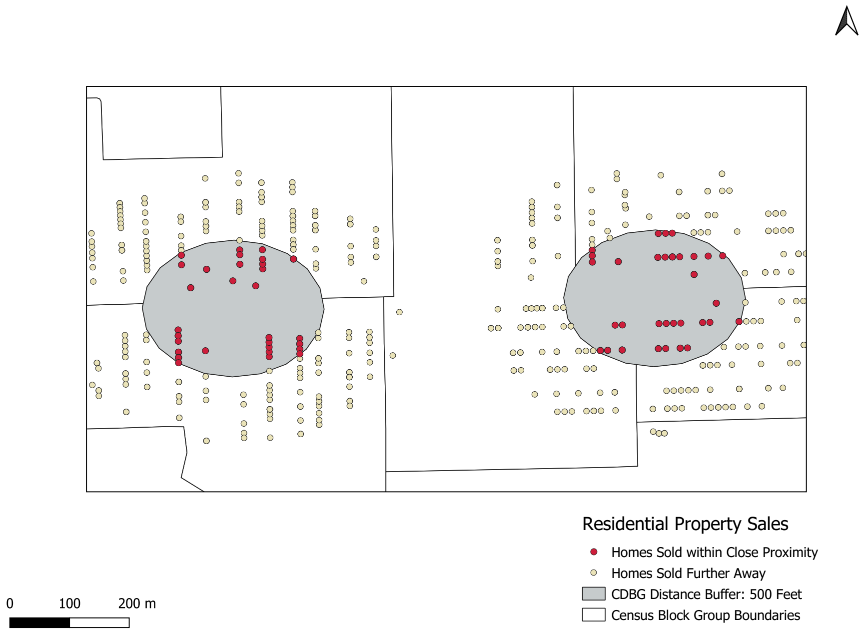


Figure 2: Illustration of Treatment and Control Selection

*Notes*: This figure provides the example of how we select treatment and control homes.

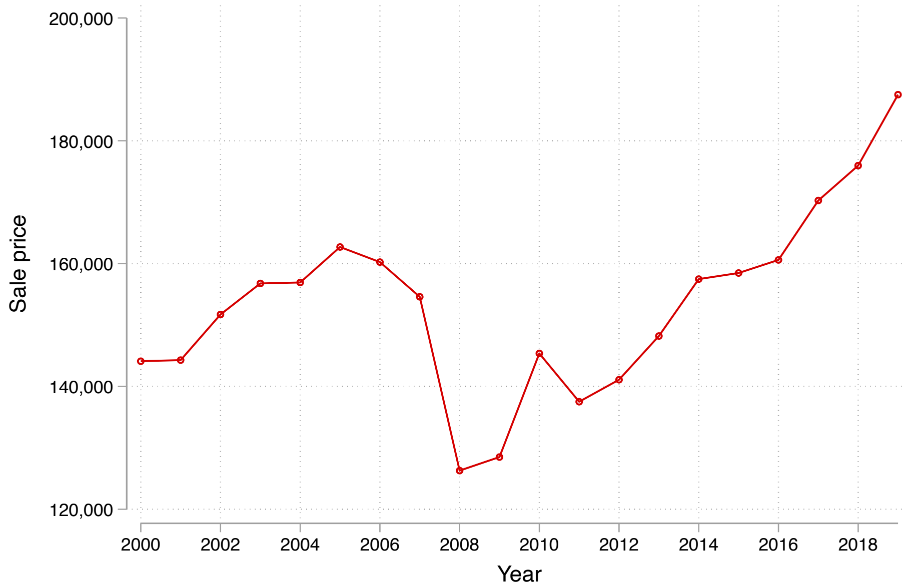


Figure 3: Trend of Housing Sales Price

*Notes*: This figure plots the average sale price by year.

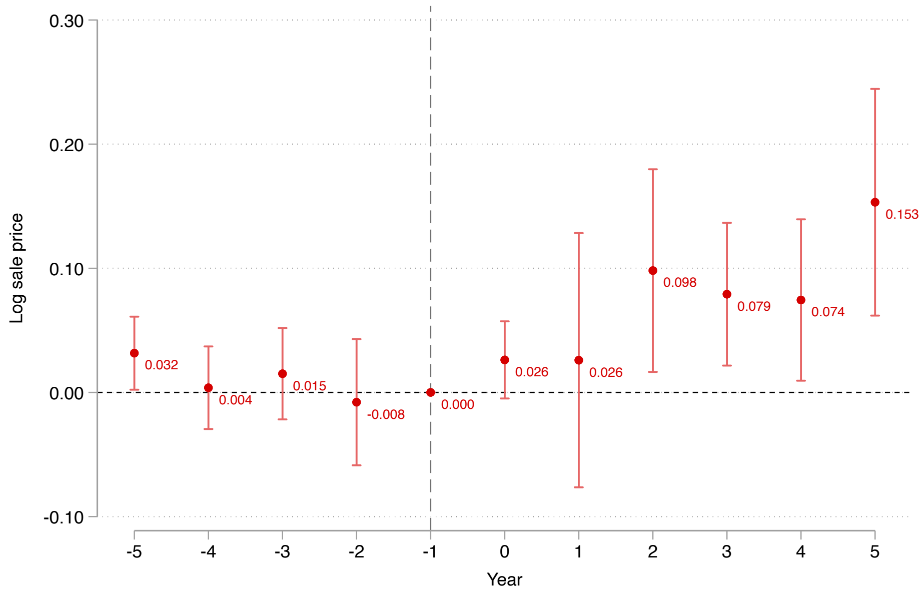


Figure 4: Dynamic Effects of the Completion of CDBG Projects

*Notes*: This figure plots the dynamic effects of the completion of a CDBG project on house values within 5 years.

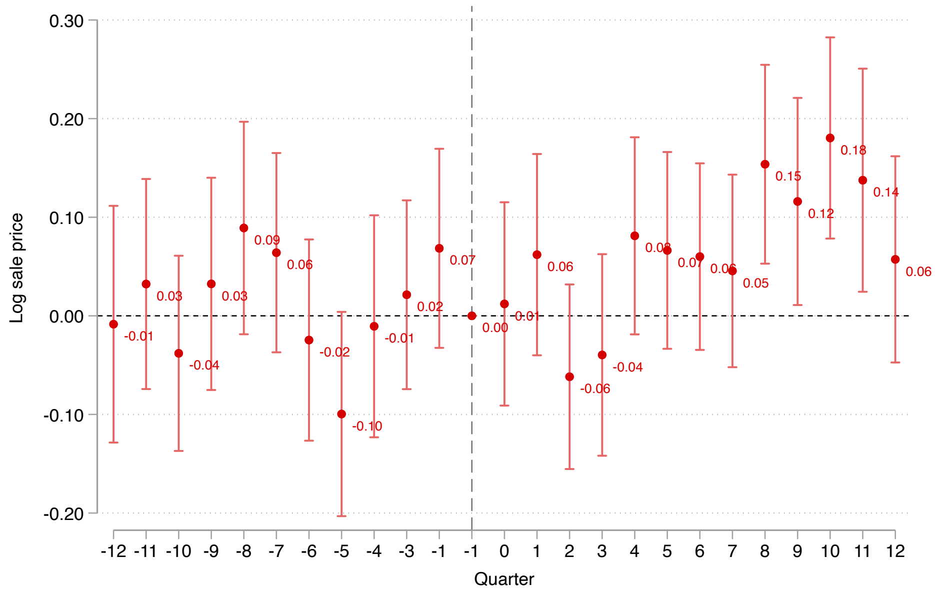


Figure 5: Short-Run Dynamic Effects of the Completion of CDBG Projects

*Notes*: This figure plots the dynamic effects of the completion of a CDBG project on house values within 12 quarters.

# 8 Tables

Table 1: Summary Statistics for Major House Attributes

| | (1)<br>Treat | (2)<br>Control | (3)<br>Difference |
|---|---|---|---|
| Price | 76,995.5 | 75,571.2 | 1,424.275 |
| | [57715.5] | [48101.9] | (4,535.373) |
| Log price | 10.96 | 10.92 | 0.041 |
| | [0.902] | [1.011] | (0.060) |
| Log lotsize | 8.543 | 8.565 | -0.023 |
| | [0.462] | [0.460] | (0.020) |
| Log square footage | 7.372 | 7.345 | 0.027 |
| | [0.317] | [0.320] | (0.016) |
| Age | 82.74 | 84.42 | -1.680 |
| | [24.96] | [25.13] | (1.871) |
| No. bedrooms | 3.536 | 3.449 | 0.087 |
| | [1.248] | [1.089] | (0.082) |
| No. bath | 1.439 | 1.391 | 0.048*** |
| | [0.594] | [0.558] | (0.016) |
| No. halfbath | 0.155 | 0.193 | -0.038 |
| | [0.368] | [0.418] | (0.043) |
| Wall fire | 0.344 | 0.352 | -0.008 |
| | [0.475] | [0.477] | (0.008) |
| Col style | 0.757 | 0.703 | 0.055** |
| | [0.429] | [0.457] | (0.024) |
| Observations | 7,831 | 34,405 | 42,236 |

*Notes*: This table reports the summary statistics for major house attributes for treated and control homes. Standard deviations are in brackets and standard errors are in parentheses. $^{*}$ $p < 0.10$, $^{**}$ $p < 0.05$, $^{***}$ $p < 0.01$

Table 2: Difference-in-Difference Results

| Dep Var: Log Price | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| $Treat$ | -0.003 | 0.052** | 0.024* | 0.013 |
| | (0.030) | (0.019) | (0.013) | (0.010) |
| $Post$ | -0.106* | -0.009** | -0.001 | -0.001 |
| | (0.058) | (0.004) | (0.006) | (0.004) |
| $Treat \times Post$ | 0.043 | 0.055* | 0.069** | 0.066** |
| | (0.035) | (0.031) | (0.029) | (0.031) |
| Log lot size | 0.301*** | 0.205*** | 0.195*** | 0.192*** |
| | (0.052) | (0.058) | (0.050) | (0.041) |
| Log square footage | 0.780*** | 0.464*** | 0.438*** | 0.428*** |
| | (0.177) | (0.034) | (0.022) | (0.022) |
| Age | -0.011*** | -0.012*** | -0.012*** | -0.012*** |
| | (0.004) | (0.001) | (0.001) | (0.001) |
| Age square | 0.000 | 0.000 | 0.000 | 0.000 |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| No. bedroom | -0.075*** | 0.002 | -0.001 | -0.001 |
| | (0.014) | (0.009) | (0.011) | (0.009) |
| No. bath | -0.072 | -0.043 | -0.037 | -0.041* |
| | (0.088) | (0.029) | (0.025) | (0.022) |
| No. halfbath | 0.364*** | 0.104* | 0.105*** | 0.097*** |
| | (0.066) | (0.053) | (0.026) | (0.021) |
| Wall fire | -0.062 | -0.045 | -0.067 | -0.064 |
| | (0.053) | (0.055) | (0.054) | (0.052) |
| Col style | -0.113 | 0.004 | 0.015 | 0.024 |
| | (0.104) | (0.054) | (0.054) | (0.060) |
| Year Fixed Effect | ✓ | | | |
| City-by-year Fixed Effect | | ✓ | ✓ | ✓ |
| Month Fixed Effect | | | ✓ | ✓ |
| Block Group Fixed Effect | | | | ✓ |
| Observations | 35,353 | 35,328 | 35,328 | 35,328 |
| $R^2$ | 0.319 | 0.572 | 0.613 | 0.617 |

*Notes*: This table reports the results of stacked difference-in-differences estimation. Robust standard errors are clustered at the municipality level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Robustness Checks

| Dep Var: Log Price | (1)<br>All Sales | (2)<br>Below Median | (3)<br>Above Median |
|---|---|---|---|
| $Treat$ | 0.038*** | 0.017 | 0.019*** |
| | (0.011) | (0.025) | (0.005) |
| $Post$ | -0.020** | -0.013 | 0.007* |
| | (0.007) | (0.008) | (0.004) |
| $Treat \times Post$ | 0.070** | 0.062*** | 0.058*** |
| | (0.033) | (0.015) | (0.017) |
| Observations | 71,319 | 17,376 | 17,567 |
| $R^2$ | 0.635 | 0.570 | 0.718 |

*Notes*: This table reports the robustness checks results. The dependent variable is log sale price. Column (1) does not restrict sales to be within 5 years of the completion of CDBG projects. Column (2) uses homes whose sale prices are below the median and column (3) uses homes whose sale prices are above median. All specifications control for the full set of controls in column (4) Table 2 including house characteristics, city-by-year fixed effect, month fixed effect, and block group fixed effect. Robust standard errors are clustered at the municipality level. $^{*}$ $p < 0.10$, $^{**}$ $p < 0.05$, $^{***}$ $p < 0.01$