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Essays on Urban Disinvestment & Neighborhood Displacement

Austin Harrison

ABSTRACT

ESSAYS ON URBAN DISINVESTMENT & NEIGHBORHOOD DISPLACEMENT

BY

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This dissertation seeks to expand the scholarly conversation on neighborhood change and neighborhood displacement to include how the processes of disinvestment and decline are associated with neighborhood displacement. This three-essay dissertation intends to add necessary nuance to the neighborhood change discussion by further conceptualizing "disinvestment-induced-displacement" (DID), determining the specific processes that lead to DID, and mapping the extent to which DID occurred during the housing market's recovery from the subprime mortgage crisis.

In the first essay, I conduct a critical systematic review of recent neighborhood displacement research to better quantify the trajectory of what we know about how and why households leave neighborhoods. More specifically, I ground the analysis through the lens of disinvestment and abandonment to discern the extent to which processes of abandonment- or disinvestment-induced displacement are present in the existing literature. This research lays the foundation for a more nuanced discussion of the complex ways neighborhoods can change. Hopefully, this piece can assist in framing a meaningful policy discussion around ways to plan for the intentional and equitable redevelopment of systemically disinvested communities.

In recent years much has been written about displacement, but almost exclusively in the context of expected or potential gentrification. The second essay is an exploratory national study that seeks to further the problematization of "gentrification-centric" displacement. The study does this by quantitatively identifying specific disinvestment factors associated with a household's decision to leave a neighborhood. The Panel Study of Income Dynamics (PSID) dataset will be used to construct the dependent variable in the multi-variate analysis. Neighborhood displacement will be measured by a household's decision to leave the neighborhood (census tract) during the recovery period from the global subprime mortgage crisis (2013 – 2017). A linear probability model will be used in this essay in hopes of understanding whether factors like school closures, hypervacancy, and the like are associated with household exits. me

The third and final essay will take the specific disinvestment variables at various geographic levels (household, neighborhood, metro region) that were significantly associated with household exits in Essay 2 and use these variables to create a Disinvestment-Induced-Displacement (DID) index based on a methodology adapted from the Townsend Deprivation Index (Townsend, 1987). Additionally, the essay will build a working conceptualization of DID, building on previous uses of the term, situating it within the broader spectrum of neighborhood change (Seymour & Akers, 2022). The new conceptualization and measure will help frame a spatial analysis of DID, mapping the multi-variate measure results to the neighborhood level. The spatial analysis will look at the extent of DID in the Top 200 metros in the U.S. and zoom into both large and mid-sized metros to see where DID is spatially concentrated within the metro area. This essay begins by estimating the extent to which DID impacted urban areas during the

housing market recovery, and then ties together regional economic dynamics and their neighborhood change implications.

There is very little known about how disinvestment as a process interacts with or contributes to other neighborhood change processes such as displacement. This dissertation is a start, but much more research is needed on the topic.

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BY
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ACCEPTANCE

This dissertation was prepared under the direction of the candidate's Dissertation Committee. It has been approved and accepted by all members of that committee, and it has been accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Urban Studies in the Andrew Young School of Policy Studies of Georgia State University.

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DEDICATION

To Johanna, my best friend, life partner, and eternal teammate. This one's for you.

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As a working-class kid from Winder, Georgia the academy always felt out of my reach. So, I'd be remised if I didn't briefly thank and acknowledge everyone that convinced me it was possible and supported me in this journey. First and foremost, Dr. Dan Immergluck, one of the most honest and just individuals I've ever had the pleasure of working with. He put the program on my radar years ago. His thoughtfulness, advocacy, and seemingly endless wisdom along the way played a pivotal role in getting to this point. The English language is not holding up well here, so I will just say thanks for everything!

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Last but not least to the various teachers, professors, and mentors along the way, far too many to name. I would like to shout out one in particular. Dr. John T. Scott was an undergrad history professor of mine who was the first person to suggest a Ph.D. It was not something I considered a possibility before then, so thank you, Dr. Scott.

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INTRODUCTION

Urban neighborhoods are many things to many people, but static is generally not one of them. Change at the neighborhood or block level is almost as old a phenomenon as the neighborhood itself. Some of the earliest urban researchers discussed how and why neighborhood change leads to specific groups of people moving into or out of one community (Du Bois, 1899; Burgess, 1928). As urban research grew, the neighborhood change literature produced two dichotomous explanations for ways change led to household exits, especially in urban areas. The first, neighborhood life cycle theory, or inevitable decline, conceptualized an unavoidable demise for specific neighborhoods; therefore, enhancing or expediting the departures would eventually help the neighborhood when it was its time to "come back to life" (Metzger, 2000). The second one, gentrification, now makes up one of the most discussed urban topics of our time (Glass, 1964; Freeman, 2011; Hwang & Lin, 2016; Carlson, 2020). This dichotomy of inevitable decline or gentrification leaves little to no space for necessary discussions around strategies to reinvest in systemically disinvested communities consciously and intentionally. But where does this dichotomy originate from?

Issues of displacement and decline tend to manifest spatially, with their shared importance drawn from ideas and theories of spatial justice in the context of the place-based redevelopment as a distributive justice mechanism (Soja, 2010; Fainstein, 2011). In other words, place matters a lot, and the systemic and long-running spatial injustices that are a byproduct of uneven development and residential segregation define urban America (Krysan & Crowder, 2017; Smith, 2010). Such spatial inequalities undergird quality of life challenges ranging from housing and job access to health outcomes and many other issues in between (Galster & Sharkey, 2017).

Acknowledging the importance of space and place means recognizing the importance of households having the option to remain in a particular area, especially for householders most vulnerable to the winds of neighborhood change, lower-income residents. While I will explain what "low-to-middle income" (LMI) means when defining key terms, these tend to be essentially the same households and individuals susceptible to displacement by gentrification pressures. LMI households are also the core constituencies for many community development interventions targeted by affordable housing, social service, and other place-based neighborhood programs. For those leading these interventions, there is a conceptual polarization regarding the future of specific places with high amounts of low-income residents: it will gentrify, or it will "die." Often this goes unsaid in a discussion of neighborhood change, but the "gentrify or die" proposition needs to be centered.

The "gentrify or die" proposition is a normative thought process standard in discussions of neighborhood change processes. This proposition situates two polar destinies for most urban neighborhoods. The area in question cannot experience a slow, consistent growth that can be sustained over long periods of time and is ideal for wealth building. This more sustainable and healthy growth pattern has been the common trend observed in predominantly white housing sub-markets for decades now. Instead, "gentrify or die" creates a boom or bust mentality that leaves little space for discussions of intentional, community-driven development.

There are several reasons for this reality, many of which will be discussed later in the dissertation, but the role of race in this process of segregation and uneven development cannot be overstated (Krysan & Crowder, 2017; Smith, 2010). Within this conceptual framework of racialized uneven development, the "gentrify or die" proposition springs from and

simultaneously operates within this structurally racially capitalist development framework (Dantzler, 2021a)

The low-income residents residing in these working-class communities are often the last actors to invoke or even acknowledge this axiom, primarily because of their vantage point and the demands of their daily lives (Rice et al., 2016). However, those community development or neighborhood change actors who are "seeing like a state" or those coming to terms with their understanding of a place through maps, plans, and market analyses, are most likely to adopt or invoke the "gentrify or die" frame of mind (Scott, 2008). It includes but is not limited to urban planners, community developers, real-estate developers, local government officials, and other community-based entities understanding how an area changes in a more top-down fashion.

Importance & Purpose

In my time as a community development practitioner working in urban neighborhoods, often in a legacy city or shrinking city context, this conceptual polarization was palpable in many of the communities in which I worked. The "gentrify or die" way of thinking tends to show up in contested public meetings or discussions of a neighborhood's future, when oftentimes development or intervention details have already been determined.

It should go without saying, these power distribution concerns are valid and rooted in decades of racially imbalanced political economies and deserve to be treated as such. However, upon diving deeper into the research, I noticed that neighborhood change's public discourse also foregrounds gentrification. In doing so, the sensationalization of the topic casts a long shadow that makes it difficult to discuss the nuances of change at the neighborhood level. Academics broadly researching neighborhood change in rapidly appreciating coastal markets are dominating

the dialogue, to the point where legacy cities such as Cleveland, St. Louis, Birmingham, and Memphis struggled to create space for their market realities in urban neighborhoods more threatened by erasure by decline, than erasure by hyper-appreciation (Freeman, 2005; Hyra, 2015; Mallach, 2020).

Responding to this dangerous oversimplification of neighborhood trajectories is where this dissertation seeks to carve out a space. I hope to expand the scholarly conversation on neighborhood change and neighborhood displacement to include how the process of disinvestment can lead to neighborhood displacement. I also seek to interrogate whether the disinvestment and displacement connection must be considered inevitable or considered a conscious and preventable phenomenon by identifying specific disinvestment actions, processes, and conditions that contribute to household exits. Previous research on displacement and neighborhood change is contextualized only in quickly appreciating contexts, where little disinvestment is occurring. As a result, there are volumes of evidence that suggests rapid, spatially concentrated appreciation can cause existing residents to exit their neighborhood to varying extents (Lee & Evans, 2020; Hwang & Lin, 2016; Ellen et al., 2019). On the flip side, there is far less research examining ways urban shrinkage or decline and the constituent neighborhood-level events and processes that follow contribute to neighborhood displacement (Marcuse, 1985; Tighe & Ganning, 2014). One notable exception that is similar in intent and motivation is some of William Julius Wilson's earlier work that focused on Black middle-class exits from declining urban neighborhoods (Wilson, 1981). By examining how intentional and conscious decisions by local actors, private and public, might drive household exits, this study will hopefully empower scholars, policymakers, and advocates to demystify the ways neighborhoods experience disinvestment-induced-displacement (DID).

Defining Key Terms

Before discussing the details of this project, it is necessary to define some critical foundational terms in the context of this project. The two foundational and sometimes complicated concepts that necessitate a detailed definition are 1) neighborhood displacement and 2) disinvestment. This project defines neighborhood displacement as the exiting of residents from a neighborhood due to direct or indirect forces, processes, events, or actions that heavily encourage or force their exit. This definition is like those used in some gentrification literature examining displacement and results in a similar outcome, a household leaving the neighborhood (Freeman, 2005; Lee & Evans, 2020). For this study, I will look at the exits of lower-income households (less than 100% of the area median income) from a specific neighborhood. The neighborhood will be the unit of analysis and operationalized by the census tract, an imperfect proxy for the neighborhood often used in the literature (Galster, 2019b).

Secondly, the definition of disinvestment also builds from existing literature. It is defined as a process, not an outcome, that often occurs within the context of urban shrinkage, depopulation, and abandonment where spatially concentrated deterioration disproportionately impacts specified geographies (Haase et al., 2014; Morckel, 2014). Moreover, in this project's conceptualization of disinvestment, the rate of the process can be sped up or slowed down based on intentional decisions made by state or market actors. Tangentially, Ruth Wilson Gilmore's (2008) idea of "organized abandonment" also plays into the conceptualization here. This concept foregrounds government action or deliberate inaction in intentionally stripping virtually all social infrastructure from a place. The result leaves law enforcement as one of the only responders left to address a community's challenges or needs. This project's broad conceptualization of disinvestment leaves room for ideas of "organized abandonment" or other state-centric concepts

that stress the intentionality and purpose behind disinvesting (Gilmore, 2008). Thinking of displacement as a process in this manner shifts the focus from *disinvested* spaces to "disinvesting" or "disinvestable[1]" places. One such example of a type of neighborhood with a higher propensity for the process of disinvestment (therefore displacement) to occur is middle-income neighborhoods (hereafter referred to as "middle neighborhoods"). These communities and their working-class or middle-class residents could be experiencing higher rates of neighborhood displacement than in areas that are already thoroughly disinvested and may have lost a substantial population in prior episodes of disinvestment.

In addition to conceptualizing neighborhood displacement and disinvestment for this project, the term this research will introduce, disinvestment-induced-displacement, also deserves its own conceptualization given it is the heart of the project. Furthermore, the term DID has not been explicitly conceptualized before, but it is similar to other terms in the literature. DID is not a new phenomenon, with the idea first featured in Peter Marcuse's (1986) piece on neighborhood change in New York City. At the time, Marcuse did not use this precise terminology but described in detail how abandonment and decline contribute to neighborhood displacement and in recent scholarship, DID itself is used to elaborate on this process (Chapple & Zuk, 2015; Sims, 2015).

In thinking of what this project means when it says "disinvestment-induced-displacement," it could help contrast it with other, more familiar displacement generators. One example of such is state-sponsored displacement, where a significant redevelopment project, such as urban renewal or HOPE VI project, displaces an entire complex or neighborhood through the physical or forceful destruction of existing residential and commercial structures to make

[1] In the context of this proposal, II use this term to define neighborhoods prone to the impacts of disinvestment and decline. Middle-class neighborhoods for example would categorize as "disinvestable"

way for an "upgraded" built environment (Goetz, 2010). Of course, the line between state-sponsored displacement and the short-term and long-term policy implications of more indirect state actions is a blurry one. The state should not be absolved from the many other ways their actions impact questions of decline or appreciation, but state-sponsored displacement characterizes more direct actions where the state is the developer or primary manager of the project. Residents responding to actions of the state or other policy implications is not state-sponsored displacement for the purposes of this research.

In contrast to state-sponsored displacement, the most often studied driver of neighborhood-level displacement is market appreciation and gentrification pressures, though the extent to which those forces lead to displacement remains contested and likely dependent on the precise context and degree of gentrification pressures unclear (Hwang, 2016).

Instead of a state-sponsored development or concentration market growth, disinvestment-induced-displacement, as its name alludes, situates the processes of abandonment or neglect as the critical driver of displacement. Here, the primary mode of displacement looks much different than gentrification or state-sponsored and could conceptually include school closures, physical disorder, housing instability, increased criminal activity, and much more. A vital piece of the proposal is a fuller conceptualization of the term and the associated processes that operationalize disinvestment-induced-displacement.

The Rest of the Dissertation

This dissertation consists of three core chapters, along with this introduction and conclusion that ties them together.

The first core essay further problematizes the how, where, and why of normative neighborhood displacement research. This is done through a systematic review of the literature that includes a systematic review that scores relevant displacement research from both within and out of the academy. Moreover, this essay also looks at where single-study neighborhood displacement studies tend to occur and spells out the specific indicators used to measure and discuss characteristics associated with neighborhood displacement. The expectation here is to find further evidence for the ways in which the "gentrify or die" paradigm is perpetuated and sustained in the recent neighborhood change discourse. The first essay will add to the case for further expanding notions of neighborhood displacement to include disinvesting or declining forces as well.

Building on that case, the second essay will seek to identify specific disinvestment factors that may be most responsible for encouraging or forcing a family to decide to leave a neighborhood. Factors in the study include prior school closures, prior hypervacancy, prior residential investment (or lack thereof), etc. These factors are included as primary variables in a linear probability model, with the dependent variable (DV) being whether a family left a neighborhood (census tract) in the last year. The DV comes from the Panel Study of Income Dynamics and has a census tract of residence for 2015 and 2017, households with different tracts will constitute a neighborhood exit.

The factors that come in as significantly associated with displacement in the second essay's analysis will form the foundation of a DID index. Moreover, DID itself will be further conceptualized, and a conceptual model for DID will accompany the index. With the concept better defined and a working measure for DID, the study can estimate the spatial extent of DID in the top 200 metros across the country. Certain metros with a high proportion of DID will be

further investigated to look at some of the related conditions present in neighborhoods (tracts) with a high DID index score.

The three essays together constitute a first step, one that accompanies other recent research on similar concepts to DID, and together these studies can disrupt the normative "gentrify or die" paradigm and open a new discussion that moves toward more of a spectrum of neighborhood displacement, as opposed to the essential binary that currently seems to define the neighborhood change discourse. Therefore, the space for intentional and community development will become easier for community organizers, planners, and policymakers to carve out in future neighborhood change interventions.

ESSAY 1 - LOOKING AT THE OTHER SIDE OF THE COIN: A CRITICAL ANALYSIS OF NEIGHBORHOOD DISPLACEMENT RESEARCH IN THE CONTEXT OF DISINVESTMENT

Over the last couple of decades, there has been little focus on other types of neighborhood change, as the gentrification conversation consumes so much space and attention in urban research. This paper seeks to critically analyze the ways contemporary urban research conceptualizes and subsequently operationalizes neighborhood displacement. This paper will further problematize the existing research on neighborhood displacement by showcasing the extent to which the current literature virtually ignores ways disinvestment as a process is associated with displacement. Before this study can adequately address the shortcomings of existing displacement research, a rigorous and critical analysis of the literature is needed.

Purpose and Research Questions

Besides setting the stage for the rest of the dissertation, this paper has three additional purposes. One is to highlight the gap in the displacement literature and the dangerous "gentrify or die" axiom that develops from it. The second is to wrestle with the implications of disinvestment's absence in how I conceptualize neighborhood displacement. If the term displacement is rarely used outside of the gentrification lens, how does that impact how the urban research field understands neighborhood displacement as a process? The third purpose is to answer a call from recent research to examine displacement in the context of more heterogeneous market conditions (Lee & Evans, 2020).

The specific research questions guiding this paper are: to what extent are disinvestment or decline processes and events discussed in neighborhood displacement research? If they are

not, why not? Moreover, what does the potential absence of disinvestment, theoretically and empirically, mean for more critical questions regarding causes or contributions to household exits from the most "disinvestable" neighborhoods, especially Black urban middle areas (Mallach, 2020)? These research questions above and the other intellectual curiosities driving this research come from the neighborhood change literature that points to the deleterious effects of disinvestment and its constituent events and characteristics, such as hyper-vacancy, school closure, and previous population decline (Galster, 2019a; Tighe & Ryberg-Webster, 2019). In short, what we know about disinvestment is driving this study's emphasis on the relationship between it and displacement.

The remainder of the paper is organized as follows. First, the three foundational concepts for this systematic literature review and systematic review will be defined. Next, previous neighborhood displacement research in both the academic and grey bodies of literature will be discussed. Thirdly, the methods for the systematic review are detailed, including the search strategy, scoring criteria, and the thought process behind other methods key to this systematic review of previous neighborhood displacement research. Fourth, the results of the systematic review are discussed, including implications for the relationship between urban disinvestment and neighborhood displacement. Finally, the limitations of the study are set out alongside future key future research questions prompted by this systematic review.

In a systematic review of the literature regarding a topic such as this, it is necessary to define some critical foundational terms in the context of this project. The three foundational and sometimes complicated concepts that necessitate a detailed definition are 1) neighborhood displacement, 2) disinvestment, and 3) the "gentrify or die" proposition.

This project defines neighborhood displacement as the exiting of residents from a neighborhood due to direct or indirect forces, processes, events, or actions that heavily encourage or force their exit. This definition is like those used in some gentrification literature examining displacement and results in a similar outcome, a household leaving the neighborhood (Freeman, 2005; Lee & Evans, 2020). It is important, however, to distinguish this definition of "neighborhood displacement" from other types of displacement discussed in the literature. This project acknowledges five types of displacement based on previous research.

1) Physical Displacement is the forced move following the demolition and/or planned redevelopment of a specific site or community (Lopez & Greenlee, 2016).
2) Direct Displacement is the type of displacement this proposal centers on and is a direct or indirectly resident exit from the unit or neighborhood (Lee & Evans, 2020).
3) Cultural Displacement is a less tangible form of displacement that describes the way a change in the neighborhood impacts cultural assets, commercial development or displacement, or power to define the cultural elements of a specific community (Zukin, 1987).
4) Political Displacement is the loss of power at the neighborhood level where in-movers take control of neighborhood associations and other civic associations from long-term residents (Hyra, 2015).
5) Exclusionary displacement is when rents or prices go up to the point where it prevents working-class in-moves (Sims & Sarmiento, 2019).

Secondly, the definition of disinvestment also builds from existing literature. It is defined as a process, not an outcome, that often occurs within the context of urban shrinkage, depopulation, and abandonment where spatially concentrated deterioration disproportionately impacts specified

geographies (Haase et al., 2014; Morckel, 2014). Moreover, in this project's conceptualization of disinvestment, the rate of the process can be sped up or slowed down based on intentional decisions made by state or market actors. Applying this concept often occurs through disinvestment indicators that include common pieces of information found in urban disinvestment literature, such as vacancy, population loss, school quality, etc.

Tangentially, Ruth Wilson Gilmore's (2008) idea of "organized abandonment" also plays into the conceptualization here. This concept foregrounds government action or deliberate inaction in intentionally stripping virtually all social infrastructure from a place. The result leaves law enforcement as one of the only responders left to address a community's challenges or needs. This project's broad conceptualization of disinvestment leaves room for ideas of "organized abandonment" or other state-centric concepts that stress the intentionality and purpose behind disinvesting (Gilmore, 2008). Thinking of displacement as a process in this manner shifts the focus from *disinvested* spaces to "disinvesting" or "disinvestable" places.[2] One such example of a type of neighborhood with a higher propensity for the process of disinvestment (therefore displacement) to occur is middle-income neighborhoods (hereafter referred to as "middle neighborhoods"). These communities and their working-class or middle-class residents could be experiencing higher rates of neighborhood displacement than in areas that are already thoroughly disinvested and may have lost a substantial population in prior episodes of disinvestment.

Thirdly, the "gentrify or die" proposition is a thought process that is common in discussions of neighborhood change. This proposition situates two polar destinies for most urban neighborhoods. Either the area's fortunes turn around, and it sees concentrated hyper-appreciation akin to gentrification. Or the neighborhood's slow and "natural" demise will run its

[2] In the context of this proposal, we use this term to define neighborhoods prone to the impacts of disinvestment and decline. Middle-class neighborhoods for example would categorize as "disinvestable".

course, and the neighborhood will "die." Decades of underinvestment and disinvestment have made it difficult for urban areas with depressed values to see steady growth as seen in more affluent, often whiter communities (Smith, 2010). There are several reasons for this reality, but the role of race in this process of segregation and uneven development cannot be overstated (Krysan & Crowder, 2017; Smith, 2010). Within this conceptual framework of racialized uneven development, the "gentrify or die" proposition springs from and simultaneously operates within. Further discussion and definition of this concept will occur when key terms are defined.

The low-income residents residing in these communities are often the last actors to invoke or even acknowledge this axiom, primarily because of their vantage point and the demands of their daily lives. However, community development or neighborhood change actors who are "seeing like a state" or those coming to terms with their understanding of a place through maps, plans, and market analyses, are most likely to adopt or invoke the "gentrify or die" frame of mind (Scott, 2008). It includes but is not limited to urban planners, community developers, real-estate developers, local government officials, and other community-based entities understanding how an area changes in a more top-down fashion.

Neighborhood Displacement Background

Much of the "gentrify or die" axiom is perpetuated not just by the way the term is used but also by the way the term is defined and conceptualized, especially when considering the causes and effects of this process. Though often considered a difficult to define concept, Ruth Glass first defined and conceptualized gentrification as the displacement of the working class in favor of the "gentry" or the social class in London directly below the nobility (1964).

In the decades following Glass, gentrification received little attention in the American context until the late - 1980s and 1990s, when areas of previously concentrated poverty in certain large U.S. cities experienced targeted reinvestment leading to the advent of different iterations of gentrification or neighborhood displacement theory. This theoretical evolution introduces a variety of racial, social, and economic components of the gentrification processes that would result in a variety of forms of displacement, either physical or perceived (Zukin, 1987; Smith, 1996). Furthermore, during these times, key gentrification theorists also drew direct lines between gentrification and displacement theory and previous human ecological concepts of succession and invasion, terms used to describe similar phenomena, especially during the early 20th century (Freeman & Braconi, 2004). As a result of these conceptual ties and changing public opinion, gentrification increasingly became a concept with negative associations, therefore leading to urban thinkers theorizing solutions or prescriptions to the gentrification problem (Smith, 1996; Brown-Saracino, 2010).

As for evidence of displacement at the neighborhood level, there is a large and ever-growing body of work coming predominantly from hot-market coastal cities such as New York City, Washington DC, and Los Angeles. You can divide this evidence into two camps: causes and outcomes. As for causes of gentrification, some cited decreasing crime rates, job access, and growing interests in living closer to where individuals work, post-recession housing finance practices, and location of amenities near key commercial areas or city centers (Ellen et al., 2019; Freeman, 2011; Hyra, 2012; Hwang & Lin, 2016). As for outcomes, most evidence has focused on less tangible forms of displacement, such as cultural sense of place and the imbalance of power and agency during and after the gentrification process (Hyra, 2015). As the gentrification literature has evolved, one key effect has received growing evidence: displacement. There is a

growing body of evidence discussing the physical displacement of lower-income individuals and households in favor of more affluent and often whiter individuals or households (Hwang & Lin, 2016; Fullilove, 2016; Pries, 2020).

As the evidence of displacement has grown, many think tanks, non-profit research groups, or policy advocacy shops have focused on measuring, mapping, or tracking displacement in a particular city or set of cities. The way displacement is measured and the way concepts like "gentrification pressures" is operationalized are key to understanding from a background and context perspective prior to digging into the systematic review.

Most of them use a similar set of variables to categorize neighborhoods as "at risk of displacement" or not. Freeman's (2004; 2005) work was very influential not just in the scholarly conceptualizations of gentrification and displacement but also in the non-scholarly analysis. As a result, the variables used in grey research track well with Freeman's variables of median home value and educational attainment. In the research conducted in many cities, researchers have brought hyper-local contexts to bear that slightly changed the way displacement was measured or was occurring. Still, none have used neighborhood-level data to track household exits in large part due to the lack of publicly available neighborhood-level mobility data. Instead, most have focused on related processes of cultural or political displacement or looked broadly at how the demographic composition of the residents has changed over time (Smith et al., 2016; Duda, 2018; Smith et al., 2019; Urban Displacement Project, 2019; Pettit et al., 2019).

All of the studies here were conducted in Chicago by team members associated with the Institute for Housing Studies, an applied housing research group at DePaul University. This research took place over three years and is constructed by various deliverables that show how a city or local researchers grapple with the multiple aspects of displacement. For example, the

2016 study and the genesis for the multi-year commitment to studying displacement was the construction of the 606, an elevated rails-to-trails project characteristic of state-sponsored displacement pressure generators (Smith et al., 2016; Immergluck, 2009). From that point on, the market pressures and sub-market dynamics resulting from the impact of the 606 were more of the focus of the research and in no cases were actual household exits tracked or measured directly.

Another study was a multi-city project led by the Urban Institute, working alongside local research partners based at applied research centers in the cities of Buffalo, Minneapolis, Detroit, Milwaukee, and Phoenix. This approach is novel because it includes cities commonly included in the discussion of appreciating markets (i.e., Phoenix and Minneapolis), with cities typically lumped in with depreciating or declining markets (i.e., Detroit and Buffalo). In each city, they focused on a specific neighborhood or region of neighborhoods experiencing either an exogenous shock, like the 606 in Chicago, or market forces leading to neighborhood displacement pressures. Here racial and ethnic composition was the only traditional displacement variable leveraged, opting for a focus on building characteristics or rentership instead of home values or household income.

Similar research has also been carried out by think tanks or the like on that national scale. In most cases, it is looking at the outcome of displacement versus the process. In general, these outcomes-focused, grey displacement research conducted at the national scale tends to provide a wider variety and is more likely to focus on the individual housing units. For example, Richardson et al. (2020), instead of looking at changing resident characteristics such as poverty rate or household income, sought to track instances of residential displacement occurring through either the foreclosure process or eviction process. Opting to focus on the entire country, where

data permitted, and diving deeper into select cities (Robustelli et al., 2020), this study did not find whether that individual instance of residential displacement ultimately resulted in the household leaving the neighborhood, which I refer to throughout this study as "resident exit."

One outlier to these non-peer-reviewed displacement studies conducted at the national scale is the work of Orfield and Stancil (2019), and their research center at the University of Minnesota's Law School produced a report focused on neighborhood change as a process, but as you can tell in Table 1, they still are not measuring household exits or a comparable piece of tangible evidence measuring neighborhood displacement. In short, Orfield and Stancil group census tracts into a typology of four categories: growth, low-income concentration, low-income displacement, and abandonment. Overall, they found that no metro in America at the time of the study had more tracts experiencing "growth" or "Low-income displacement" than those experiencing "low-income concentration" or "abandonment," a finding that supports a focus on neighborhood change research that foregrounds decline, disinvestment, stagnant concentrated poverty, and the like (Orfield & Stancil, 2019).

A synthesis of scholarly displacement measures furthers the problematization and showcases that most estimates are heavily influenced by the market context, even in national studies (Hwang & Lin, 2016). Therefore, the neighborhood characterizations from models of neighborhood displacement can be misleading and rarely factor in the impacts and processes of disinvestment as additional "displacement pressures." Only two of the seven scholarly pieces measured resident exit at the neighborhood level. In most cases, much like the Preis et al. (2019) piece mentioned earlier, the focus is on neighborhood change dynamics, typologies, or the condition of the area since it is so challenging to track granular mobility. As a result, studies that track resident exit at the neighborhood level are rare due to the lack of accessible data. The two

studies that follow resident exit do so using difficult-to-access datasets such as the Panel Study of Income Dynamics or Census micro-data. The former will be used in this study (Freeman, 2005; Lee & Evans, 2020).

The neighborhood change literature still provides limited information about what influences a household's decision to move out of a neighborhood. The grey literature and the academic literature center on discussions of displacement "pressures" or market dynamics instead of measuring physical removal from the unit or the neighborhood. The gap in the literature is already clear but acting as though displacement and disinvestment have never existed together would be misleading and inaccurate.

Displacement & Disinvestment Overlaps

There is little existing empirical evidence connecting processes of abandonment or decline to displacement. The same paper (Marcuse, 1985) that contributed to significant leaps in defining and conceptualizing displacement by gentrification also described the various displacement pressures connected to depreciation as well, at varying scales using late 70s, early 80s New York City as his case study to observe this dichotomy. In recent years, some think tanks, such as the National Community Reinvestment Coalition, have entered the discussion of disinvestment and neighborhood change but mainly from the context of a singular policy solution, Opportunity Zones, for example (Richardson et al., 2020).

Outside of the Marcuse piece and some grey literature, two other studies focusing on St. Louis have attempted to apply relevant theory to processes of urban shrinkage or decline. One study operationalized Marcuse's concept of uneven development in the context of St. Louis (Tighe & Ganning, 2014). The other focused more broadly on "gentrification" in post-industrial

cities, comparing St. Louis to Dortmund, Germany (Swanstrom & Ploger. 2020). Neither of these studies empirically connects details of disinvestment and how it contributes to household exits. One recent book started connecting these dots but not explicitly. Through detailing his observations of the "Divided City," Mallach (2018a) provides more evidence for uneven development while hinting at the displacement implications of this trend. Still, Mallach's piece and others fail to come right out and make the connection (Immergluck et al., 2018).

Systematic Review Methods

This study will seek to analyze neighborhood displacement research through the disinvestment lens to understand the extent to which neighborhood displacement discussions involve disinvestment processes. For this objective, the project employs systematic review methods like other systematic reviews of planning and urban literature (Schnacke-Mahl et al., 2020; Morris et al., 2021).

More specifically, the analysis consists of three steps. The first step is referred to as "problem formation," or justifying the theoretical and conceptual reasoning for a critical review of the literature. As discussed in the introduction and background sections earlier in this paper, the problem this analysis seeks to begin solving is the existing dichotomous nature of recent neighborhood change research. In other words, the aforementioned "gentrify or die" paradigm is the foundation of our problem. The second step is searching for the literature using a specified process. The third and final step is to gather and analyze necessary information from relevant studies that meet the defined process. The rest of this section consists of deeper dive into steps two and three of the methods.

Literature Search Strategy

The process for identifying articles was three-fold. First, I began with a web search to cast a broader net and hopefully lead to both academic and non-academic research using a variation of the following Boolean phrases below. This is not an exhaustive list but is intended to give an idea of the research strategy.

- "displacement" AND "neighborhood"
- "forced move" AND "neighborhood"
- "neighborhood change" AND "exit"
- "neighborhood change" AND "mobility"
- "neighborhood displacement" OR "disinvestment"
- "disinvestment" OR "displacement" OR "neighborhood"

Second, I used the same types of phrases listed above but in more traditional academic databases for published and working papers, including Google Scholar, NBER, Research Gate, JSTOR, SSRN, and the like. Third and finally, I reference-scraped all research found in the first two steps to be sure my search methods are covering as much of the conversation as possible.

The characteristics for the types of papers I searched for were, first and foremost, centrally focused on ways neighborhoods have changed, are changing, or could change in an urban setting. No suburban or rural papers on neighborhood change were included, though some studies do discuss regional household mobility within a metro region for example. This could lead to the inclusion of studies that discuss "first-ring suburbs" or municipalities close to the central city of a metro area (Greenlee, 2019). Next, the papers directly or indirectly focused on displacement or the ability of a lower-income family to obtain housing in an urban context. Finally, the papers were published within the last 20 years or so (during or after 2001) and

attempted to measure either displacement, mobility, housing options for LMI households, or neighborhood conditions that impact all the above.

Gathering and Analyzing Studies

Next, the relevant studies were gathered and analyzed using the following approach. First, the analysis examined the specific indicators used in each study, dividing indicator types into three categories: appreciation indicators, disinvestment indicators, and displacement indicators. Appreciation indicators consist of commonly used data points from relevant studies that look at the impacts of hyper-appreciation or gentrification pressures, such as household income, college-educated, housing tenure, etc. As previously discussed, disinvestment indicators include common pieces of information found in urban disinvestment literature, such as vacancy, population loss, school quality, etc. For displacement indicator analysis, three specific types of displacement measures were analyzed. First, did the study measure a forced move such as an eviction, foreclosure, or state-sponsored move? Second, was there a measure of whether a resident exited or was displaced or priced out of a specific unit? Third, did the study measure displacement from a neighborhood?

Alongside the indicators, the analysis took a spatial approach to identify studies that were conducted in one city. As discussed earlier, the nature of urban academic research leaves scholars studying the cities they are familiar with or are located nearby. In the case of neighborhood change, this means that "superstar" cities like New York, San Francisco, Washington, D.C., and the like tend to receive outweighed attention and analysis. To see if this was borne out in the systematic review, a map of the single-city studies will be included, as well

as “research characteristics” that ask whether the study was conducted in the academy, a single-city, or a neighborhood; and if so, what specific city?

The final component of the gathering and analyzing phase of the systematic review centers on the disinvestment-induced-displacement (DID) analysis scoring. More specifically, the following questions were answered using an ordinal variable, with 3 being extensive evidence of the specific question, 2 being some evidence of the question or characteristic, and 1 being no evidence of the specific question or element.

- To what extent is neighborhood displacement measured and applied in a relatively weak regional housing market or sub-market as evident or acknowledged in the research?
- To what extent are any of the indicators used to define neighborhood change associated with or framed within the context of disinvestment (i.e., home value depreciation, demolition permits, business closure, etc.)?
- Are various neighborhood change processes, aside from gentrification, discussed at length in the study?
- What are the specific findings of the study? What are the levels at which displacement is or is not occurring in each study?

Identifying Key Gaps in the Literature

Initially, I identified 128 different scholarly and non-scholarly papers that measured neighborhood change. Since this paper is concerned with how the field operationalizes and measures neighborhood displacement, purely qualitative studies were not included though the analysis does include a paper that argues for “neighborhood perception” measures of mobility but still includes a quantitative aspect (Dantzler & Jones, 2021). Then, a brief title and abstract

review eliminated 56 additional studies that were not relevant to questions of neighborhood change and displacement. Specifically, words like "displacement" or "mobility" picked up many articles that were not relevant to neighborhood change. Many papers did not concern urban topics or concepts. Phrases that included "neighborhood" were the most accurate and useful in returning relevant research. Finally, a full read of the article and initial results from the analysis eliminated an additional 50 studies that discussed neighborhood change broadly but did not focus on aspects of change that either make it harder for LMI households to live there or force a household to exit a neighborhood. In the end, there were only 32 studies that met these requirements, with 15 of them coming from researchers outside of the academy or studies published in non-scholarly or non-peer-reviewed journals, websites, and the like. The remainder of the discussion will first define what this paper categorizes as "appreciation indicator" and "disinvestment indicator" before detailing the indicator analysis conducted in this systemic review of neighborhood displacement research. Before ending the analysis with the mapping results and finally, the DID analysis scores.

To better comprehend how previous research has applied concepts of appreciation and gentrification pressures, as well as disinvestment and decline, there is a need for a clear categorization of research indicators. These are specific data points pulled from the displacement and disinvestment literature that each meets a variety of requirements. First, the appreciation or disinvestment indicator must have been used in more than one study. Secondly, the indicator should be pulled from a dataset that is not novel or proprietary but instead is relatively available through either the census or another national public dataset. Finally, the indicator should measure a specific neighborhood characteristic and not a perception or subjective view of a place. In other words, these need to be quantitative in nature and are objective to a certain extent.

Appreciation indicators will include things such as median household income, educational attainment, and home value increase. Disinvestment indicators will include vacancy, population loss, home value decline, and school quality.

Table 1 shows the results of the research characteristics, appreciation indicators, and disinvestment indicators. The indicators used for appreciation are not intended to mirror gentrification measures directly but are better suited for measuring the market demand implications commonly associated with gentrification pressures or the like. For example, all but three studies use household income, and all but eight studies look at race or ethnicity change. College-educated is far less commonly used, with only 19 studies measuring it. Surprisingly, only half of the studies looked at home price change or increase. Out of the indicators analyzed, housing tenure was the least common, as only 14 studies looked at that. While both home value and tenure are self-reported in the U.S. Census, many researchers are hesitant to use those data for fear of accuracy concerns.

Table 1. Systematic Review of Appreciation Indicators and Research Characteristics.

	Research Characteristics				Appreciation Indicators					Disinvestment Indicators			
Author/Year	**Single City**	**Neighborhood**	**City Name?**	**Academy**	**Median HH Income**	**Pct College Educated**	**Race/Ethnicity**	**Home Value Increase**	**Housing Tenure**	**Vacancy**	**Population Loss**	**Home Value Decline**	**School Quality**
Freeman & Braconi, 2004	X		New York City	X	X	X	X						
Freeman, 2005				X	X	X	X						
Ellen & O'Regan, 2008				X	X	X	X						
Chapple, 2009	X		San Francisco		X		X	X					
Ellen & O'Regan, 2011				X	X	X	X			X			
Bates, 2013			Portland		X	X	X	X	X				X
Hwang & Sampson, 2014	X		Chicago	X	X	X	X	X	X	X		X	
Revel - Sims, 2015	X		Los Angeles	X			X						
Tighe & Ganning, 2015	X		St. Louis	X	X		X			X	X	X	
Jackson, 2015	X		Washington D.C.	X	X	X	X	X					
Maciag, 2015					X	X	X	X					
Lopez & Greenlee, 2016	X	Bristol Place	Chicago	X	X		X	X	X				
Walker & Shelton, 2016	X		Houston										
Ding et al., 2016	X		Philadelphia		X	X	X	X					
Way et al., 2018	X		Austin		X	X	X	X	X				
IHS at DePaul, 2018	X		Chicago		X			X	X			X	
Shift Research Lab, 2018	X		Denver		X	X	X	X					
Immergluck et al., 2018					X		X		X				
Huq & Harwood, 2019	X	Albany	Chicago	X	X				X				
Goetz et al, 2019	X		Minneapolis-St. Paul		X	X	X	X	X				
Cohen & Pettit, 2019					X	X	X	X	X	X		X	
Orfield & Stancil, 2019					X						X		
Richardson et al, 2019					X	X	X	X			X		
Pries et al., 2020	X		Boston	X	X	X	X	X	X				
Carlson, 2020	X		New York City	X	X								
Richardson et al, 2020					X	X	X	X	X	X			
Lee & Evans, 2020				X	X	X	X		X				
Jones & Dantzler, 2021				X	X	X	X			X		X	
Siskar & Evans, 2021				X									

Of the 32 studies in Table 1, only two were studies of specific neighborhoods, and both were in Chicago. Twenty articles were single-city studies. Unsurprisingly, non-academic research was more likely to be focused on single cities, while academic articles were more likely to focus on a group of cities or, more commonly, a regional or national scope.

Comparing the disinvestment and appreciation indicators in Table 1 begins to highlight the expected gap in the literature. More specifically, when comparing the number of studies with at least one appreciation indicator (31) to those with at least one disinvestment indicator (11). It becomes clear that the neighborhood change discussion has been dominated recently by concerns about gentrification and market appreciation. Only two studies attempt to measure school quality in any way, with only three measuring population loss. While home value appreciation and increase were not very common in Table 1, it was even less common in Table 2, with only six studies tracking home price change. Similarly, only six studies look at housing vacancy, which, to be clear, is not to be confused with a seasonal or rental vacancy which is a different matter entirely. For this study, vacancy is operationalized as a long-term or problematic vacancy most likely correlated with abandonment or deteriorated property condition.

After mapping the cities that had a single-city or neighborhood-specific study, the results overall were more geographically diverse than expected. Of the 20 single-city studies, half of them were limited to the coasts in cities such as Portland, Oakland, Los Angeles, New York, Boston, and the like. As expected, academic neighborhood change research was more likely to be included on the coasts and in larger cities such as Chicago, with two key exceptions, the uneven development study in St. Louis and the "chain displacement" study in Madison, Wisconsin. Though these studies will be discussed in more detail later in this section, it is worth noting that both studies framed their work in the important Marcuse (1985) displacement

research referenced in the background section of this paper. It is clear these papers were the outliers and not the norm.

Figure 1. Map of all Single-City Studies in Systematic Review

Neighborhood displacement research from outside the academy was more likely to take place in a larger variety of places, including Minneapolis, Denver, Austin, and Houston, just to name a few. While these cities are commonly associated with appreciating housing markets, the displacement research conducted was produced for a non-academic audience, mostly in the context of local policy discussions. Chicago and New York City were the most frequently studied cities, with four and three total studies in the analysis, respectively. This is to be expected as these two cities tend to dominate the urban research cannon.

Now turning attention to Table 2 and the extent to which these 32 studies measured displacement. Less than half (n = 15) of all studies measured displacement in some form or

fashion. A little less than 1/3 (n = 10) measured displacement by either forced moves, most commonly eviction, foreclosures, or state-sponsored forced moves (i.e., HOPE VI) or by a directly or indirectly forced move from a specific unit, which is referred to as "unit displacement." Though granular mobility data is overall difficult to come by, data tracking moves or exits from a unit is more readily available than data tracking exits from a neighborhood. For this reason, it was unsurprising to see only seven of the 32 studies (21.9%) track moves or exits from a neighborhood. There are two commonly used data sources in these studies. One is the Panel Study of Income Dynamics. A longitudinal panel survey that has tracked mostly the same group of families since 1968 and geocodes where they live every two years. The other most used national data source is Census Microdata, which samples a subset of census-takers and includes granular mobility data tracking moves between census tracts. Both datasets are restricted and require extensive applications. Therefore, the barrier to entry is often only crossed by academics which makes studies performed in the academy more likely to include neighborhood displacement measurements.

Overall, the lack of displacement measures is concerning and points to larger issues with neighborhood change research and how little we really know about what all contributes to a family's decision to leave a neighborhood. It is also why the question of whether gentrification leads to displacement was so difficult to answer, and these data constraints led many to claim it does not lead to displacement.

Table 2. Systematic Review of Displacement Indicators.

Author/Year	Forced Move	Unit Displacement	Neighborhood Displacement
Freeman & Braconi, 2004	X	X	
Freeman, 2005			X
Ellen & O'Regan, 2008			
Chapple, 2009	X		
Ellen & O'Regan, 2011			X
Bates, 2013			
Hwang & Sampson, 2014			
Revel - Sims, 2015	X	X	
Tighe & Ganning, 2015			
Jackson, 2015			X
Maciag, 2015			
Lopez & Greenlee, 2016	X		X
Walker & Shelton, 2016			
Ding et al., 2016			X
Way et al., 2018			
IHS at DePaul, 2018			
Shift Research Lab, 2018			
Immergluck et al., 2018			
Huq & Harwood, 2019		X	
Goetz et al, 2019			
Cohen & Pettit, 2019			
Orfield & Stancil, 2019			
Richardson et al, 2019			
Pries et al., 2020	X		
Carlson, 2020		X	X
Richardson et al, 2020			
Lee & Evans, 2020		X	
Jones & Dantzler, 2021			X
Siskar & Evans, 2021	X	X	

However, as more studies leverage more localized data sources, such as city-wide housing surveys or other qualitative surveys, the knowledge base has shifted to accepting that gentrification does induce displacement (Carlson, 2020; Jones & Dantzler, 2021).

To see whether that question has been asked or answered for the other side of the neighborhood change coin, disinvestment, look at Table 3 below.

Table 3. Disinvestment-Induced-Displacement Analysis Scores.

Author/Year	Weak Market	Disinvestment Indicators	Other Changes	TOTAL
Freeman & Braconi, 2004	1	1	1	3
Freeman, 2005	1	1	1	3
Ellen & O'Regan, 2008	2	1	2	5
Chapple, 2009	1	1	2	4
Ellen & O'Regan, 2011	2	2	3	7
Bates, 2013	1	1	1	3
Hwang & Sampson, 2014	2	2	3	7
Jackson, 2015	1	1	1	3
Maciag, 2015	1	1	1	3
Revel - Sims, 2015	1	2	3	6
Tighe & Ganning, 2015	3	2	3	8
Lopez & Greenlee, 2016	2	1	2	5
Walker & Shelton, 2016	1	2	2	5
Ding et al., 2016	1	2	1	4
Way et al., 2018	1	1	1	3
IHS at DePaul, 2018	2	2	2	6
Shift Research Lab, 2018	1	2	1	4
Immergluck et al., 2018	3	2	2	7
Huq & Harwood, 2019	2	2	1	5
Goetz et al, 2019	1	1	3	5
Cohen & Pettit, 2019	3	2	3	8
Orfield & Stancil, 2019	2	2	3	7
Richardson et al, 2019	1	2	2	5
Versey et al, 2019	1	1	2	4
Carlson, 2020	1	1	2	4
Richardson et al, 2020	1	2	2	5
Lambert-Mullen & Trejo, 2020	1	1	1	3
Pries et al., 2020	1	1	1	3
Lee & Evans, 2020	2	1	2	5
Jones & Dantzler, 2021	2	2	2	6
Sims & Iverson, 2021	2	2	3	7
Siskar & Evans, 2021	1	2	1	4

As a reminder, each of the 32 studies was scored on a 1-3 scale in three main areas, one being no existence of that characteristic, three being extensive existence of that characteristic. The three main areas were first the extent to which the study took place in a weak market or, in the case of national/regional studies, acknowledged or highlighted weak market characteristics. The second is whether disinvestment indicators, qualitative or quantitative, were discussed and included in the research. Third and finally, were other changes aside from gentrification or appreciation pressures discussed in the study. The lowest score a study could receive is three, and the highest is nine. Two studies scored eight, but no study scored a nine, while over 20% (n = 7) of studies scored the lowest score, a three.

The average score across all 32 studies was 4.9, meaning overall, the studies were largely focused on gentrification, occurred in a strong market context of framing, and rarely mentioned disinvestment indicators. The two 8s, one applied research conducted in five cities by Urban Institute, the other a paper on uneven development and divergent city theory conducted in St. Louis, were the closest to disinvestment-induced-displacement, though the term does not appear in either study (Tighe & Ganning, 2015; Cohen & Pettit, 2019). There was not a single study that received a three in disinvestment indicators since disinvestment was never centrally important to any of the studies. There were over half (n = 17) that mention and include disinvestment measures but were almost always a secondary or tertiary focus and either a counterpoint to gentrification or, in many cases, grouped in with "non-gentrifying" tracts and neighborhoods as the "other" category.

There were three studies that foregrounded weak market contexts, the two studies that received an 8, but also a study on low-cost rental loss in Southeast metros that uses terms like "downgrading" and "bottom-of-market" exits to explain why a cool market city like Memphis

has lost the most low-cost rental units in the years following the subprime mortgage crisis. In the studies analyzed, this process is the closest to disinvestment-induced-displacement, though it applies to loss of affordability, and the study does not directly address residential or neighborhood displacement (Immergluck et al., 2019).

Somewhat surprisingly, the "Other Changes" category produced the most 3s. There were seven studies (21.9%) extensively discussing other changes aside from gentrification. Such processes researched include concentrated poverty, chain displacement, divergent city, and residential segregation (Orfield & Stancil, 2019; Sims & Iverson, 2021; Tighe & Ganning, 2015; Hwang & Sampson, 2014). The growth in research on other neighborhood changes is aided by the fact that in the last two or three years, many studies in the non-academic setting have pointed to many urban neighborhoods with consistent poverty as an alternative to the outweighed attention gentrifying neighborhoods receive compared to the number of urban neighborhoods classified as gentrifying (Pettit & Cohen, 2019; Orfield & Stancil, 2019, Richardson et al., 2020). However, disinvestment as a neighborhood change concept is still rarely discussed alongside displacement, let alone as a contributing or displacing force.

Discussion of Findings

The purpose of this piece was to better identify the shortcoming in existing displacement research, specifically as it relates to the nuance of neighborhood change. This systematic review showcases the lack of nuance in recent urban research on neighborhood change and displacement with a clear over-emphasis on gentrification and larger cities. Other market contexts and smaller, more mid-size cities and metros receive little to no attention, even in non-academic settings. This suggests that current research on neighborhood change is only reifying the previously mentioned

"gentrify or die" paradigm, where the notion of gentrification and neighborhood-life cycle theory produce two polarizing destinies for an urban neighborhood. Either these neighborhoods will gentrify, or they will "die" in a manner that makes it easier to gentrify when the time comes. It is clearly not enough to categorize disinvestment as a "not-gentrifying" or "other" category when neighborhood displacement typologies are produced in these studies, and questions of abandonment and disinvestment should be centered alongside other neighborhood change types (residential segregation, concentrated poverty, etc.)

Another implication of this research is the impact of restricted access to granular mobility data. This is a finding that other analyses on displacement echo (Hwang & Lin, 2016). It is certainly problematic for neighborhood advocates and practitioners who are left to deal with the "gentrify of die" realities this lack of data re-produces. Not to mention the challenges it produces for researchers who want to examine the extent to which disinvestment and abandonment lead to displacement or other types of neighborhood change processes. Overall, it hamstrings how much we can learn about displacement broadly, and it is clear the impacts of these data challenges on the research.

Where most displacement research focuses are also a key takeaway from this piece. Though the non-academic body of research disrupted this reality to a certain extent, it was clear that in just about every instance where a single-city study was conducted, it occurred in a growing, larger city. Unsurprisingly, Chicago and New York were the most studied. This is a problem for two reasons. First, most Americans do not live in Chicago and New York or even cities in that same category, such as San Francisco or Washington D.C. If the majority of neighborhood change research is occurring in these settings, it limits what we know about the rest of U.S. cities and how neighborhood change plays out in those communities. Second, the

market homogeneity of neighborhood displacement research limits what we know about neighborhood change in times and places when prices are not rapidly increasing. This point has been made by other research displacement studies in calls for future research (Lee & Evans, 2020).

Ironically, not only does the lack of focus on disinvestment spell trouble for smaller cities and regions, but it also represents a missed opportunity of sorts in growing markets as well. By zooming in on gentrification in areas experiencing well-documented housing supply constraints, researchers are missing other ways other cities (even growing ones) can lose not just affordable rental supply but livable housing supply in general: abandonment. The market is rarely a cure-all for vacant/dilapidated houses, and even the most developed and dense cities in the world have units lost to abandonment and disrepair, the so-called "shadow inventory" that could be a source of supply in dense urban areas where land is scarce.

Limitations

This paper includes three fundamental limitations, although the list of limitations is not exhaustive. First, the analysis was built from existing literature. Although the stated methods did their best to identify as much literature as possible, there is no way to know whether the 128 articles found are the totality of all research on this topic. Even though the systematic review looked at more than just scholarly articles, well-resourced think tanks or policy shops that dominate the grey literature space often operate from similar locations as academic researchers. It was difficult to avoid this reality. Still, it did slant the research towards a hotter-market perspective where gentrification is more likely to be expected, and there may have been some less known research captured in this analysis. Second, it is sometimes difficult to fully

disentangle displacement as an outcome of gentrification-induced displacement from the process. The blurriness of those lines can limit researchers' abilities to look solely at displacement as an outcome isolated from the various processes that lead there (e.g., gentrification, disinvestment, etc.). When possible, the analysis foregrounded displacement as the outcome, and the processes to get to that outcome remained in the background. Third and finally, though the research is concerned primarily with neighborhood displacement, there is not always a clear distinction between the different types of displacement, particularly in the non-scholarly literature. When possible, the analysis sought to focus on direct *neighborhood* displacement or forces associated with residents leaving a neighborhood. The research minimized to focus on cultural, political, or exclusionary forms of displacement.

Next Steps

Following this systematic review of neighborhood displacement, the clearest next step is to conduct a neighborhood displacement analysis that centers on disinvestment variables such as vacancy and abandonment, prior population loss, school quality, crime, and the like. This would answer the question: "is disinvestment as a process associated with neighborhood displacement?" No research has directly asked that question since Marcuse's (1985) seminal piece on displacement in New York nearly four decades ago.

Another element of answering that same question is the estimation of the extent to which disinvestment-induced-displacement is occurring in U.S. cities. After identifying the specific factors that contribute, a multi-variate measure could be created that is mappable and analyzable in ways that also examine the relationship between DID and other neighborhood indicators such as racial composition and educational attainment.

Other potential next steps could respond to data access challenges with granular mobility and opt for more qualitative surveys that could also look at less quantitative indicators and more on neighborhood perception, as other neighborhood researchers have also called for recently (Jones & Dantzler, 2021). This methodology would be a difficult and costly endeavor to pull off on a regional or national level but could be helpful for block, neighborhood, or city-level displacement analyses.

As more is learned about ways disinvestment might lead to displacement, policy research can take place, and anti-displacement strategies can begin to include responses to disinvestment in addition to existing strategies that focus on preserving affordability and autonomy in the face of gentrification pressures. Much more work is needed before we can get to solving disinvestment-induced-displacement, since there is clearly so little we currently know.

ESSAY 2 - TOWARD A SPECTRUM OF NEIGHBORHOOD CHANGE: IDENTIFYING DISINVESTMENT FACTORS THAT ARE ASSOCIATED WITH NEIGHBORHOOD DISPLACEMENT

Why Disinvestment and Displacement Matters?

In recent decades, more attention than ever is getting paid to displacement, or the direct or indirect removal of working-class residents from an urban residence, neighborhood, or jurisdiction. The idea of urban displacement is by no means a new one, with the earliest conceptualizations of residential mobility and its implications dating back to the early 20th century (Burgess, 1928; McClenahan, 1929). However, in recent years one specific variation of displacement has dominated the discourse: gentrification. Originally conceptualized by a London sociologist in the 1960s, the process has typically been defined as "the gentry" or upper-middle-class residents reclaiming previously working-class neighborhoods (Glass 1964; Freeman, 2005; Zuk et al., 2018). As evident by this dissertation's first essay, displacement is rarely discussed outside of the gentrification context.

The result is a phenomenon I call the "gentrify or die" proposition. This proposition situates two polar destinies for most urban neighborhoods. Either the area's fortunes turn around, and it sees concentrated hyper-appreciation akin to gentrification. Or the neighborhood will experience this so-called "inevitable decline" common in urban ecological theories. There are several reasons for this reality, but the role of race in this process of segregation and uneven development cannot be overstated (Krysan & Crowder, 2017; Smith, 2010). Within this conceptual framework of racialized uneven development, the "gentrify or die" proposition springs from and simultaneously operates within. Further discussion and definition of this concept will occur when key terms are defined.

The lower-income residents (100% AMI or lower) do not discuss or invoke the term "gentrify or die," primarily because of their vantage point. However, those community development or neighborhood change actors who are "seeing like a state" or those coming to terms with their understanding of a place through maps, plans, and market analyses, are most likely to adopt or invoke the "gentrify or die" frame of mind (Scott, 2008). It includes but is not limited to urban planners, community developers, real-estate developers, local government officials, and other community-based entities understanding how an area changes in a more top-down fashion.

My conceptualization of the "gentrify or die" phenomenon comes from my time as a community development practitioner working in urban neighborhoods, often in a legacy city or shrinking city context. The lived realities of this polarization were palpable in many of the communities in which I worked. The "gentrify or die" way of thinking tended to manifest itself in a version of the following. Community development corporation X would want to do Y intervention, be it a public art installation, community garden, farmers' markets, or something similar. Even if the proposed project was not a large-scale mixed-use development or another project commonly associated with gentrification pressures, the shadow of gentrification still loomed largely. It should go without saying, these concerns are valid and rooted in decades of an imbalanced, racialized political economy and deserve to be treated as such. However, upon diving deeper into the research, I noticed that neighborhood change's public discourse also foregrounds gentrification. In doing so, the sensationalization of the topic casts a long shadow that makes it difficult to discuss the nuances of change at the neighborhood level. Academics broadly researching neighborhood change in rapidly appreciating markets such as New York City, Los Angeles, Chicago, Washington D.C., and San Francisco were dominating the dialogue

to the point where legacy cities such as Cleveland, St. Louis, Birmingham, and Memphis struggled to create space for their market realities in urban neighborhoods more threatened by erasure by decline, than erasure by hyper-appreciation (Freeman, 2005; Hyra, 2015; Mallach, 2020).

Responding to this dangerous oversimplification of neighborhood trajectories is where this paper seeks to carve out its space. From here, the paper will go as follows. First, further background into theories and evidence of urban disinvestment and neighborhood displacement will be discussed. Then, the data and methods for this quantitative exploratory study will be detailed, beginning with the research question and hypothesis before moving on to a discussion of my analytical approach and the various datasets used to carry out such an analysis. Then, the results of the statistical analyses are detailed before discussing the implications of these findings for community development practitioners and urban policy actors. This piece will conclude with a brief discussion of key takeaways and future trajectories to expand this growing body of disinvestment-induced-displacement research.

Disinvestment & Displacement Background

The problematic "gentrify or die" axiom this research is confronting is a direct byproduct of racialized uneven development, as other parts of this dissertation and recent research have previously named and discussed (Mallach, 2018; Tighe & Ganning, 2015). These are complex concepts that entire college courses are devoted to discussing. However, before digging into the details of methodology and results that help link disinvestment factors to a household's exit of a specific neighborhood, a deeper discussion of urban disinvestment and the rare interplay between displacement and disinvestment is warranted.

Urban Disinvestment

Conceptualizing concentrated abandonment as both the cause and the outcome of spatially concentrated decline is often characterized by the condition of the built environment (Haase et al., 2014). The compound impacts of such vacancy are shown to affect everything from public safety and health to nearby property values (Accordino & Johnson, 2000; Raleigh & Galster, 2015; Wang & Immergluck, 2018; von Hofe & Grabill, 2019). Long-term housing vacancy, often operationalized as six months or more, is seen as the most problematic form of vacant properties. Many urban neighborhoods, especially in weaker market cities, can see stagnant and persistent hyper-vacancy (Wang & Immergluck, 2019; Mallach, 2018b).

Frequently, areas of vacancy and decline are strongly correlated with race (Harrison & Immergluck, 2020). There are well-documented political economy implications of which neighborhoods decline and why, through both a historical and contemporary lens (Sugrue, 1997; Hackworth, 2019). And residential segregation exacerbates spatially concentrated decline and poses barriers to addressing the decline (Squires et al., 1989; Thomas, 2013). This is one reason this paper centers on ideas of "racially" uneven development that ties systems of neighborhood development with key residential segregation problems facing them collectively.

In most cases, redevelopment efforts or policy responses to decline are market-adjacent or market-centric in ways that reproduce the very uneven development patterns they were looking to address (Hackworth, 2014; Tighe & Ryberg-Webster, 2019). However, some advocates for revitalization policies and actors, such as land banks or CDCs, claim their incremental role stymies negative impacts of the market in ways that ultimately benefit the community (Fuji, 2016; Alexander, 2015). Regardless, patterns of uneven development persist,

and understanding disinvestment processes that are associated with household exits will lay the foundation for further fertile revitalization and neighborhood impact discussions.

Disinvestment & Displacement

There is one study that closely discusses the dichotomous realities of displacement and really lays the groundwork for the recent revival in research that pairs questions of decline with displacement. This all originates from 1980s New York City research, where abandonment and gentrification pressures were simultaneously apparent. A critical geographer used what he observed to discuss the double-edged sword of neighborhood change (Marcuse, 1985). Specifically, this paper discussed the various displacement pressures caused by both appreciation and depreciation at varying scales using late 70s and early 80s New York City as his case study to observe this dichotomy.

In his 1985 piece, Marcuse discusses five different types of displacement but two primarily related to disinvestment or decline: "last-resident" and "chain" displacement. The former is likely self-explanatory. These are areas that have experienced significant abandonment, and lower-income households are often the last to leave. Chain displacement is more precarious and relates to slightly higher-income households who leave dwellings that are not yet abandoned. For Marcuse (1985), displacement is conceptualized at a unit-by-unit scale, and one can have different processes of displacement occurring in the same place at the same time. For example, Marcuse (1985) argues that chain and last-resident displacement often happen alongside each other in declining neighborhoods. This paper will lean more heavily on last-resident displacement since it is concerned specifically with low-to-middle income households that are

below the national median for household income (<100% AMI). These households are less likely to have the resources to leave before becoming the "last-resident" on the block.

Other than Marcuse's (1985) types of displacement, there are few other places where decline and disinvestment are side-by-side completely. However, two threads of the urban triage and disinvestment theoretical cannon connect to displacement indirectly: neighborhood life-cycle theory and urban shrinkage.

Neighborhood life-cycle theory (NLCT) was one of the earlier theories conceptualized to understand urban neighborhood change, gaining popularity in the post-war era with roots in the real estate appraisal field. This concept foregrounds an ecological analog treating the neighborhood like a living being that must "die" or decline sooner or later (Downs, 1991; Downs, 1998; Metzger, 2000). This project will take a critical lens toward NLCT by showing how disinvestment contributes to household exits, seeking to display the deliberate nature of disinvestment as a process. If successful, this will replicate what Marcuse was able to do in his (1985) New York City piece, as he used his displacement theories to show how a recently bankrupt city was choosing which neighborhoods to "save" (Marcuse, 1985; Seymour & Akers, 2022). This is a process today called "urban triage" and can be thought of as a "direct descendent" of NCLT.

The second essential theory is a more useful conceptualization of how, why, when, and where neighborhoods decline that has contemporary global origins popularized in the years following the great recession: urban shrinkage (Haase et al., 2014). Shrinking city literature, especially work by Haase and colleagues (2014), situates urban shrinkage as simultaneously a presumption, outcome, and process. Other scholarship reinforces this nuanced conceptualization

of shrinkage, which influences the spatial selectivity of the demographic changes and the active multi-dimensional reality of shrinking cycles (Galster, 2019).

Broadly addressed under this same uneven development umbrella, critical geographers describe the racialized and segregated ways in which urban areas develop over time and the implications those spatial development patterns have on specific neighborhoods, sometimes resulting in simultaneous growth and shrinkage (Smith, 2010; Harvey, 2005; Tighe & Ganning, 2014; Immergluck et al., 2018). This evidence is used to support the "divergent city" theory or oftentimes called the "divided city" (Tighe & Ganning, 2014; Mallach, 2018). In the decade following the subprime mortgage crisis, researchers observed the uneven recovery and began digging back up these uneven development concepts to help make sense of the current moment. The realities of the COVID housing market have also discussed the way even the strongest of housing "booms" still leave many predominantly Black and Brown neighborhoods behind (Gregory, November 18, 2021). So divergent cities and related concepts, such as disinvestment-induced-decline, are going to continue to see more attention.

The realities of the current housing market are maybe one reason the scholarly research around neighborhood change is starting to bring questions of neighborhood change, displacement, and decline to the fore. One piece that came out earlier this year focused on Detroit and built on Marcuse's (1985) types of displacement to connect displacement pressures with decline using evidence from Detroit. More specifically, the authors look at the way Detroit "recovered" from the subprime mortgage crisis and how systems such as tax foreclosure drove predatory land investment that only speeds up the deterioration of a place, further displacing that place's residents (Seymour & Akers, 2022). Relatedly, another paper that applied Marcuse's (1985) "chain displacement" theory to the Madison, Wisconsin housing market saw some

precarity that also supports ideas of decline, using multiple evictions even in a college town market. (Sims, 2021).

In addition to building on Marcuse, other research has examined why economically mobile households, specifically Black households, are leaving historically Black urban neighborhoods for their whiter, more suburban counterparts. One study looked at Black homebuying decisions in legacy cities, showing how historically middle-class Black neighborhoods were beginning to see their "replacement gap" grow as the homes upwardly mobile folks were leaving behind were contributing to the decline of the community they were leaving (Mallach & Harrison, 2021). Another study that looked to predict the "Black exodus" in Chicago found that declining processes and events, such as foreclosure, were the most accurate predictors of which neighborhoods would see a high rate of Black out-movers (Snidal et al., 2022)

By just looking briefly at the disinvestment and displacement background, it is easy to see how complicated and nuanced these neighborhood change discussions are. It is even easier to see how displacement and neighborhood change cannot just center on gentrification. So then, what are other disinvestment factors that are associated with neighborhood displacement?

Identifying Disinvestment Factors That are Associated with Neighborhood Displacement

Research Question

Following Essay 1's critical examination of existing displacement research, Essay 2 will explore which disinvestment indicators are associated with household exits. If we can reject the notion disinvestment is a natural process and reject the idea that neighborhoods only have two options: gentrify or die, then it becomes clear that urban shrinkage and decline are deliberate

processes supported by a myriad of both state and market actors (Haase et al., 2014). Therefore, there are real events, conditions, and actions that accompany disinvestment that are quantifiable, allowing analysts to understand which specific factors are most associated with household exits.

As a result, the second essay will perform a variety of multivariate analyses across all U.S. metro areas using a dataset built from the Panel Study of Income Dynamics (PSID) and other secondary data. These data will help answer the research question: *what disinvestment factors are most associated with neighborhood exits?*

Hypotheses

The research design for this essay centers around a linear probability regression model. The unit of analysis for the dependent variable is the household with both household-level and neighborhood-level independent variables. This is a similar approach to other prominent displacement studies that have used the PSID (Freeman, 2005). The hypothesis is below.

R.Q. → What disinvestment processes or conditions are associated with neighborhood exits of households making less than the local area median income?

H1 → Prior housing abandonment, Prior home value decline, prior school closures, and prior lack of external residential investment are significantly associated with an increased probability of the household exiting the neighborhood

Our priors for *H1* come from the literature suggesting that the impacts of market depreciation, school quality or school closure, and long-term abandonment on housing sub-markets and neighborhood change (Raymond, 2016; Nerenberg, 2021; Haase et al., 2014; Wang & Immergluck, 2019). There is no prior research that has linked these variables with displacement or neighborhood exits of households making less than the area median income.

Modeling Approach

As previously mentioned, Essay 2's analysis strategy leverages a regression with a household-level dependent variable. In other words, the model estimates the likelihood a family decides to leave a neighborhood. This analysis first conducts a linear probability model (LPM) before conducting other analyses for robustness' sake. The proposal for this paper originally discussed using a standard binary logistic regression. The first model specifications for this analysis were strictly logistic. As preliminary models began to produce results, it became clear that the analysis should focus more specifically on lower-income households (<100% AMI). As this decision was made to focus on lower-income families, the DV (household exits) probability exceeded 20%. When the probability of the DV surpasses 20% and is less than 80%, linear probability models are said to be more accurate than logistic (Long, 1997). Therefore, the primary models will be LPM, and logistic regressions will be a part of the robustness checks. The logistic results can be found in Appendix A. The linear probability model is of the form:

$$Y_i = a + \beta_1 \boldsymbol{D}_i + \beta_2 \boldsymbol{HH}_i + \beta_3 \boldsymbol{N}_i + \beta_4 \boldsymbol{M}_i + \varepsilon_i$$

The equation above is used to estimate the likelihood of a household leaving the neighborhood. Where, Y_i represents the probability of a household exiting a neighborhood $Y_i = 1$) or the converse, staying in the neighborhood, $Y_i = 0$) from one PSID survey wave to the next wave two years later. In the model above, **D** represents the vector of disinvestment variables built from the neighborhood decline literature. These are factors that will be measured based on the condition of a neighborhood prior to exit could have occurred. For example, if a family leaves a tract between the 2015 and 2017 waves, the neighborhood variables of interest will be

pulled from 2014 or earlier. The remainder of the equation includes **HH**, which is another vector of variables collected at the household level, introducing a multi-level element to the model for a series of household-specific controls thought to be impactful on a family's decision to leave a neighborhood. To conclude the household model, **N** represents a vector of other neighborhood characteristics, including some variables from the displacement literature often associated with gentrification, and **M** will change between phases of research. In one phase, it will represent a vector of relevant metro variables. In the other phase, it will be a series of fixed-effect dummy variables to control for unobservable variance caused by regional metro factors. The dual approach here is due to the limited knowledge of ways metro or regional growth contributes to neighborhood change processes such as disinvestment or displacement (Harrison & Immergluck, 2021). An identical version of this model was conducted for standard logistic regression as well to ensure the robustness of findings, given the exploratory nature of the research.

Dependent Variable

Much research on neighborhood changes and mobility is hamstrung by the lack of data measuring granular mobility decisions (i.e., leaving a neighborhood). The census makes information on mobility between cities, counties, or states publicly available, but that does not tell much about when and where families are moving between neighborhoods within a city.

As a response to the lack of granular mobility data, the dependent variable for this study comes from the PSID. Since 1968, the PSID has followed a core (but expanding) group of families and the individuals within those families, reporting on key aspects of the social, economic, and professional lives. Since 1996, the PSID has conducted a new survey every other year. The survey was annual prior to 1996, but this analysis only looks at exits in the housing

recovery period (2013 – 2017), so no data from prior to 1996 is included. In the survey, it asks for the address of the reference person's current residence. PSID staff then geocodes that resident to the census tract level, thus allowing researchers to use PSID to track moves at a variety of geographic scales (Freeman, 2005).

Creating our household-level dependent variable from the PSID is a straightforward process and is informed by past research that has used PSID to track or measure some form of neighborhood exits (Crowder et al., 2008; Crowder et al., 2011; Spring et al., 2017). Does the census tract this family lives in during a baseline year (2015) differ from the census tract they are in the following year (2017)? If it does, the family gets a 1 for the household exit indicator. If it does not differ, then they get a 0. This also means any family that moved within the same census tract will also get a 0 for resident exits in this study since this research is focused on exits from a neighborhood.

Despite being an unprecedented dataset in the social sciences, with more detailed information on households than few other surveys of its scale, previous research has sufficiently problematized PSID coverage and attrition, specifically when it relates to our target population, low-to-middle income houses in urban areas (Dantzler & Rivera, 2019; Fitzgerald et al., 1998). To better understand how coverage and attrition hinder the ability to focus on what low-to-middle income households (<100%AMI) look like in the context of this study, see table six below. It compares this study's sample with the proportion of that universe of possible households in the U.S. This coverage information represents whether there was a lower income household in that census tract or metro area during the 2015 – 2017 PSID waves.

Table 4. Dependent Variable Coverage

Level	N	Coverage
Households	1,339	0.003%*
Census Tracts	1,102	1.98%
MSAs	202	52.74%

Note: There were approximately 47,785,414 households making less than the median according to 2015 ACS.

A little more than half of all metros are accounted for in the study sample. Conversely, less than 1% of all lower-income households are covered by PSID, and only ~2% of all metropolitan neighborhoods (census tracts) in the U.S. are represented. The metro neighborhood and household gaps are not entirely surprising since there has been previous research critiquing the lack of PSID representation in urban cores especially (Dantzler & Rivera, 2019). However, this lack of urban neighborhood coverage has not stopped various studies from using PSID data for their dependent variables in very similar exploratory ways to this study (Dantzler & Rivera, 2019; Freeman, 2005). Furthermore, the PSID does release weighted estimates to account for some of these coverage challenges. When testing the model specifications for this analysis, PSID weighted estimates were tested and not found to meaningfully alter results. The sample biases and their impact on this exploratory study will be further discussed toward the end of this essay.

Study Sample Justification

Given these coverage complications, a brief discussion on the decision to limit the study sample to just those households making less than the area median is necessary. In addition, a brief discussion of how the sample size was changed is also necessary. Traditionally, community development actors have targeted their services and interventions to "low-to-middle" income (LMI) households, often considered to be making less than the area median income (AMI). In many metro areas, the "middle" can be a misleading moniker. For example, in 2015, the area median income for San Francisco was $81,552, so 120% of that is $97,862.40. In other words, 120% of the San Francisco AMI is nearly six figures. For this reason, the study uses an area median to adapt the model to those specific local economic dynamics of that area and account for this significant difference in what "lower income" can mean from metro area to metro area.

Moreover, when running the models with the 120% AMI cut-off, the number of PSID households in that 100 – 120% range is crowding out the results and including families that have more autonomy and agency in their mobility decisions because of their relative income. Neighborhood displacement impacts many households, more than just lower income. The purpose of this research, however, is to carve a space for community-driven development discussions led by and for working-class households. These households tend to make incomes that are lower than their area's median. When Marcuse (1985) conceptualized the "last-resident" ideal, they were not considering the last resident to be making north of $70K.

The study sample started with the total number of complete PSID observations with accurate geocode information and used the reference person for each family much like prior similar research (Freeman, 2004). From there, every observation that lived outside of a metro area in 2015 (the baseline year) was dropped from the sample, following that there were 5,126

observations. Next, the observations where the total family income was over the area media were dropped from the study sample. This was the most substantial decrease in the study sample, constituting a 60.7% decrease in sample size. Finally, any observations that were missing home price value, vacancy information, or other key disinvestment variable data was also removed, a 33.6% decrease in the sample. The final sample size is 1,339. This is a less than ideal size but is large enough for this exploratory analysis.

Table 5. Study Sample Changes

Complete Observations	**Reason for Change**	**Percent Change**
6,798	Start	Start
5,126	Observation did not live in MSA	- 24.6%
2,016	Observation's Total Family Income < Area Median	-60.7%
1,339	Observation's census tract had complete disinvestment variable data coverage (home price index, vacancy, etc.)	- 33.6%

Interest and Control Variables

With so little prior knowledge around disinvestment and displacement, this study will build on relevant theory and evidence to find specific disinvestment factors that contribute to a household's decision to leave a neighborhood. There are few readily available datasets with national coverage that speak to core aspects of neighborhoods, such as connectivity or collective

efficacy. To reduce concerns about reverse causation, all independent variables (interest and control) will be time-lagged relative to the DV. Since the analysis is measuring exits that took place sometime between 2015 and 2017, the independent variables will measure the 2011 – 2015 period specifically. Static American Community Survey (ACS) variables will be pulled from the 2015 five-year estimates (2011 – 2015). Other static variables will come from 2014. Variables that measure change over time will measure from 2011 – 2014, ensuring that the time measured is indicative of the neighborhood prior to when the decision to leave was made. This is the case for all levels of variables (household, tract, and metro).

Table 6. Datasets/Variables to be Used in Multi-Variate Analysis

Variable	**What is Measured**	**Level**	**Data Source**	**Year(s)**
Dependent	Household Exits	Household	Panel Study of Income Dynamics (restricted)	2015, 2017
Disinvestment	Prior Abandonment	Tract	US Postal Service, long-term vacancy rate	2011 - 2014
Disinvestment	Prior Home Value Change	Tract	Federal Housing Finance Agency, Home Price Index (HPI)	2011 - 2014
Disinvestment	Prior Res. Investment	Tract	Urban Institute's Residential Investment Patterns [2]	2014
Disinvestment	Prior School Closures	Tract	National Center for Ed Statistics]	2011 - 2014
Control	Household Size	Household	Panel Study of Income Dynamics	2015
Control	Dwelling Unit Type	Household	Panel Study of Income Dynamics	2015
Control	Neighborhood Income	Tract	American Community Survey Mdn HH Income	2015 (5yr)

Control	Neighborhood Employment	Tract	American Community Survey Percent Professional/Technology jobs	2015 (5yr)
Control	Rent Costs	Household	Panel Study of Income Dynamics	2015
Control	Mobility Intentions*	Household	Panel Study of Income Dynamics	2015
Control	Family Tenure	Household	Panel Study of Income Dynamics	2015
Control	Family Income	Household	Panel Study of Income Dynamics	2015
Control	Family Race/Ethnicity	Household	Panel Study of Income Dynamics	2015
Control	Job Related Exit	Household	Panel Study of Income Dynamics	2015
Control	Neighborhood Race/Ethn.	Tract	American Community Survey, race/ethnicity	2015 (5yr)
Control	Lack of Nearby Job Density	Tract	American Community Survey, pct commuting 30+ mins to work	2015 (5yr)
Control	Neighborhood Tenure	Tract	American Community Survey, pct. rentership	2015 (5yr)
Control	Neighborhood Income	Tract	American Community Survey Mdn HH Income	2015 (5yr)
Control	Neighborhood Employment	Tract	American Community Survey Percent Professional/Technology jobs	2015 (5yr)
Control	Neighborhood Density	Tract	American Community Survey Population Density	2015 (5yr)
Control	Neighborhood Housing Stock Age	Tract	American Community Survey Median Yr Built	2015 (5yr)
Control	MSA Pop. Change	Metro	American Community Survey Population	2011 – 2014
Control	MSA Median Household Income	Metro	American Community Survey Median Household Income	2015 (5yr)
Control	MSA Home Value	Metro	American Community Survey Home Value	2015 (5yr)

Note: *Dataset will be used in robustness check of results

The table above details the datasets used and the type of variable the dataset will serve in our multivariate analysis. Given the lack of previous research on disinvestment and displacement, there is little known about which key disinvestment variables are likely associated with neighborhood displacement. I will discuss each of these variables of interest one by one.

The first variable will build on previous research connecting vacancy and abandonment to neighborhood change by using the long-term vacancy rate (6 months or more) as a measure for prior abandonment as evident through hyper-vacancy (Wang & Immergluck, 2019; Mallach, 2018; Harrison & Immergluck, 2020). The second variable measures residential financing access and availability as measured using tract-level indicators constructed by Urban Institute in their Capital Flows & Disparities research (Theodos et al., 2021). In the study, they look at commercial and residential investment together. Given this study's focus on neighborhoods and housing market dynamics, I will just use their residential variables constructed using loan-level Housing Mortgage Disclosure Act (HMDA) information on residential loans and investments.

The third disinvestment variable, home value change, will be measured using the Federal Housing Finance Agency's (FHFA) Home Price Index, built from FHFA lender data. It is a repeat sales index that also uses refinances (appraisals) to estimate a composite home price for the area. FHFA releases a tract-level home price index annually for every census tract in America. This measure is one of the more reliable and accessible national home price measures. The downside is, the index only captures transactions involving Fannie Mae and Freddie Mac, which make up a substantial share, but not the totality, of the housing market.

The fourth and final variable of interest, prior school closures, is pulled from the National Center for Education Statistics (NCES). To prepare the dataset, I added all school closures from

2011 to 2014, giving us a tract-level total of school closures over the last four years. The control variables include both household level and neighborhood level factors that are associated with mobility and neighborhood displacement. This includes variables from the gentrification literature, such as population density or percentage of the neighborhood that has professional or tech jobs, both indicators of potential hyper-appreciation and gentrification pressures (Zuk et al., 2018; Hwang & Lin, 2016).

Analysis Strategy

This essay's multivariate statistical analysis is structured to identify which specific disinvestment variables potentially contribute to a household's decision to leave a neighborhood. It cannot be overstated that this analysis strategy is *not* causative and is not attempting to be causative. There is so little we know about the interactions between disinvestment and neighborhood displacement that exploratory analyses such as these are necessary before causative analysis can even be possible. Therefore, this analysis is structured as exploratory for that reason and is divided into two phases. Each phase is broken down in Table 7.

Table 7. Phased Modeling Strategy

Phase 1		
Variable Type	**Model 1**	**Model 2**
Disinvestment Variables	X	X
Family Controls	X	X

Table 7. (continued).

Neighborhood Controls	X	X
Metro-level Controls	X	X
Family Mobility Intentions		X
Phase 2		
Variable Type	**Model 1**	**Model 2**
Disinvestment Variables	X	X
Family Controls	X	X
Neighborhood Controls	X	X
Metro Fixed Effects	X	X
Family Mobility Intentions		X

Each phase of the analysis includes the key disinvestment variables that were discussed in the previous section. They also include three levels of controls that sufficiently operationalizes the multi-level aspect of the analysis: family or household level controls, neighborhood level controls, and metro (MSA) level controls. For the metro controls, recent research is just beginning to grow a collective understanding of the regional economic impact on neighborhood change (Manduca, 2019; Hackworth, 2019; Harrison & Immergluck, 2021). As a result, the analysis will structure each phase around a different way to control for regional economic

impact. Phase 1 will be a vector of metro variables (median home value, population change, and median household income) pulled from previous research (Manduca, 2019; Harrison & Immergluck, 2021). Phase 2 analyses will include a vector of metro fixed effects that will control for *any* unobservable or unmeasurable impact of regional economic dynamics on household exits. Each phase will also include a robustness check related to mobility intentions. Let me explain further.

Previous neighborhood displacement research has struggled with this question of agency and autonomy in inter-neighborhood moves. Some research has suggested when a household is forced to move (i.e., eviction or foreclosure), it does not always result in the household leaving the "neighborhood," often operationalized as a census tract, and when it does, it often results in the household being forced to live in a "worst" neighborhood (Desmond & Shollenberger, 2015). This distinction between intention and agency is even more important for our study's sample, lower-income households below the national median household income. These are families urban research often characterizes as "stuck" (Sharkey, 2013). Therefore, the conceptualization of the "last-resident" pushes the idea that in systemically disinvested spaces, those that *can* leave will (Marcuse, 1985; Mallach & Harrison, 2021).

Due to all the above, this analysis will conduct multiple "robustness checks" of sorts, both within each phase and by introducing "Phase 3 and 4". The first robustness checks include a "mobility intentions" family-level variable from PSID. In the PSID survey wave, they ask, "are you intending to move in the coming year?" Families can answer "no," "definitely," "probably," or "unsure." The robustness check will use "no" as the reference and definitely/probably is one categorical variable and "unsure" will be the other. This will allow the analysis to see if the relationship maintains when we introduce "intended exits." This robustness check strategy

acknowledges and even pushes back against this "stuck" conceptualization of working-class families and is not supposing that lower-income households are completely void of mobility autonomy. Intended exits are also likely to have a strong statistical influence on the DV, so keeping that out of the initial analysis is a good idea to not cancel or override potential impacts from key disinvestment variables. This additional robustness check is carried out by first omitting the intended exits variable and then adding it as an additional household-level control variable to see how the disinvestment variables perform without this powerful control present.

Then, as previously discussed during the modeling strategy section, this analysis will also include "Phase 3" and "Phase 4." These will be exact replications of Phase 1 and Phase 2 but using binary logistic regression. Phase 3 will include the metro variables, and Phase 4 will use metro fixed effects.

The Disinvestment Factors That are Associated with Neighborhood Displacement

To better understand the relationship between the identified disinvestment factors or processes and neighborhood exits, the following section will discuss the results from this exploratory analysis, beginning with the descriptive statistics to orient the reader to the key variables and then Phase 1 and Phase 2 results.

Descriptive Statistics

Prior to running the linear probability models, there were a few steps necessary to fine-tune the final models. First, many different model specifications were tested to identify the specific criteria that are discussed herein. All four of the key variables were introduced as both categorical and continuous, with the more significant variable used in the final versions. It is during this model finalization that two variables mentioned extensively in the dissertation

proposal were removed: total violent crime in the neighborhood and prior population decline. The total violent crime came from the American Violence.org project, hosted by Princeton Sociologist Patrick Sharkey. These variables were removed for multiple reasons. One reason is removed there were not enough PSID households that were in the same tracts as crime data available on the website to include in the analysis (n = 227). This is too small of an N given the number of variables in the model (29). The prior population decline variables were removed because it was causing some reverse causation concerns being a disinvestment variable since household exits cannot be fully independent of prior population decline. While other variables have some of these same concerns, vacancy, for example, the two-way causal relationships are not as directly associated. For example, when a family leaves a home vacant, there is no guarantee that the family will leave the neighborhood. The same is true for if their school is closed, that also is not direct as population decline is to household exits. One measure is essentially nested within the other, which is a causal loop that is difficult to disrupt in this exploratory analysis. Also, the variable was not contributing much to the results, and it was not significant. Its lack of significance and its uniquely problematic nature were both reasons it too was removed following the proposal.

In both phases, all key variables are time-lagged to cover either the year prior or a period of 3-5 years prior to the baseline year (2015), and the year the move was reported by PSID (2017). The PSID does not provide the exact timing of the family moves, and for the purposes of this research, it is only important to know that they left the tract between 2015 and 2017.

Table 8. Descriptive Statistics.

Variable	Mean	St. Dev
Household Exit (2015-2017)	**0.294**	**0.456**
Some Vacancy 2011 – 2014* (0% to 3.99%)	**0.723**	**0.448**
High Vacancy 2011 - 2014 (4% to 9.99%)	**0.246**	**0.431**
Very High Vacancy 2011 - 2014 (10% to 19.9%)	**0.029**	**0.169**
Hypervacancy 2011 - 2014 (20% or more)	**0.001**	**0.035**
Percent Change in Home Value 2011 - 2014	**17.222**	**39.796**
Significant Residential Investment 2014* ($1M +)	**0.974**	**0.160**
Some Residential Investment 2014 ($500K to $999K)	**0.019**	**0.137**
Little to No Residential Investment 2014 ($0 to $499K)	**0.007**	**0.085**
Total School Closures in Tract from 2011 to 2014	**0.140**	**0.457**
Family Size	2.229	1.450
Families in a Single-Family Home	0.574	0.495
Families in a Duplex	0.051	0.220
Families in an Apartment	0.272	0.445
Families Own Home	0.609	0.488
Families Do Not Own Home	0.391	0.488
Family Head - White	0.645	0.479
Family Head - Black	0.297	0.457
Family Head - Asian	0.001	0.086
Family Head - Hispanic	0.047	0.174
Family Income	$ 31,588.39	$ 21,613.64
Recent Job-Related Exit (0,1) [3]	0.032	0.177
Proportion of Neighborhood White	67.118	25.831

Table 8. (continued)

Proportion of Neighborhood Black	21.262	25.550
Proportion of Neighborhood Asian	3.343	5.846
Proportion of Neighborhood Hispanic	14.798	21.228
Proportion of Neighborhood Commuting 30+ min.	34.694	16.131
Proportion of Neighborhood that Rents	36.718	18.178
Neighborhood Median Household Income	$ 53,737.19	$ 20,669.75
Proportion of Neighborhood with Pro/Tech Jobs	56.856	13.058
Neighborhood Population Density Per Square Mile	0.002	0.002
Median Age of Building in Neighborhood	54.132	129.853
MSA Population Change (2011 – 2015)	5.331	10.654
MSA Median Home Value	$ 214,239.70	$ 111,935.30
MSA Median Household Income	$ 56,342.99	$ 11,303.31
Family is Not Moving*	0.601	0.490
Family is Definitely or Probably Moving Soon	0.159	0.359
Family is Uncertain of Mobility Intentions	0.080	0.271

N = 1,339
Note: *Reference for Categorical Variable

Table 8 above shows the descriptive statistics for the study sample (1,339 PSID households making <100% area median income) and all variables included in all phases of the analysis, including the robustness checks. By viewing the descriptive statistics, it is also possible to see how the variables were operationalized for analysis. For the vacancy variable, there were four categories created based on similar categorizations used in the literature, as well as the distribution of the variable across the model sample (Harrison & Immergluck, 2021). “Some

Vacancy" is ultimately used as the reference since it is the least problematic variation of prior abandonment, accounting for tracts with 0% to 3.99% long-term (6 months or more) vacant. Many of the observations fall into the reference group, with around 72% of observations in this category. Also included in the model is "high vacancy," which represents tracts with 4% to 9.99% long-term vacant and accounts for roughly 24.6% of observations. The two most problematic versions of long-term vacancy and the two types of vacancy discussed the most in the urban shrinkage literature are "very high" vacancy or 10% to 19.9%, and "hypervacancy" or 20% of a tract's properties are long-term vacant (Mallach, 2018b). Very few observations fall into these types of neighborhoods, with 3% in very high vacancy and less than 1% in hypervacant neighborhoods. Given the low sample sizes of these two categories, the author did various models with them combined, but they were not significant, and this categorization operationalized key vacancy thresholds from the disinvestment literature (Mallach, 2018b).

For home value change, there were a variety of variable specifications used here before landing on percent change to quantify home value change from 2011 to 2014. As descriptive statistics show, the PSID families are living in neighborhoods that saw a large rebound during the early part of the subprime mortgage crisis recovery. The mean change is nearly 16%, with lots of variation in the distributions, evident by the standard deviation being 37.6% change. Admittedly, this is an interesting time to be looking at home value change in the early stages of the housing market recovery. Nearly a decade after this time, we now know how uneven that recovery was during this period (Raymond et al., 2016; Harrison & Immergluck, 2021). The heterogeneity of the recovery is evident in the descriptive statistics of the second variable.

The third key variable, prior residential investment, saw the most promising results when it was parsed out by investment category. Of course, this study is interested in areas seeing little or

no prior investment. It should be noted that investment measured in Housing Mortgage Disclosure Act (HMDA) data only measures more traditional lending strategies and fails to account for more speculative residential investment structures, such as private equity or institutional ownership, common in declining areas (Seymour & Akers, 2022). Even still, it is a robust dataset and has higher coverage than some of the other key variables. The reference for this variable is "significant residential investment," or areas that saw more than $1M in total residential investment (owner and non-owner-occupied). The tracts that saw less than $1M in investment are separated into two categories. One is the tracts that saw $500K to $999K in investment, and the other is tracts that saw less than $499K in total residential investment. 97% of all observations are in this significant residential investment category, roughly 2% are in the "some" category, and 1% are in the "little to no" residential investment category.

The final key variable is included as a continuous variable. Total school closures, which is the sum of all schools closed in the neighborhood (tract) from 2011 to 2014. With a mean of 0.132, it is clear study observations are mostly made up of tracts with no school closures. Various categorical variables were created when playing around with the models, but none of them were remotely statistically significant, and the statistical relationship was weaker than the continuous version.

As for the descriptive statistics of the control variables, the higher-income PSID households have been removed since the mean family income is a little over $30,000. Other than family income, a PSID sample that often seems to be predominantly single-family, mostly white, and living in neighborhoods that are also mostly white has been curbed by isolating lower-income households. The strength of the intended move variable is also noticed here since nearly 16% of the sample said they were "definitely" or "probably" moving soon. Roughly 3% of the

sample moved due to a job-related exit, indicative of low employment mobility. However, the neighborhoods in the study are still 67% white, and 64% of sample families have a white head or reference person. Also, the neighborhoods in the study have a median household income close to the national average ($53,044.30). Furthermore, an average of 57% of neighbors for the PSID families in the study are working in the technology or professional sector. The neighborhoods are not very dense, and most people tend to own homes. Also, a little over 1/3 of the residents in the sample neighborhoods commute over 30 minutes. Despite the 100% AMI threshold, this study sample is still showing some characteristics of more middle-class neighborhoods, a function of the PSID data and its sampling measures (Dantzler & Rivera, 2019).

Regression Results

Table 9 below includes the results from the first phase of the analysis, which includes the metro variables, not the fixed effect. There were 1,339 observations included in Phase 1 and Phase 2 (as well as logistic robustness). This includes all PSID households with accompanying complete neighborhood data. Only "missing data" that was omitted from the regressions were observations without complete data from all disinvestment variables.

I will use Table 7's areas of focus as a framework to delve into the key results, beginning with the disinvestment variables. Then touching on family control, neighborhood controls, and metro region controls. The conceptual framing here is important, given how previous disinvestment research has touched on how disinvestment is influenced by household, neighborhood, and regional factors (Mallach, 2018b; Mallach & Harrison, 2021; Hackworth, 2019). Therefore, when discussing the relationship between disinvestment and displacement, it is important to address this relationship at all levels.

This relative stagnation of the predictive power across not just both Phase 1 models but also both Phase 2 models and robustness checks (see Table 11; Appendix A) is likely due to the outweighed influence of the control variables. For all phases, the disinvestment variables have little influence on the models, as indicated by their standardized coefficients (betas). This is especially the case during the "intent to move" robustness check. That variable seems to be as powerful as I expected it to be and has a strong influence on predictive power.

Of the four disinvesting forces (vacancy, home value decline, predatory investment, and school closure) operationalized across seven total variables, three of the forces (four of the variables) showed some signs of significance. The fourth force, home value decline, is barely significant during the robustness check but not during the other phases. All four disinvesting forces deserve a close look in each phase of analysis.

The only force of the four that comes in and significantly encourages more exits across all models and phases is the hypervacancy variables. The hypervacancy variable has by far the largest significant coefficient. In other words, every time a neighborhood crosses that 20% threshold of long-term vacancy, there is a 53% increase in the likelihood that a family will exit when compared to the reference group (Some Vacancy, 0% - 3.99%). Worth mentioning that this is a smaller sample size of observations, but the findings are still very meaningful. When I introduce a control for mobility intention, that percentage change rises to 67%. One could consider this further proof of Marcuse's (1985) "last-resident" displacement. Especially given the fact that the "very high" vacancy category, which is still neighborhoods with 10% to 19.9%, more vacancy than one would think most families would want to have in their neighborhood, has a negative coefficient when compared to the reference.

Table 9. Phase 1 Regression Results, Estimation of Family Exiting Neighborhood, 2015 –17 for PSID Households <100% AMI

	Model 1				*Model 2*			
	Coeff	*p-val*	*Betas*	*SE**	*Coeff*	*p-val*	*Betas*	*SE**
High Vacancy 2011 - 2014 (4% - 9.99%)	-0.0175	0.582	-0.0162	0.0317	-0.0161	0.591	-0.0149	0.0299
Very High Vacancy 2011 - 2014 (10% - 19.99%)	**-0.1382**	**0.042**	**-0.0512**	**0.0677**	*-0.1086*	*0.099*	*-0.0402*	*0.0657*
Hypervacancy 2011 - 2014 (20%+)	***0.5490***	***0.000***	***0.0322***	***0.0474***	***0.6452***	***0.000***	***0.0379***	***0.0475***
Percent Change in Home Value 2011 - 2014	-0.0008	0.118	-0.0633	0.0005	-0.0003	0.417	-0.0258	0.0004
Some Residential Investment 2014 ($500K - $999K)	*0.1924*	0.077	*0.0560*	*0.1087*	*0.1871*	*0.057*	*0.0544*	*0.0984*
Little to No Residential Investment 2014 ($0-$499K)	-0.0738	0.635	-0.0106	0.1555	-0.0159	0.921	-0.0023	0.1591
Total School Closures in Tract from 2011 to 2014	*-0.0478*	0.087	*-0.0456*	*0.0279*	-0.0405	0.162	-0.0386	0.0289
Family Size	0.0146	0.105	0.0456	0.0090	0.0070	0.436	0.0218	0.0089
Family in a Duplex	-0.0085	0.878	-0.0041	0.0555	-0.0258	0.624	-0.0125	0.0525

Table 9. (continued).

Family in an Apartment	***0.1057***	***0.004***	***0.1032***	***0.0365***	***0.1044***	***0.003***	***0.1019***	***0.0347***
Total Family Rent ($100s)	**-0.0023**	**0.012**	**-0.0645**	**0.0092**	**-0.0019**	**0.044**	**-0.0545**	**0.0093**
Family Does Not Own Home	***0.2647***	***0.000***	***0.2739***	***0.0297***	***0.1596***	***0.000***	***0.1651***	***0.0317***
Total Family Income ($1000s)	0.0011	0.149	0.0343	0.0080	0.0008	0.363	0.0257	0.0008
Family Head - Black	-0.0155	0.656	-0.0164	0.0348	-0.0259	0.433	-0.0275	0.0330
Family Head - Asian	-0.1348	0.463	-0.0209	1.4074	-0.0861	0.628	-0.1335	0.1774
Family Head - Hispanic	**-0.1555**	**0.024**	**-0.0603**	**0.4047**	*-0.1165*	*0.083*	*-0.0451*	*0.0671*
Recent Job-Related Exit	0.1391	0.075	0.0539	0.0781	0.0993	0.207	0.0385	0.0786
Proportion of Neighborhood Black	0.0005	0.463	0.0264	0.0006	0.0000	0.961	-0.0017	0.0006
Proportion of Neighborhood Asian	0.0013	0.643	0.0156	0.0028	0.0023	0.399	0.0285	0.0028
Proportion of Neighborhood Hispanic	0.0005	0.614	0.0206	0.0009	0.0007	0.436	0.0290	0.0008
Proportion of Neighborhood Commuting 30+min	*-0.0017*	*0.066*	*-0.0603*	*0.0009*	*-0.0016*	*0.078*	*-0.0570*	*0.0009*
Proportion of Neighborhood that Rents (2014)	0.0017	0.144	0.0664	0.0012	0.0010	0.350	0.0391	0.0011

Neighborhood Median Household Income ($1000s)	0.0011	0.309	0.0214	0.0011	0.0003	0.831	-0.0101	0.0010
Proportion of Neighborhood with Professional/Tech Jobs	0.0010	0.501	0.0293	0.0015	0.0011	0.452	0.0313	0.0014
Neighborhood Population Density Per Square Mile	3.1064	0.698	0.0131	8.0079	3.5950	0.649	0.0152	7.9063
Median Age of Building in Neighborhood	-0.0015	0.817	-0.0070	0.0002	0.0000	0.938	0.0023	0.0002
MSA Population Change (2011 – 2014)	0.0007	0.496	0.0166	0.0008	0.0009	0.302	0.0211	0.0008
MSA Median Home Value ($1000s)	**-0.0004**	**0.030**	**0.0246**	**0.0019**	*-0.0003*	*0.093*	*-0.0841*	*0.0002*
MSA Median Household Income ($1000s)	-0.0007	0.695	-0.0165	0.0023	0.0018	0.385	0.0444	0.0002
Family is Definitely or Probably Moving Soon					***0.2716***	***0.000***	***0.2212***	***0.0395***
Family is Uncertain of Mobility Intentions					0.0643	0.148	0.0380	0.0444
N = 1,339								
R-square	0.1524				0.2289			

Notes: *Clustered (at census tract), robust standard errors; Bold and italicized = significant < 0.01; bold = significant < 0.05; italicized = significant < 0.10; "Disinvestment" Variables Bolded, included metro variables associated with household exits

Another way of saying that is when comparing neighborhoods with a little vacancy to neighborhoods with 10% to 19.9% vacancy, the likelihood of a neighborhood exit decreases by 11.4%. This result could be considered misleading, because it drops out when you add in the mobility intention variable. It may also be picking up some of the "top of market" displacement pressures common in areas with little to no vacancy. It is also worth noting the categorical variable measures the change between categories. It is possible the "high vacancy" and "some vacancy" categories could be experiencing displacement from gentrification pressures or the like, but that certainly is not a hunch this research can satisfy. Following that thread, however, would support the liminality of neighborhood change and displacement, and maybe there is a certain level of vacancy or decline that leads to disinvestment-induced or "last-resident" displacement (Marcuse, 1985).

The only force of the four that comes in and significantly encourages more exits across all models and phases is the hypervacancy variables. The hypervacancy variable has by far the largest significant coefficient. In other words, every time a neighborhood crosses that 20% threshold of long-term vacancy, there is a 53% increase in the likelihood that a family will exit when compared to the reference group (Some Vacancy, 0% - 3.99%). Worth mentioning that this is a smaller sample size of observations, but the findings are still very meaningful. When I introduce a control for mobility intention, that percentage change rises to 67%. One could consider this further proof of Marcuse's (1985) "last-resident" displacement. Especially given the fact that the "very high" vacancy category, which is still neighborhoods with 10% to 19.9%, more vacancy than one would think most families would want to have in their neighborhood, has a negative coefficient when compared to the reference. Another way of saying that is when comparing neighborhoods with a little vacancy to neighborhoods with 10% to 19.9% vacancy,

the likelihood of a neighborhood exit decreases by 11.4%. This result could be considered misleading, because it drops out when you add in the mobility intention variable. It may also be picking up some of the "top of market" displacement pressures common in areas with little to no vacancy. It is also worth noting the categorical variable measures the change between categories. It is possible the "high vacancy" and "some vacancy" categories could be experiencing displacement from gentrification pressures or the like, but that certainly is not a hunch this research can satisfy. Following that thread, however, would support the liminality of neighborhood change and displacement, and maybe there is a certain level of vacancy or decline that leads to disinvestment-induced or "last-resident" displacement (Marcuse, 1985).

The other variable that remains significant throughout Phase 1 is total school closures. These results are the direct opposite of my hypothesis, as school closures seem to have a negative impact on household exits. This could be due to the sample since the average family size was just over two (2.29), meaning most of the sample does not include larger families. The results reveal that for every additional school closed in a neighborhood (census tract), it decreases the likelihood of a household leaving the neighborhood by 4.78%. Unlike the very high vacancy variable, this relationship is virtually unchanged during robustness checks. The school closure discussion is a political economy microcosm of school choice, neighborhood collective efficacy, and community development (Good, 2019). Many urban school districts are responding to declining enrollments in schools located predominantly in Black and Brown neighborhoods and are signaling a move away from the idea of a neighborhood school (Bierbaum, 2021). Couple that with the rise of charter schools and the "school choice" movement, most evident in urban school districts, and maybe these results begin to make some sense. If the "neighborhood school" closes, it no longer means parents need to move to a district

with a "better" school. But instead, it means they might register for a school further away, or the family may attempt to enroll in a charter school or optional program. Again, it should also be noted that the small family size indicated in the summary statistics could mean a sampling bias of sorts is occurring against families with children here as well.

The third of the four primary disinvesting forces that see some significance across the models are the prior investment categorical variables. Somewhat surprisingly, little to no investment is not significant at all. A prior iteration of categories even included a "no investment" for tracts that did not see a dollar in 2014, but that also did not come in as significant. However, some residential investment, or $500K to $999K total investment, was significant across almost all the phases, including robustness. The connection between types of investment in declining markets and displacement needs even more attention than it has recently received (Seymour & Akers, 2022).

The only disinvesting force that had no significant findings at all in Phase 1 or Phase 2 is the home value change. The results for this variable are surprising in more ways than one. Previous research on neighborhood change and disinvestment suggests a certain pattern of relationship where it increases as values increase and then declines when values stagnate and then increases again when values begin to decline. To test this pattern, I ran models including the linear version, the quadratic version, and the cubic version. The expectation was that either the linear or the cubic would come in, hinting towards a more specific distribution pattern. But instead, the quadratic version of the variable was significant, but the other two were not, which suggests a parabolic distribution, counter-intuitive for home value change.[3]Across the three levels of control variables, the most interesting findings were primarily in the family or

[3] The quadratic home value change variable was significant at the 0.1 level whereas no other version of this variable was significant at any level lower than 0.4. The coefficient was positive but still small (<0.004)

household level and the metro level. In Phase 1, no neighborhood level controls are significant, and only two are even close: neighborhood rentership and lack of job density. Rentership has a positive impact on household exits at nearly a significant level (prior to robustness), and lack of job density has a negative impact, both unsurprising and insignificant relationships.

At the family level, there are a handful of significant findings. Families that live in apartments are more likely to exit neighborhoods, which is not surprising since, thanks to zoning, residential segregation, and uneven development patterns, most multi-family complexes are confined to similar neighborhoods or similar types of neighborhoods, often less white and less affluent (Manville et al., 2020). Similarly, there is clearly something about tenure that impacts household exits on a variety of levels (neighborhood and family). If you removed PSID family variables that account for total rent and whether the family owns a home or not, then it is likely the neighborhood rentership rates pick up some of that and becomes more significant. Both total rent and a binary for family ownership (do or do not) are significant, with total rent having a very small, negative coefficient and no ownership having a stronger, more significant impact. Also, recent job-related exit is significant because it is picking up some mobility indentions, as evident in the robustness check.

At the metro level for Phase 1, where there are variables instead of fixed effects, the results show something interesting occurring here. The current median home value for the MSA is negatively related to household exits. So as median home values decrease at the metro level, there is a higher chance that the family will move out of the current census tract. This project is only concerned with when a household leaves a neighborhood, not where they locate next or if it is even in the same city or metro. Therefore, this variable is picking up regional economic divergence as some working-class households leave a “cool market” metro for a superstar region

with more job opportunities. This relationship supports other regional economic divergence theories and evidence and should be considered a key aspect of measuring disinvestment-induced displacement (Manduca, 2019). Furthermore, this finding highlights how "disinvestment" variables can be at different levels and are not just acting at neighborhood scales but at the metro or regional scales as well. The depressed metro home values are measuring disinvestment at the regional scale.

Before getting to what stood out in the second phase of analysis, the multicollinearity questions should be further examined before taking these Phase 1 results at face value. Table 10 includes the VIF scores and 1/VIF scores for each variable included in any phase 1 model (including mobility intentions robustness). Multicollinearity is a real concern when you have such close relationships between variables, as is the case here with various disinvestment factors and neighborhood change factors in the same model. Fortunately, it appears the steps taken to curb multicollinearity have worked as the mean VIF is below 2 and there are no variables with a VIF over five. VIFs of 10 or higher are often considered the threshold for multi-collinearity.

Table 10. Phase 1 VIFs

Variable	**VIF**	**1/VIF**
High Vacancy 2011 - 2014 (4% to 9.99%)	1.28	0.7839
Very High Vacancy 2011 - 2014 (10% to 19.9%)	1.14	0.8763
Hypervacancy 2011 - 2014 (20% or more)	1.01	0.9885
Percent Change in Home Value 2011 - 2014	1.68	0.5969
Some Residential Investment 2014 ($500K to $999K)	1.09	0.9596

Table 10. (continued).

Little to No Residential Investment 2014 ($0 to $499K)	1.04	0.9643
Total School Closures in Tract from 2011 to 2014	1.04	0.8724
Family Size	1.15	0.9079
Families in a Duplex	1.1	0.5995
Families in an Apartment	1.53	0.8646
Families Do Not Own Home	1.67	0.9579
Family is Definitely or Probably Moving Soon	1.22	0.4410
Family is Uncertain of Mobility Intentions	1.11	0.6051
Family Head - Black	1.86	0.5376
Family Head - Asian	1.03	0.9669
Family Head - Hispanic	1.24	0.8069
Family Income	1.18	0.3719
Recent Job-Related Exit (0,1) [3]	1.04	0.5795
Proportion of Neighborhood Black	1.81	0.9700
Proportion of Neighborhood Asian	1.41	0.9719
Proportion of Neighborhood Hispanic	2.27	0.2826
Proportion of Neighborhood Commuting 30+ minutes	1.65	0.2632
Proportion of Neighborhood that Rents	2.67	0.7839
Neighborhood Median Household Income	3.86	0.8763

Table 10. (continued).

Proportion of Neighborhood with Pro/Tech Jobs	2.69	0.9885
Neighborhood Population Density Per Square Mile	1.73	0.5969
Median Age of Building in Neighborhood	1.03	0.9596
MSA Population Change (2011 – 2015)	1.03	0.9643
MSA Median Home Value	3.54	0.8724
MSA Median Household Income	3.8	0.9079
Mean VIF	1.58	

N = 1,339

Phase 2 Regression Results

On the following page, you will find Table 11 which summarizes the regression results for models with metro fixed effects. These models also included a spatial fixed effects dummy variable indicating the metro area of the family. These 201 fixed effect variables are not included in the table and were in the model to catch any other unmeasurable impact occurring in the metropolitan area. Since Phase 1 only included three metro variables, Phase 2 ensures the key findings do not change when we control for other unobservable regional economic dynamics. Furthermore, the predictive power of these models is present but not as high as you might expect, particularly given the fixed effects nature of the analysis. Oftentimes with fixed effect models, one trades off predictive power (higher r-squares) for less statistical power of independent variables (Allison, 2009).

The results for Phase 2 play out as one would expect. R-Squares are higher throughout all four models, and less variables are significant. Aside from hypervacancy, school closures are the only other disinvestment variable to be significant. Some of the findings around residential investment and very high vacancy are still important but might be impacted by regional economic forces, which is what previous research has shown when it comes to institutional, residential investment (Charles, 2020). Hypervacancy stays significant at the highest level throughout this phase. School closure only comes in at the lowest level during robustness check, bringing into question its Phase 1 results as well and suggesting a regional economic influence here too.

Per the outlined methodology from dissertation, all these results, especially the statistically significant ones, were checked for further robustness in two ways. One was by performing the same models in a binary logit regression. Secondly, the largest cities were removed (i.e., New York City, Los Angeles, Chicago) to ensure they weren't influencing the model. The direction of the results remains the same.

Unfortunately, this dataset was not detailed and large enough, compared to the PSID data, to really illustrate something firm. There is evidence, however, supporting the tension between lowering crime as a displacement pressure from a gentrification standpoint and raising crime as a potential displacement pressure from a disinvestment standpoint, deserves much more analysis.

Table 11. Phase 2 Regression Results, Estimation of Family Exiting Neighborhood, 2015 – 2017 for PSID Households <100% AMI

	Model 1				*Model 2*			
	Coeff	*p-val*	*Betas*	*SE**	*Coeff*	*p-val*	*Betas*	*SE**
High Vacancy 2011 - 2014 (4% - 9.99%)	-0.0086	0.776	-0.0081	0.0302	-0.0068	0.816	-0.0064	0.0292
Very High Vacancy 2011 - 2014 (10% - 19.99%)	*-0.1137*	*0.097*	*-0.0422*	*0.0684*	-0.0938	0.140	-0.0348	0.0635
Hypervacancy 2011 - 2014 (20%+)	***0.7794***	***0.000***	***0.0600***	***0.0748***	***0.8709***	***0.000***	***0.0670***	***0.0723***
Percent Change in Home Value 2011 - 2014	-0.0007	0.236	-0.0572	0.0006	-0.0006	0.224	-0.0555	0.0005
Some Residential Investment 2014 ($500K - $999K)	0.1608	0.104	0.0483	0.0988	*0.1595*	*0.074*	*0.0479*	*0.0893*
Little to No Residential Investment 2014 ($0-$499K)	-0.0896	0.259	-0.0168	0.0793	-0.0409	0.619	-0.0077	0.0823
Total School Closures in Tract from 2011 to 2014	-0.0271	0.261	-0.0272	0.0241	-0.0284	0.243	-0.0285	0.0243
Family Size	0.0120	0.153	0.0381	0.0084	0.0047	0.568	0.0150	0.0083
Family in a Duplex	-0.0121	0.825	-0.0059	0.0549	-0.0300	0.569	-0.0145	0.0527
Family in an Apartment	**0.0776**	**0.030**	**0.0758**	**0.0357**	**0.0814**	**0.019**	**0.0795**	**0.0346**
Total Family Rent ($100s)	**-0.0002**	**0.045**	**-0.0545**	**0.0099**	**-0.0020**	**0.026**	**-0.0375**	**0.0009**
Family Does Not Own Home	***0.2829***	***0.000***	***0.3029***	***0.0279***	***0.1816***	***0.000***	***0.1945***	***0.0301***
Total Family Income ($1000s)	0.0007	0.230	0.0307	0.0054	0.0000	0.240	0.0233	0.0052
Family Head - Black	-0.1578	0.669	-0.0170	0.0369	-0.0343	0.333	-0.0370	0.0354
Family Head - Asian	-0.1184	0.368	-0.0213	0.1499	-0.1184	0.402	-0.0164	0.1000

Table 11. (continued).

Family Head - Hispanic	-0.9846	0.209	-0.0391	0.0787	-0.0985	0.156	-0.0294	0.0694
Recent Job-Related Exit	0.0733	0.344	0.0286	0.0775	0.0239	0.755	0.0093	0.0764
Proportion of Neighborhood Black	0.0004	0.620	0.0203	0.0007	-0.0002	0.735	-0.0138	0.0007
Proportion of Neighborhood Asian	0.0034	0.213	0.0436	0.0027	0.0035	0.180	0.0453	0.0026
Proportion of Neighborhood Hispanic	0.0013	0.317	0.0588	0.0013	0.0011	0.370	0.0511	0.0012
Proportion of Neighborhood Commuting 30+min	-0.0018	0.117	-0.0636	0.0011	-0.0014	0.209	-0.0500	0.0011
Proportion of Neighborhood that Rents (2014)	0.0001	0.932	0.0036	0.0011	-0.0005	0.643	-0.0188	0.0010
Neighborhood Median Household Income ($1000s)	0.0003	0.789	0.0141	0.0012	0.0003	0.783	-0.0362	0.0011
Proportion of Neighborhood with Prof/Tech Jobs	-0.0005	0.739	-0.0145	0.0015	0.0000	0.979	0.0011	0.0015
Neighborhood Population Density Per Square Mile	9.7410	0.274	0.0428	8.9021	9.2984	0.284	0.0409	8.6830
Median Age of Building in Neighborhood	-0.0004	0.742	-0.0071	0.0001	0.0000	0.886	0.0030	0.0001
Family is Definitely or Probably Moving Soon					***0.2520***	***0.000***	***0.2025***	***0.0396***
Family is Uncertain of Mobility Intentions					0.0536	0.230	0.0319	0.0446
N = 1,399								
R-square	0.2893				0.3398			

Notes: *Clustered (at census tract), robust standard errors; Includes 201 MSA Fixed Effects dummy variables, not report; Bold and italicized = significant < 0.01; bold = significant < 0.05; italicized = significant < 0.10; “Disinvestment” Variables Bolded

Discussion and Future Research

The goal of this paper was to build from previous research to find a variety of disinvestment variables to throw against the proverbial wall to see which ones maybe led to a household being directly or indirectly forced to leave the neighborhood. Essay 1 discussed the micro-mobility data challenges common in displacement research and the limitations placed on rigorous neighborhood change and mobility research. This research was not immune from those challenges, and finding complete tract disinvestment data on all key disinvestment variables that overlapped with PSID sample, led to a smaller sample size that might have influenced some of the statistical significance of key variables. Still, the research provides numerous key findings, and this conclusion will begin with further acknowledging the limitations to keep in mind, before discussing key takeaways and future research.

Limitations

The limitations here are substantial, and this list is not exhaustive. First, the PSID survey size, while large, is known to be less representative of urban areas and communities of color (Dantzler & Rivera, 2019). As a result, these data do not tell the whole story of entire cities or neighborhoods, which could result in some potential noise in the results. These representation concerns are compounded given the way the sample size for this study was constructed. Not only did the sample consist strictly of households who reported making less total income than the area median (<100% AMI), but the sample also required matchable neighborhood disinvestment variables. For these two reasons, the results here should not be overstated and should be discussed strictly within the context of its exploratory scope. Second, the brief study is occurring during an odd time in the U.S. housing market, when cities are recovering from the subprime

mortgage crisis and foreclosure fallout that ensued, undoubtedly impacting all cities to varying extents (Immergluck, 2011). The recovery period also was not equal or homogenous by any accounts, meaning that some cities, especially those hit hardest by the subprime mortgage crisis, will have certain events and actions it would be statistically impossible to control (Raymond, 2018). Third, there are some aspects of disinvestment, such as neighborhood efficacy or rental instability, where no complete national datasets are available at the neighborhood level. These are priority areas for future research, perhaps at the city level, to see how these important neighborhood indicators interact with household exits, but the numerous variables herein should be more than enough to start the conversation. Fourth, the small Ns, could be limiting statistical accuracy here and there may be some sampling bias at play in this exploratory research project. Fifth and finally, there is clearly a role that family income is playing in these analyses. While the models do control for autonomous moves, family income, neighborhood professions, and more, breaking out the analysis (if the N is large enough) by certain low-income or high-income groups would be a clear next step and is key limitation of this study.

Key Takeaways

Despite these limitations, the research produces at least three key takeaways that together constitute a meaningful contribution to the growing literature on disinvestment and displacement.

Chief among these contributions is the role of the hypervacancy threshold. The fact that once a neighborhood sees more than 20% vacancy the likelihood of a household exit increase by over 50% is very telling. It also could support Marcuse's (1985) "last resident" resident displacement, but of course that depends on when you define a household is one of or the last resident on a block or in a community. Marcuse's (1985) operationalization of that term in 1980s

NYC is different than how one might consider applying that term to 2022 American cities. Regardless of operationalization, severe vacancy, which research has shown is stagnant in some of the U.S.'s most populous regions (i.e., Sun Belt and Rust Belt), is leading to displacement. After all, what clearer sign could a family have that their place is no longer a place you want to be, than seeing at least one out of every five buildings in their neighborhood sit vacant for long periods of time.

One potential interpretation of these results is not the methodological or data shortcomings caused these results, but instead neighborhood indicators (much like the ones used in this research) are not the best way of measuring householder mobility decisions. One might say, a householder cannot avoid the signals measured by a neighborhood indicator. Recent research, however, pushes back against that idea and points to the perceptions those indicators create as better measures of neighborhood trajectory from the eyes of residents (Jones & Dantzler, 2021). If perceptions are a better benchmark, then maybe the mixed findings in this essay, is further evidence that perceptions, not indicators, are a better measure of all neighborhood change.

Finally, metropolitan-level home values clearly play a role in all of this as well. Declining home values observe at the metro level are connected to a variety of other regional economic and political forces as described in the disinvestment literature (Mallach, 2018a; Hackworth, 2019). Regional economic divergence and its impact on neighborhood-level changes is not receiving the attention it deserves and this research is further proof that it warrants a much closer look.

Future Research

The contributions in this essay are a great starting point to accompany the other recent research on other versions of neighborhood displacement, not named gentrification (Seymour & Akers, 2022; Sims, 2021). Further, it is one of the first studies (to this author's knowledge) that situates key aspects of disinvestment as the focal driving force for displacement.

From this explorative starting point, where else could this line of inquiry go? First, a firmer conceptualization of DID is necessary. What would a working concept model of DID look like? Secondly, with a better idea of DID and by using these results, it would be possible to start estimating the extent of the problem in medium to large metro areas. This analysis should include neighborhood-level variables like hypervacancy but also metro home values as well since both are "disinvestment" measurements just at differing geographic scales.

Lastly, the question of perceptions versus indicators necessitates further research, especially in the context of displacement. Using more qualitative research methods, maybe even targeted in a specific city or neighborhood, one could even compare some perception surveys and their impact on mobility, with administrative data or similar quantitative measures of neighborhood conditions. Which predicts displacement better? Which predicts disinvestment-induced-displacement better?

Vacancy is ever-present in many urban American areas, and regional economic forces are causing certain metros to have lower home values than "superstar" regions (Mallach, 2018a, Manduca, 2019). If there is any possibility that it too might drive displacement, which these results suggest there is, then DID needs to start getting much more attention than it has so far. By doing so, researchers can disrupt the "gentrify or die" paradigm and begin carving a place for community-driven development.

ESSAY 3: CONCEPTUALIZING & MEASURING DISINVESTMENT-INDUCED-DISPLACEMENT (DID) AND ITS SPATIAL IMPLICATIONS

In recent decades, urban researchers have focused heavily on the concentrated reinvestment in previously disinvested neighborhoods (Patch et al., 2017; Ehrenalt, 2013). For the most part, this fixation has been focused on the impacts of these renewed investments on existing residents, particularly the likelihood for this investment to lead to their displacement (Hwang & Lin, 2016). In other words, does this process of improving an area for wealthier in-movers, a process dubbed gentrification, lead to displacement (Freeman, 2005; Glass, 1964)?

Unfortunately, this question and our understandings of gentrification have sometimes morphed in unproductive ways that have not only made the question harder to answer but have even made it harder to discuss other types of neighborhood change (Axel-Lute, 2019). Without talking about much else besides gentrification, it has been challenging to center discussions around community-driven development or other more intentional ways to invest in racially and systemically disinvested spaces. Much of this issue is due to how rigorous research has produced two dichotomous (often considered mutually exclusive) understandings of urban neighborhood trajectories, a dichotomy I call “gentrify or die.” Let me explain.

Since the creation of the neighborhood as an independent concept, the only constant element of neighborhoods is the fact neighborhoods never remain stable and are always changing (Mumford, 1954; Burgess, 1928). Reflecting on British New Towns, Garden Cities, and the beginning of neighborhood planning, the idea of the neighborhood was borne out of change and created in response to urbanization in 19th Century English cities (Howard, 1898). Therefore, it should come as no surprise that American urban researchers have highlighted neighborhood change in urban environments for over a century, especially concerning another concept: race

(Du Bois, 1899; Park, 1915). The ontological realities of urban environments led some of these same early urban researchers to propose hard-science analogs to what they were seeing in urban neighborhoods, bringing about a field of urban research called “human ecology” made famous by the early 20th century Chicago School (Park, 1915; Burgess, 1928; Wirth, 1938).

The background on neighborhoods and human ecology are essential to discuss how neighborhoods became an independent unit of observation constantly linked with processes of change. Furthermore, the early ideas of human ecology and its implicit inevitability project a sense of certainty that is especially pertinent when we apply this conversation to contemporary discussions of another English concept: gentrification (Glass, 1964). Before the media sensationalized "the g-word," catapulting it into zeitgeisty infamy with more definitions than one can keep track of, many prominent urban thought leaders drew direct lines between gentrification as a process to other human ecological ideas such as invasion and succession (Patch et al., 2017; Freeman, 2005). The importance of these connections is punctuated in the context of other related human ecological understandings, such as neighborhood life cycle theory, inevitable decline, or urban triage (Marcuse et al., 1982; Metzger, 2000). These theories are often associated with the “die” portion of the “gentrify or die.” It is as if many urban neighborhoods are left with two realities: either they gentrify or they continue their decline until the last resident and ultimately “die” (Marcuse, 1985; Hackworth, 2019).

Given the fact that disinvestment and gentrification are often discussed as *the* two binary trajectories of all urban neighborhoods, one would assume research and theories that connect these two concepts are relatively common and well discussed. But as Essay 1 of this dissertation showed, that is not the case. Furthermore, only limited recent research seeks to take the connection further and see in what ways decline influences displacement as well. There are many

ways a place can change, and space needs to be created to build out other conceptualizations of neighborhood displacement.

Research Aims

So far in the dissertation, I have examined the limited previous research connecting displacement and disinvestment and analyzed the specific disinvestment-related actions, processes, and events that contribute the most to the probability of a household leaving their neighborhood. This final core essay in this dissertation will take the statistically significant variables in Essay 2 and use them to form a composite index to operationalize the phenomenon I call disinvestment-induced-displacement (DID). In addition to the creation of this DID index, a complete conceptual framework for DID will also be presented and discussed. But first, it is important to explain why DID matters and how a stronger conceptualization could help urban change agents better measure this phenomenon.

In short, the purpose of this paper is to disrupt this "gentrify or die" paradigm in hopes of carving out space to discuss community-driven development. The "gentrify or die" way of thinking tended to manifest itself in a version of the following. Community development corporation X would want to do Y intervention, be it a public art installation, community garden, farmers' markets, or something similar. Even if the proposed project was not a large-scale mixed-use development or another project commonly associated with gentrification pressures, the shadow of gentrification still loomed largely. It should go without saying, these concerns are valid and rooted in decades of an imbalanced, racialized political economy and deserve to be treated as such, but this overemphasis on one type of neighborhood change is a real barrier to incremental community-driven change.

Research Question

With little to no prior research on disinvestment and its impact on displacement, this essay hopes to lay the groundwork for future research by proposing an initial foundational study. This essay poses the following questions:

1) What is disinvestment-induced displacement?
2) How can DID be measured in a replicable manner?
3) To what extent is DID present across U.S. metros?

Answers to these questions could add necessary nuance to the neighborhood change discussion and provides space to begin discussions around interventions that promote development without displacement.

The first question is arguably the most important. Gentrification was conceptualized in the mid-1960s, and while its recent popularity has made it harder to understand, there is no shortage of definitions and conceptualizations of "the g-word" (Hwang & Lin, 2016; Patch et al., 2017). There is, however, virtually no conceptualization of DID, and the closest attempts were discussing certain aspects of DID, such as the Marcusian (1985) concepts of "last resident displacement" or "chain displacement." These terms describe more specific byproducts of decline and abandonment contributing to displacement, as will be discussed in the following section.

The paper will start by building from relevant theory and the previous essays in this project. First, the term DID will be conceptualized through a working framework that will help form a more elicit definition. This new definition and conceptualization will allow urban scholars to situate DID within the broader understanding of neighborhood change, its stages, and its impact.

The second research question hopes to produce a *replicable* way, using *publicly available* data, to measure and track DID at the neighborhood (census tract) level. Extra emphasis is added to both "replicable" and "publicly available" because these are two oft-cited problems with the growth of gentrification as a concept and measurable phenomenon. For one, since gentrification has various definitions and understandings, it too has various methodologies of measurement. There are "gentrification pressures" you can measure, or types of displacement often linked to gentrification, such as cultural and political displacement, that are measurable to varying extents. With a term influenced by academics, the replicability of these measures varies greatly.

A replicable measure relies on readily available data, another challenging part of neighborhood displacement research. Due to individual privacy concerns, it is difficult to access data on mobility and even harder to access micro-level data such as inter-neighborhood mobility. As evident and discussed in Essay 2 of this dissertation, inter-neighborhood mobility info often requires special permission. Though these data were used to determine the variables needed to construct the DID index, the replicability of measurement is built on readily available data.

As a result, these publicly available census tract-level data open the possibilities of mapping DID evidence for the first time using geospatial analysis. Performing this analysis allows for a more nuanced understanding of the role of disinvestment in reshaping urban neighborhoods. Moreover, this essay seeks to understand where and to what extent these factors contribute to DID and complimentary factors across different types of neighborhoods with higher rates of DID.

Outlining the Rest of the Essay

Before answering these three key questions first, a deeper discussion around the types of neighborhood displacement drivers is necessary. Then, the first research question will be answered as this section of the essay will define and conceptualize DID while also discussing the ways it relates to other types of neighborhood displacement drivers. Next, the DID composite index's methodology will be detailed, as well as the validation of the term and other variables to test for inclusion in the DID index as this research around this topic grows. Lastly, the spatial extent of DID in medium and large metros will be mapped, as well as metros with the highest rates of DID according to the index. These metro-specific maps will uncover the types of neighborhoods across large and medium-sized cities with relatively higher rates of DID. The essay will conclude with a discussion of findings and call for future research.

Background on Neighborhood Displacement Factors

To discuss the pertinent background on what factors are associated with neighborhood displacement, it might first help to define what this essay means when it says neighborhood displacement. This project defines neighborhood displacement as the exiting of residents from a neighborhood due to direct or indirect forces, processes, events, or actions that heavily encourage or force their exit. This definition is like those used in some gentrification literature examining displacement and results in a similar outcome, a household leaving the neighborhood (Freeman, 2005; Lee & Evans, 2020).

When defining any term, but particularly a term as nuanced and oft misunderstood as neighborhood displacement, it can be helpful to mention what neighborhood displacement is *not*. More specifically, this project is concerned with what factors are directly or indirectly associated

with a household exiting a neighborhood and not the changes in certain aspects of a neighborhood. This project acknowledges four other types of displacement based on previous research that are distinctly not the focus of this research. One is physical displacement, or the forced move following the demolition and/or planned redevelopment of a specific site or community (Lopez & Greenlee, 2016). The second is cultural displacement, a less tangible form of displacement that describes the way a change in the neighborhood impacts cultural assets, commercial choices, or power to define the cultural elements of a specific community (Zukin, 1987). Thirdly is political displacement, or the loss of power at the neighborhood level where in movers take control of neighborhood associations and other civic associations from long-term residents (Hyra, 2015). And fourth and finally, exclusionary displacement, or when rents or prices go up to the point where it prevents working-class in-moves (Sims & Sarmiento, 2019). Most of these definitions are derived primarily from research on potential gentrification-induced displacement.

Gentrification is unquestionably the most researched and discussed driver of displacement, but it was not always that way, of course. An early 1960s British sociologist, Ruth Glass (1964), coined "gentrification" to describe the change she saw in London, as the "gentry," or the upper class, moved into parts of London, subsequently displacing the working class. The term, though present in the 1960s, 70s, and 80s, really did not become an oft-discussed topic until the 1990s, particularly amongst critical geographers and human geographers (Smith, 1996). Theories and concepts of uneven development, which accentuated the market realities of the Western World's commodification of housing, complimented gentrification as a process. Uneven development patterns lead to wealthier and, in America, often (but not always), larger proportions of white groups moving into a neighborhood at a scale that drives up the cost of

living and makes it harder for low to moderate-income households of color to continue living there (Harvey, 2005; Smith, 2010). This paper will use Glass's (1964) definition that notably does not include race but rather foregrounds economic differences and bounds gentrification as a process by which wealthier residents move into a neighborhood at a scale that meaningfully impacts the cost of living more broadly (Glass, 1964). It should be noted that there is an unquestionable racial component to all aspects of this essay since class and race are so intertwined in the American context, especially regarding processes such as dispossession and displacement (Dantzler, 2021).

While the literature has gone back and forth on this question of whether gentrification causes displacement, it is becoming clearer that in many cases, a certain level of appreciation pressure contributes to a household leaving a neighborhood (Freeman, 2005; Chapple & Zuk, 2015; Ding et al., 2016). It often drives displacement as an area becomes more desirable but is it the improvement of the area or the change in preferences that are really driving it? When just examining the supply-demand relationship solely in the context of gentrification, it can be tough to identify the empirical causation of one category of concepts and processes over the other. By examining the counterfactual, when demand leaves and supply is slower to follow, it becomes clearer that demand is the prevailing force here. The reason is the enduring power of individual agency. Individuals see neighborhoods and places in clearer terms while still clouded by some of the crude geographies of those growth machine actors seeing the city through maps and bar graphs; the lines on those maps and the x and y variables in those bar graphs are all shaped by what they think their potential customers, voters, or tenants desire. We need not give our city's elite actors too much credit; even if they may think they can manifest demand, the literature says otherwise (Ellen et al., 2019; Freeman, 2011; Ehrenhault, 2013).

So other than demand increasing in a targeted space through a process many refer to as gentrification, what are other drivers of displacement? As discussed, the literature is relatively silent on this front since gentrification has absorbed much of the oxygen in this battle, especially over the last 20 or 30 years. If one goes back further to the mid-80s, a seminal piece can be found that is the most comprehensive discussion of displacement drivers that do not start with the letter "g" (Marcuse, 1985).

This piece originates from 1980s New York City research, where abandonment and gentrification pressures were apparent simultaneously. A critical geographer used what he observed to discuss the double-edged sword of neighborhood change (Marcuse, 1985). Specifically, this paper discussed the various displacement pressures caused by both appreciation and depreciation at varying scales using late 70s and early 80s New York City as his case study to observe this dichotomy. In the piece, Marcuse (1985) discusses four different types of displacement. The first two primarily relate to disinvestment or decline: "last-resident" and "chain" displacement. The last resident is self-explanatory. This is in areas that have experienced significant abandonment, and lower-income households are often the last to leave due to fewer alternatives or lower levels of resources to perform a voluntary move. Chain displacement is more precarious and relates to slightly higher-income households who leave dwellings that are not yet abandoned. For Marcuse (1985), displacement is conceptualized at a unit-by-unit scale, and you can have different processes of displacement occurring in the same place at the same time. For example, Marcuse (1985) argues that chain and last-resident displacement often happen alongside each other in declining neighborhoods. The other two versions are more associated with gentrification: exclusionary displacement, one of the types of displacement named earlier,

and displacement pressures, which are early warning signs of exclusionary displacement (Marcuse, 1985).

Marcuse is writing in the wake of recent well-publicized planned abandonment projects and urban triage strategies in New York City. Therefore, his piece also makes a connection between the temporal nature of abandonment and gentrification (Marcuse, 1985; Wallace & Wallace, 1990). There is no discussion of gentrification in wealthy, affluent areas that have seen steady investment for extended periods of time. Therefore, it is worth plainly stating that there is no discussion of an "R" word, such as reinvestment, redevelopment, or renewal, without the area first going through a cycle of "D" words, such as disinvestment, deterioration, or decline. To take this thinking an inch further, it may be worth exploring how the intentionality of disinvestment could be the earliest warning sign of potential displacement drivers. NCLT and planned shrinkage have a clear connotation that with fewer existing residents, it's easier to redevelop that space (Hackworth, 2015). This working linkage and additional driver of displacement is not as discussed in the research, given that "disinvestment" and "displacement" are often exclusively discussed.

Conceptualizing DID

One key purpose of this third and final essay is to build on previous neighborhood displacement research, specifically research that focuses on abandonment and decline, to create a definition of disinvestment-induced-displacement (DID). Then, the results from the regressions in Essay 2 that were significant will be used to create a meaningful conceptual framework of DID. This research is leaning on Essay 2 since there is so little other research that seeks to distinguish which disinvesting forces impact displacement the most. In the last year or two, a few

pieces of relevant research have expanded this nascent research agenda, and this part of the essay will conclude by discussing their potential inclusion in an evolving conceptualization of DID (Seymour & Akers, 2022; Snidal et al., 2022).

It is best to define DID in a way that is undergirded by previous research, specifically Marcuse's conceptualizations of neighborhood displacement. Marcuse (1985) lays out four key criteria of neighborhood displacement:

1) "It is beyond the household's reasonable ability to control or prevent.
2) (it) occurs despite the household's being able to meet all previously imposed conditions of occupancy.
3) (it) differs significantly and in a spatially concentrated fashion from changes in the housing market as a whole; and
4) (it) makes occupancy by that household impossible, hazardous, or unaffordable." (Marcuse, 1985, p. 207).

Building from the above, DID is defined as *a spatially concentrated neighborhood change process that makes residing in that area unreasonable or hazardous in ways that are beyond the household's control*. It is important to situate private property owners, the state, and other actors that are in control of neighborhood processes. DID does not subsume *everyone's* agency or responsibility in the process, and it certainly does not situate DID as a "natural" or inevitable process. The households that are living the realities of DID often have little control over these larger neighborhood change forces aside from their mobility decisions, as mentioned earlier. Therefore, the way the urban studies field defines DID intentionally situates resident self-

determinism at the heart of the "solution" to DID since it is the household's lack of agency that is a key driver of the problem (Gilmore, 2008).

Figure 2. Concept Model for Disinvestment-Induced-Displacement

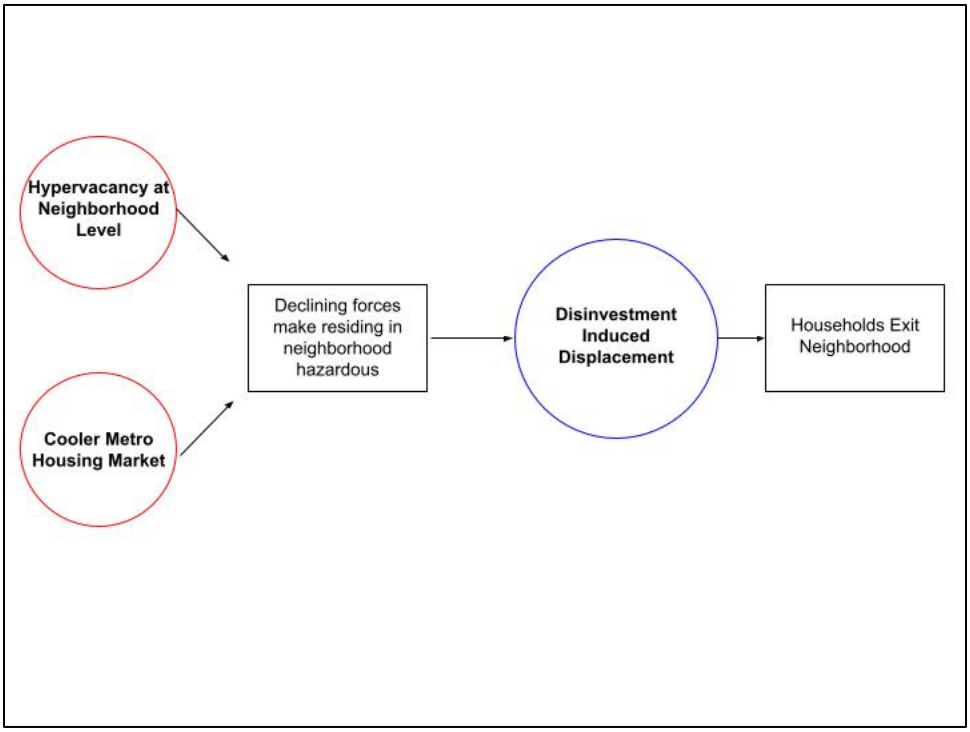


Figure 2 above complements this definition and further explains what DID looks like conceptually. In Essay 2, there was one driver out of the four tested that showed signs of impacting a household's decision to leave a neighborhood: hypervacancy. Furthermore, metro area home value also had a negative statistically significant impact meaning a cooler metro market also impacts household exits. This latter finding expands on existing understandings of divergent metro regions and the ways the metro economic demand related to neighborhood change (Manduca, 2019; Mallach, 2018a). These forces, among many others, have both been shown to make communities hazardous or unreasonable to live in. Hypervacancy has been

connected to health concerns, elevated stress levels, and a wide variety of public safety challenges (Wang & Immergluck, 2018; Branas et al., 2012; Mallach, 2018b).

The way Figure 2 lays out the concept model starts with these driving forces that contribute to the broader trend of decline or abandonment that makes residing in the place hazardous or unreasonable, which is DID the process and can lead to an outcome of household exits.

This research acknowledges its exploratory nature. Therefore, Figure 2 is strictly a starting point, not an endpoint. Moreover, other recent research has proposed that in addition to speculative investment and hypervacancy, foreclosures, and evictions are shown to increase displacement in declining contexts as well (Seymour & Akers, 2022; Snidal et al., 2022; Sims & Iverson, 2021). Future conceptualizations of this term should look to include foreclosures, both municipal and private, and different aspects of the "eviction economy" that disadvantage existing residents in communities experiencing variations of decline (Seymour & Akers, 2021).

The definition and conceptualizations herein foreground ways real property actors influence and exploit regional market dynamics and contribute to conditions of a place that tell a reasonable household: this place is not where you want to be anymore. While sending that message, many of these same actors situate themselves to benefit the most once some of the neighborhood "disamenities" take care of themselves and the area is prepared for a potential, more affluent in-movers (Ellen et al., 2019). Since this intentional disinvestment is so critical to an area's quality of life, developing a way to measure it will be key to influencing anti-displacement policy and building out tools that combat various aspects of neighborhood displacement.

DID Index

The second part of the essay will further conceptualize the term with a better understanding of the factors that contribute to DID to begin approximating the extent to which DID is present in all U.S. cities. The conceptual framework will be operationalized with a multi-variate construct. The reasoning and logic behind choosing this methodology will be discussed before the details of the methods, the validation process, and future ways to incorporate other relevant variables are all also detailed herein.

Index Methodology

There are many ways to form a latent construct, as detailed in the urban social sciences. Before beginning this essay's analysis, there were three "front runners" for the DID index methodology. There is a factor analysis that takes the common variance of a larger set of variables and points to a smaller number of variables that quantify the most influential factors in the latent process you are seeking to measure (Kim et al., 1978). Often grouped closely with factor analysis and seen as a similar technique is principal component analysis (PCA). PCA looks for a single "component" or a derived variable that explains the greatest variance in a set of larger variables seeking to measure a latent process. Unfortunately, both options require a starting point of numerous variables that are then distilled into one or two. For these purposes, there are already just two variables that will go into creating this construct, so factor or PCA is less applicable since they both require a substantial variable count as a starting point.

As a result, the third option ends up being the chosen methodology: a composite index. A composite index is one of the most popular multivariate constructs and can take different shapes and approaches. So, as a starting point, this analysis focused on a similar existing index that

could be modified to measure DID. The Townsend Deprivation Index was created by Prof. Peter Townsend in his research in London, England (Townsend, 1987). The indices are constructed of four variables readily available in census data, both in the U.K. and the U.S. The four variables are 1) households without a car, 2) overcrowded households, 3) households not owner-occupied, and 4) persons unemployed. The resulting index has been used for decades in research across the globe to measure social "deprivation" in a variety of social science disciplines (Rees et al., 2002).

The process for calculating the index begins with normalizing the variables by taking the log of each. Then calculate a z-score of the log and add the z-scores together for all four variables to get your final index score. For this research, the exact methodology was relatively easy to adapt for this purpose.

Table 12 below shows the adapted methodology, taking the Townsend Deprivation Index and applying it to our two key disinvestment variables. As mentioned in Essay 2, the metro home value's negative relationship indicates that the lower the median home value is at the metro level, the more likely a family is to leave a neighborhood. This relationship situates the metro variable as a "disinvestment" variable.

Steps 1 and 2 replicate the exact initial steps from Townsend using the vacancy variable. For this variable, the highest amount of vacancy (hypervacancy) is most influential in encouraging residents to leave their neighborhood. The log of the 2011-2014 long-term vacancy rate is used to create a z-score. Then the z-score of long-term vacancy is added to the log of the metro home value variable. To account for metro home value's negative relationship, the lower the home value needs to receive, the higher the DID score. Therefore, step 3 includes reversing the sign and giving a higher score to tracts in metros with lower home values relative to the rest

of the U.S. The higher the score (highest tract in study sample = 4.72), the more evidence of DID there is in this community. The lower the score (lowest tract in study sample = -7.90), the less evidence there is for DID.

Table 12. DID Index Methodology Table.

Steps to Calculating Neighborhood DID Index Scores
Step 1 → Normalize (Log) 2011 - 2014 long-term vacancy average and MSA Median Home Value at the census tract level
Step 2 → Calculate Z-Score of long-term vacancy and MSA Median Home Value
Step 3 → Reverse the sign of MSA Median Home Value, so lower values give higher DID scores
Step 4 → Add up the z-scores to get the DID Index Score. Higher, positive values indicate a high presence of DID. Negative scores indicate low/no presence of DID.

Validating the DID Index

The Cronbach's Alpha was calculated using both variables (residential investment and vacancy) to validate the DID index for robustness and accuracy. Cronbach's Alpha is a commonly used way to determine the validity of a multi-variate construct (Lewis-Beck et al., 2003). An alpha that is greater than 0.7 is considered a robust measure. These two variables had an alpha greater than 0.7 (0.734), verifying the validity of these measures. The summary statistics for the index results are found in Table 13 below.

Table 13. DID Index Summary Statistics.

Mean	Std. Dev	Min	Max
-0.513	1.824	-7.904	4.723

Other Variables to Consider

As mentioned in the conceptualization of the term, recent research is pointing to other aspects of decline that have potentially displacing characteristics at the neighborhood level. Both municipal and private foreclosures were shown to have displacing impacts, as were evictions in certain situations (Seymour & Akers, 2022; Snidal et al., 2022; Sims & Iverson, 2021). These variables were omitted from the current conceptualization for data limitations. On the foreclosure side, there is no nationally representative database for estimating foreclosure rates, making it impossible to operationalize that variable in this national study. For evictions, there have been attempts to create a national eviction database, i.e., Princeton's Eviction Lab. However, a large part of the country is excluded, and there have been valid critiques of data validity, especially across states, even in areas where there is eviction data (Aiello et al., August 22, 2018). Future research, especially research that looks at city-specific displacing forces, would be wise to include all types of foreclosures and evictions.

Extent of DID in Top 200 U.S. Metros

With the DID Index scores in hand, it is now possible to estimate the extent to which DID is occurring in larger U.S. metropolitan areas. Each tract that receives a DID Index score can now be analyzed spatially. Specifically, there are two different phases to the exploratory spatial analysis. The first phase will focus on the national level and map the Top 200 MSAs by the

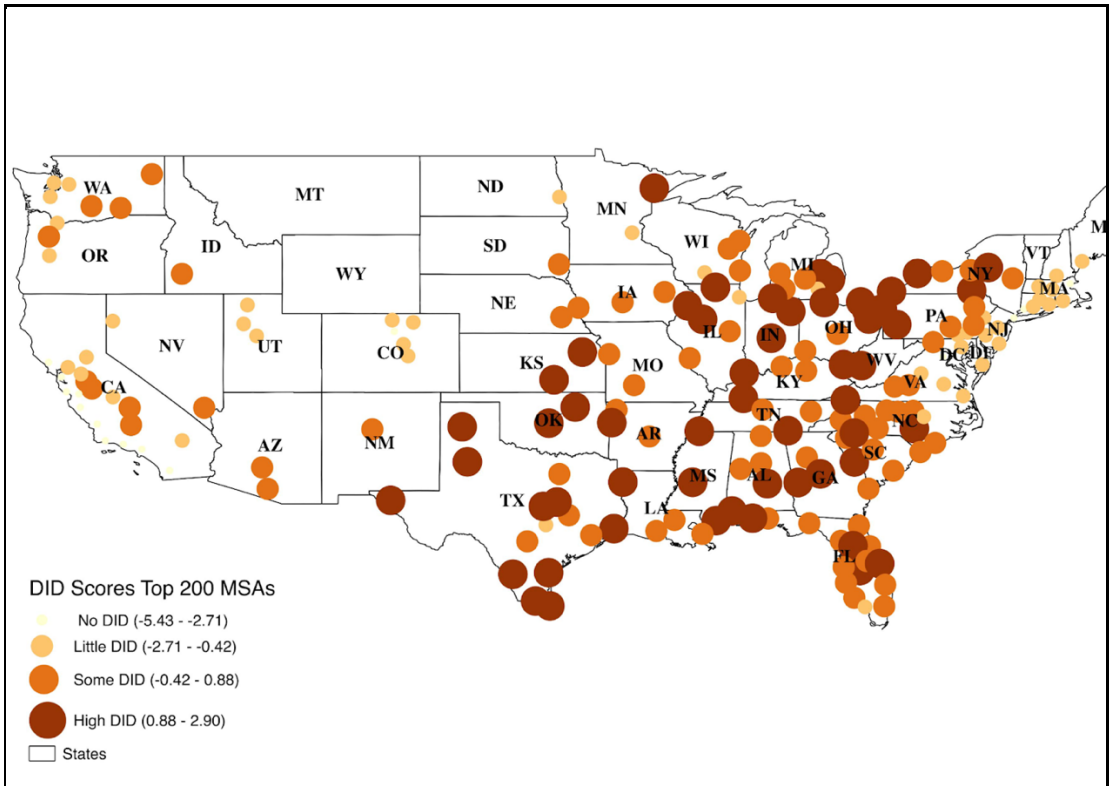
average DID index score for the MSA. The cut-off points for each level of DID evidence were determined by the distribution of the tract DID scores and the natural breaks for each average. This required creating a histogram for the DID index score for each tract in the U.S. with complete data. From there, I use Jenks natural breaks classifications to group index scores into "natural" groupings. These natural groups are designed to reduce the average variance within groups but increase variance between groups. MSAs were chosen over cities as the unit of analysis here since many regional market forces act at the metro area (Manduca, 2019).

Another aspect of Phase 1's national-level analysis will apply a regional lens to the Top 200 metros and see how certain types of cities in certain parts of the country are faring regarding DID. Each tract with available data was assigned a DID index score. Then the average was calculated at the metro level. Some smaller metros were prone to higher averages, so the analysis was kept to just the Top 200 MSAs.

Figure 3 begins to answer some of these questions set out for this phase of the research. Unsurprisingly, cities and regions hit hardest by the subprime mortgage crisis or with a slower recovery are seeing higher rates of DID than comparable cities. Specifically, metros in the "Sun Belt" such as Florida, Texas, Louisiana, Georgia, and Alabama. Moreover, these results start to disrupt the list of cities we tend to associate with neighborhood displacement. For example, there are no metros that have "high" evidence of DID along the coast. As discussed in Essay 1, much of the neighborhood displacement research to date has focused almost exclusively on the coastal markets. Here most cities with high DID are in the central part of the US, specifically in the Rust Belt and parts of the central U.S. (like Oklahoma and Kansas). This is not surprising given what we know about the way these regions unevenly rebounded from the subprime mortgage crisis,

and vacancy is still very stagnant in these spaces (Harrison & Immergluck, 2021). They are mapped below.

Figure 3. Map of Average DID Score in Top 200 Metros



Furthermore, the regional differences in prevalence of DID and the specific noticeable concentration in the south and southeast could be speaking to political economy dynamics that this research is not set up to measure. As discussed, so much of disinvestment and displacement processes are directly associated with power, autonomy, and agency. This dissertation is seeking to name the intentional disinvestment decisions that have displacing impacts and provide community leaders with a resource for pushing for community-led displacement. The political realities of the south, do not support or promote the level of community organizing necessary to

fight structural disinvestment, that you saw particularly with the early community development movement in the 60s and 70s, that were the driving force of the Community Reinvestment Act (Westgate, 2011). There are less of these community organizing "muscles" in the south, though that is changing. The point being, DID is a byproduct of countless intentional decisions made by policy actors and there could be regional political differences at play that this project cannot adequately measure.

It is also interesting to see the rate of DID in smaller metros. Part of this is since homes in smaller cities are often less expensive than in larger ones, but it also speaks to a larger reality of uneven regional development propelled by this idea of "superstar" or "winner take all" cities and regions (Manduca, 2019; Florida et al., 2020).

When diving deeper into the map, there are three key things to discuss. The first and potentially most meaningful takeaway from the map of larger MSAs is the wide variety of evidence related to some markets often associated with growth and appreciation. Atlanta, for example, is showing some signs of DID, as are Philadelphia and Columbus. This supports the growing conceptualization of a housing sub-market framework, as opposed to the more normative regional housing market conceptualization (Teresa & Howell, 2020). It might be dangerous to consider an entire region as a "hot market" but instead recognize that even in growing regions, there are still areas showing other types of neighborhood change. It might seem counter-intuitive to acknowledge the duality of the fact that a cooler regional market contributes to neighborhood exits, but at the same time, warmer markets can still have pockets that are experiencing disinvestment even if the entire region is doing well. This is not a new duality. This exact phenomenon was at the heart of Marcuse's (1985) work in New York City.

The second key takeaway is the clear evidence or urging for more research into displacement in mid-sized cities. Table 14 below shows the ten metros (out of the top 200) with the highest DID Index averages. All but two of the below have metro populations of less than 500,000 people. There is virtually nothing the larger urban research field knows about displacement in places like Beaumont, Texas or Macon, Georgia, or Flint, Michigan. This was another problematization from Essay 1. The largest cities are taking up most of the oxygen on this topic. However, most Americans are clearly more likely to live in a city that has more in common with Macon or Beaumont than it does with Los Angeles or New York. Furthermore, the "superstar city" discussion has shown a light on how little growth and investment these second or third-tier cities have seen in recent decades, leading to concepts of "divergent" regional growth dichotomies (Manduca, 2019; Florida et al., 2020).

Table 14. Top Ten Metros with Strongest Evidence of DID

MSA Name	**DID Score**	**2015 Total Population**
Brownsville-Harlingen, TX	2.89879874	417,947
Flint, MI	2.892418258	415,874
Beaumont-Port Arthur, TX	2.778300586	405,695
McAllen-Edinburg-Mission, TX	2.638625049	819,217
Binghamton, NY	2.18783217	248,292
Ponce, PR	2.148536913	330,891
Youngstown-Warren-Boardman, OH-PA	2.124684297	556,243
Charleston, WV	2.005026608	223,922
Macon-Bibb County, GA	1.904912108	231,517
Huntington-Ashland, WV-KY-OH	1.876651161	363,700

Speaking of these larger U.S. metros, the third and final takeaway is the areas showing "Absolutely No" evidence of displacement by abandonment. For example, in southern California, areas like Los Angeles, San Jose, and San Diego are showing no evidence. Also in this category are cities like New York City, Washington D.C., and San Francisco. These are staples in the neighborhood displacement literature, and the drivers of displacement in these cities are no longer disinvestment-induced but, as shown in the first takeaway, that is not to say there is no DID occurring at all in these spaces.

Metros with High DID Index Scores (out of the Top 200)

The second phase of the DID spatial extent analyses will zoom into four cities with higher rates of DID evidence. Then map the distribution of DID evidence at the metro area scale to identify tracts with the highest rates of DID in those metros to see what spatial characteristics or clusters of DID neighborhoods can be discerned. For these maps, the same categories of DID scores will be used with breaks created from national DID score distributions using the previously discussed Jenks natural breaks methods. This will also allow us to see if there are any noticeable trends amongst cities with high rates of DID conditions to learn more about the types of areas experiencing DID. Since DID scores include metro home values, the differentiating factor within metros is hypervacancy, so maps of DID scores within metros (essentially vacancy maps) can be found in the map series in Appendix A.

Table 15. Top Ten Metros with Strongest Evidence of DID for Metros with 1M+ Population

MSA Name	**DID Score**	**2015 Total Population**
Detroit-Warren-Dearborn, MI	1.4195	4,296,416
Memphis, TN-MS-AR	1.2713	1,340,336
Buffalo-Cheektowaga, NY	1.2213	1,135,734
Cleveland-Elyria, OH	1.1885	2,064,483
Oklahoma City, OK	1.1113	1,318,408
Pittsburgh, PA	1.0424	2,358,926
San Juan-Bayamón-Caguas, PR	0.9586	2,263,582
Indianapolis-Carmel-Anderson, IN	0.9385	1,950,674
San Antonio-New Braunfels, TX	0.8795	2,286,702
Cincinnati, OH-KY-IN	0.8769	2,139,466

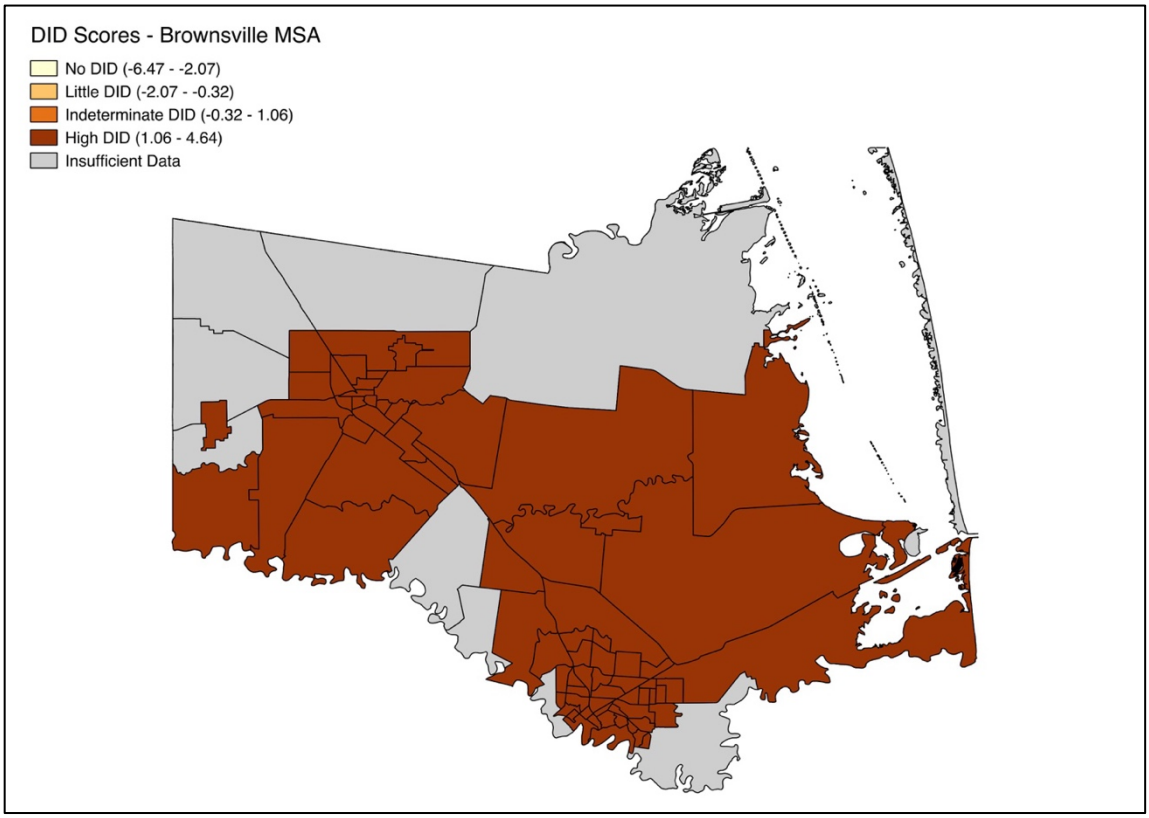
Before discussing both "Top ten" lists of DID it is necessary to note that these rankings are likely to contain significant error given the exploratory methodologies used herein. For example, the data used to construct both indexes includes census tracts with missing data for both the vacancy side, as well as for measuring home value at the metro level. As a result, the rankings are strictly for identifying patterns and trends to tee up future DID research. It is not fair to say any of these cities "lead the country" in DID. The existing measure contains far too much error to sincerely rank the cities on DID prevalence.

it is also notable that no metro on this list has a population of over a million. So, it makes sense to run a top 10 list with those larger metros specifically since rewarding low home values do tend to favor mid-sized cities. To be fair, favoring mid-sized cities in methodologies does not often happen in urban research. After isolating the larger cities, the trend of de-industrialization is unignorable. Most of these cities were former industrial cities, both in the north and Midwest as well as the south. Even San Juan, Puerto Rico, has a history of export-driven industrialization

that recent severe weather events and structural disinvestment have exacerbated (Rios, 1990). There has been much written about the connections between de-industrialization and disinvestment (Manduca, 2019; Hackworth, 2019). However, Table 16 also suggests that potentially there are some displacing realities of de-industrialization that research has yet to directly name or discuss.

When choosing the four metros to look more closely at, two of those metros will come from the top 10 in Table 15. Table 15 above shows the highest DID averages for metros with populations north of 1 million. Brownsville, Texas, and Flint, Michigan are the two metros out of the top 200. Detroit, Michigan, and Memphis, Tennessee are the two metros with the highest DID scores that have a population over 1M.

Figure 4. Map DID Evidence in Brownville, Texas Metro Area



Brownsville is located along the U.S. – Mexico border at the tip of the boot. It is bordered by the Gulf of Mexico and South Padre Island to the west and Mexico to the south. Situated right on the border, Brownsville is a city often associated with persistent poverty and structural disinvestment but is still a relative stranger to the national neighborhood displacement discussion. That may be changing soon as Elon Musk and SpaceX have decided to build the largest rocket ever created, a 400 feet tall re-usable craft that Musk is envisioning could be used to transport people and supplies to the Moon and Mars. The launch site, Starbase, is located roughly 7 miles east of Brownsville and has brought an influx of high-paid workers into the region (Lowry, June 29, 2022). This long-term investment is likely already having real market implications that could introduce other types of neighborhood change pressures to complement the DID the area was possibly experiencing during the housing market recovery.

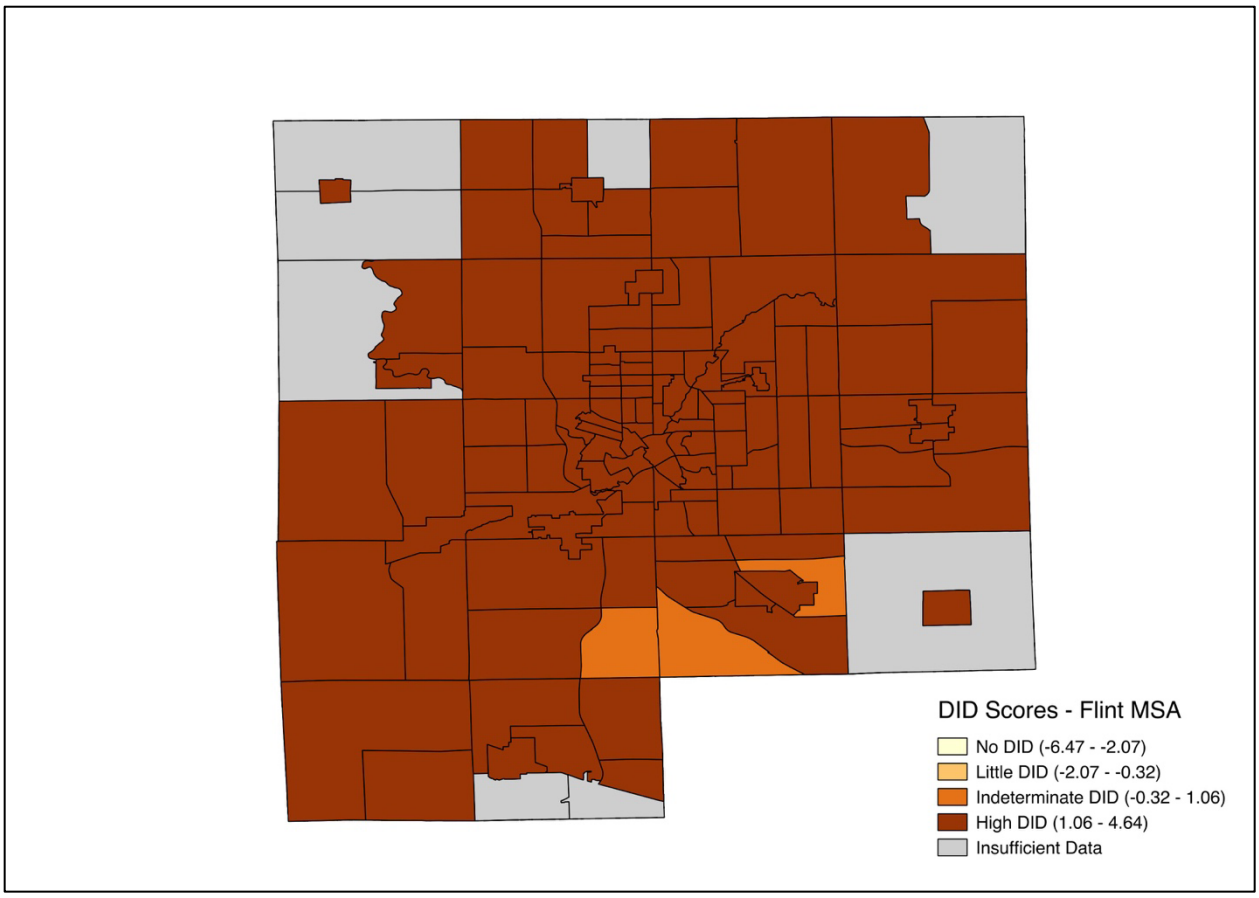
For this metro, the entire region is categorized as "High DID" given the area's depressed home values in 2015. When looking at Appendix A, you see the highest rates of DID are noticed in two categories of location. Somewhat unsurprisingly, there appear to be two or three tracts that are in or surround Brownville's densest core that have some of the highest rates of DID. This is to be expected even in mid-sized cities, but especially in larger metros. More surprisingly, there also seem to be higher rates of DID closest to the Gulf and to South Padre Island. There are two or three different tracts in the western part of the metro with high rates of DID that are adjacent to areas with some DID evidence. This could introduce an environmental reality to displacement, especially in areas likely to be impacted by sea level rise in the future. There has been little research that looks at this connection, but Brownsville could be another case study in addition to cities like Stockton, California, that are also experiencing this confluence of environmental and market displacement forces (Lievanos, 2020). Recognizing the existence of

DID in Brownsville and holding it alongside these environmental and economic development concerns could allow community development funders and actors (such as CDFIs) to begin targeting their investment toward a variety of neighborhood displacement processes (Quinonez & Smith, February 1, 2022).

Figure 4 below shows the metro with the second highest average DID index score in the country, Flint, Michigan. Flint is a majority Black city located about 80 miles northwest of Detroit. Flint is more discussed in national neighborhood change conversations but more so related to disinvestment and abandonment. As a result, Flint and its Genesee County Land Bank were one of the pioneers of land banking, a critiqued tactic that is often seen as being too market-oriented, where government "stewards" tax dead or otherwise abandoned property in hopes of making it feasible for reinvestment (Hackworth, 2014). Of course, repercussions from Flint's systematic disinvestment at the municipal level came to light during the water crisis, which was a situation not void of resident-driven pushback or activism (Nickels, 2019).

The Flint DID map reflects this spatially concentrated disinvestment, clearly centering around Flint's urban core and again dominating for most of the region except three tracts in the southern part, closer to Detroit's northwestern suburbs. Even when you look at Appendix A, it is easy to see how Flint's densest tracts near the center of the metro areas are also almost exclusively showing strong evidence of DID. This spatial trend is more centered on the urban core than in Brownsville's case, which showed evidence of environmental influence as well. Flint's DID trend almost produced zones of disinvestment emanating from the center and leading to areas with some DID, then to areas on the edges of the metro with low or very low DID.

Figure 5. Map DID Evidence in Flint, Michigan Metro Area



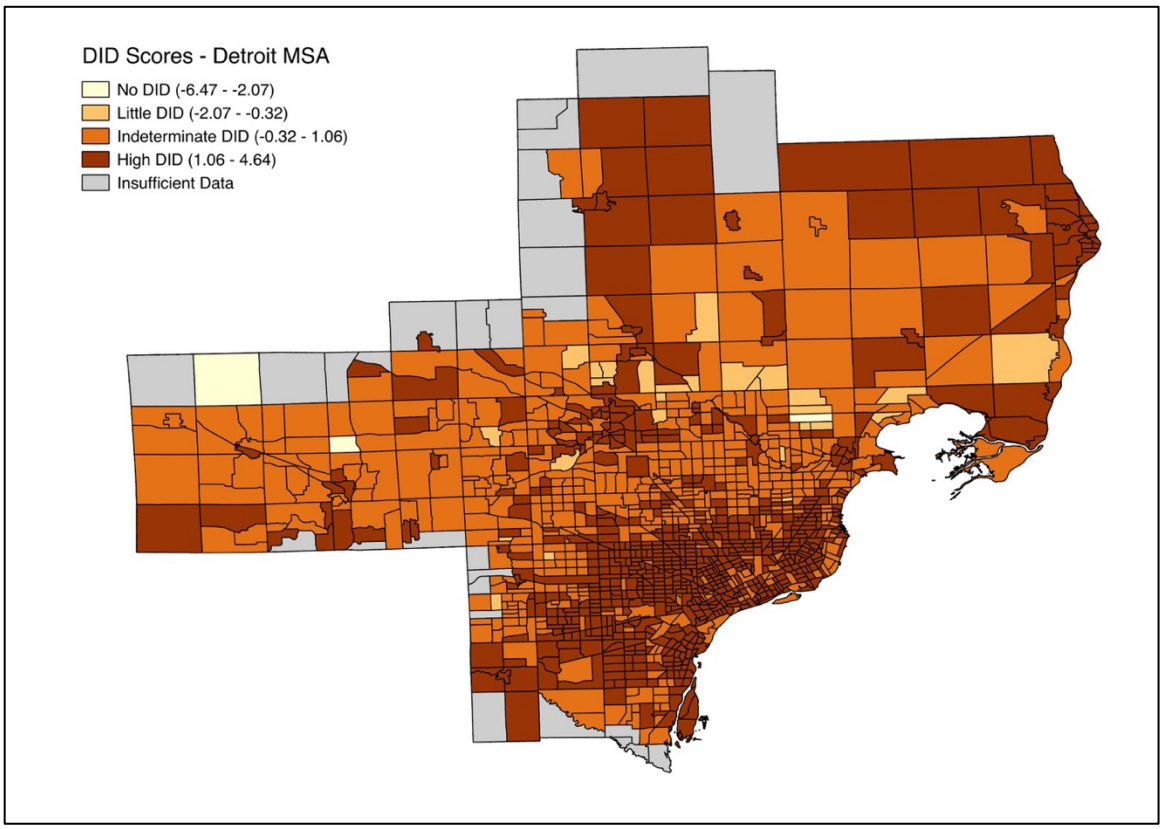
The final two metro maps focus on larger cities, Detroit and Memphis, neither of whom are strangers to discussions of displacement nor neighborhood change. Again, discussing these in order of highest average DID index score, Figure 6 shows DID in Detroit, Michigan. Detroit, the nation's largest Black city, in many ways, is a case study of a metro region that is experiencing both growth and decline forces simultaneously. The emphasis there is on the metro region distinction since many folks hear the most about *the city* of Detroit when they have for decades been a region with a declining urban core that is significantly Blacker. Compared to the affluent suburbs, which tend to have a higher proportion of white households and are where many of the

wealthiest auto executives have lived for most of the 20th century (Hackworth, 2019). It should come as no surprise then that recent research focused on "decline-induced-displacement," a synonymous term with what this paper is describing, has used Detroit as a case study for a divergent area experiencing various displacements (Seymour & Akers, 2022)

It is not surprising then to see a similar urban, suburban DID trend to the metro 80 miles away, Flint. The highest rates of DID in both Figure 6 and Appendix A are in the same areas that have experience centuries of racialized disinvestment from state and private actors. In the suburbs, affluence does not erase all evidence of DID. This could be partially because growth and decline are not mutually exclusive, and that is backed up by no DID tracts adjacency toward "some" and "low" DID tracts in the balance of the metros. There are also a couple of small amounts of high DID tracts outside of the urban core, but not many. These results reflect the realities of the Detroit region as a divided and divergent area (Mallach, 2018; Hackworth, 2019).

The other large city and the last of the four "zoom-ins" is Memphis. The second largest majority Black city in the country, behind Detroit, Memphis is not as familiar with neighborhood displacement discussions as Detroit, with two tangential exceptions. Some research has looked at ways Memphis is losing affordable rental housing through the "bottom of the market" (Immergluck et al., 2018). Also, the Urban Displacement Project did some applied research in a handful of cities a few years ago but looked primarily to apply a methodology that tracks gentrification pressures and did not measure any other type of displacement (Zuk & Chapple, 2015). A version of this web-based map can be found in Appendix B.

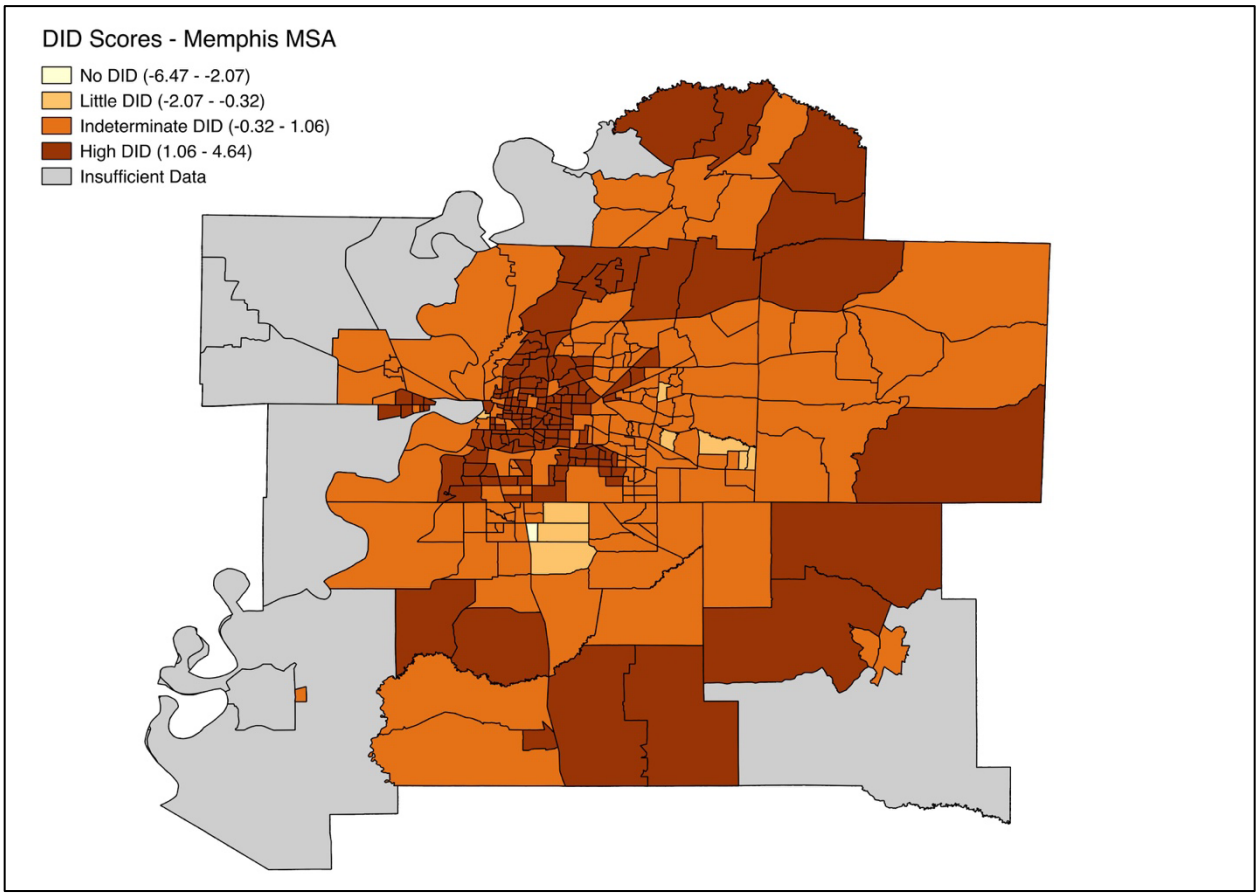
Figure 6. Map DID Evidence in Detroit, Michigan Metro Area



The Memphis map helps cement a clear trend between all four maps. First, there is the concertation of high DID tracts in the urban core. This spatial pattern mimics Memphis' choropleth of the "Pac-Man of Poverty" and the "Cone of Prosperity." The former is a byproduct of racial disinvestment in the neighborhoods surrounding Memphis' central business district, while the latter follows the eastern migration pattern of Memphis' affluent (mostly white) householders during the 1970s, 80s, and 90s. This same trend is at play here, with the majority of the high DID tracts following into this "Pac-Man of poverty." Somewhat surprisingly, using the national DID categories shows that much of this prosperous area also sees indeterminate amounts of DID. This finding lends credibility to the idea that DID can occur near market appreciation. The other trend that tracts with other maps is the presence of DID evidence in more

exurban parts of the metro. For Memphis, that means parts of Desoto County in Mississippi on the southern and southwest edge of the Metro, and parts of Crittenden County and West Memphis, in Arkansas along the western edge.

Figure 7. Map DID Evidence in Memphis, TN Metro Area



Key Takeaways & Limitations

The exploration conducted here has a considerable list of both contributions and limitations. This is not a bad thing, given the dearth of previous research on the relationship between disinvestment and displacement. These contributions and limitations should be seen as

the building blocks of a broader research agenda on the topic, with both things to build on and gaps to fill in future research.

Key Takeaways

Before digging into the main contributions this paper provides, it is worth discussing a significant caveat to all of these findings. Again, this essay is building on Essay 2 and the findings from that exploratory analysis. There is only so much quantitative analytics using secondary data that can account for. There is certainly a myriad of local processes that policy actors at all levels are responding to, and this analysis is able to account for a very small subset of those processes. Moreover, some of these processes measured are proxies for policy decisions (i.e., school closures) and should be treated as such. With that being said, shall we discuss the key takeaways?

There are four key contributions worth discussing. First, there is now more recent evidence supporting Marcuse's (1985) claim that displacement driven by abandonment can occur in the same city or near areas experiencing displacement by exclusion or gentrification pressures. This shows up in two ways in this essay. The first way, at the metro level, there were metros that are typically associated with having some of the hottest markets in America during the market recovery period. Cities like Atlanta, Houston, Las Vegas, and Chicago all saw at least some evidence of DID, with Houston having strong evidence. The second way is when drilling down to the neighborhood level in cities like Memphis, it was easy to see how the parts of the city traditionally known for whiter and/or affluent areas were also near or in some of the strongest clusters of DID. The urban research field is still coming to terms with the impacts of uneven

development and racial capitalism, so it should not be a stretch to think the pushes and pulls of gentrification and abandonment can be occurring side-by-side in places like Memphis or Detroit.

The second key takeaway can also double as a call for future research. Something related to displacement is clearly going on in mid-sized and smaller cities. Metros with less than 500,000 people dominated the Top 10 list in Table 14. Furthermore, 20 of the top 25 MSA DID index averages are in metros with less than 800,000 people. Urban research is scarce in mid-sized and smaller cities, which is a real problem given the fact that most Americans live in places more like Flint and Brownsville. More than just urban research, specifically neighborhood change research, should center on mid-sized cities more and understand the extent to which different types of displacement are at play in these communities.

The third key takeaway also serves as identifying a gap in the literature where more research could be necessary. The urban fringe or the edge of metro areas across all four maps showed some evidence for DID. These exurban neighborhoods are on the "front lines" of urban expansion, yet there is very little we know about these places. This is also the case for neighborhood change, especially in sprawling metros like Memphis or Atlanta. Moreover, understanding the ways disinvestment manifests could influence our understanding of DID as well.

The fourth and final key takeaway is arguably the most important. All four metros with the highest DID are also metro regions that center around four cities that are *all* majority-minority. Detroit and Memphis are the two largest Black cities in the U.S., and Flint is also majority Black (54.1%) at the time of this research, according to the census. Brownsville, being on the Mexico border, is 94% Hispanic during this time. So, there is an unignorable racial and ethnic reality to DID that is very deserving of more discussion. This is not surprising based on

what we know about urban residential segregation and neighborhood change *within cities* (Jargowsky, 2013) and based on what we know about the ways racial capitalism manifests in urban development (Gilmore, 2008; Dantzler, 2021)

Limitations

The limitations here are significant, but again, given the exploratory context the study is operating in, most of these research limits are a function of knowledge gaps regarding this topic. Three key limitations should be noted here. This list is not exhaustive. First, and most importantly, since the extent of DID is measured by the results from Essay 2, many if not all those limitations also apply to this essay. The concerns with the timing of the study, imperfect or missing data, and the binary resident exit are all coming into play in this study. Second, the factor index created here could be seen as oversimplifying the DID process. This conceptualization of DID is complex, and neither gentrification, disinvestment, nor stagnation of neighborhoods occurs in a vacuum. Many of these things could be taking place in the same neighborhood even, depending on how you operationalize that term, especially given these results. Thirdly, the DID measure is missing a metric that accounts for the "second D" displacement. While these are measures that were shown in Essay 2 to heavily impact displacement and this measure was validated using common index validity methods. It is limiting not to have a specific metric of displacement included in this index. The main reason a displacement measure is hard to add to DID is due to limited micro-mobility information at the national level. The census asks for how long a family has lived in a specific residence, but there is no national database that can speak to and from which neighborhood (or census tract) a family has moved. Fourth and finally, there are some measurement errors in the census median home

value measure and the USPS long-term vacancy measure, which are the two key measures in the DID index. It is difficult to know how but based on what we know regarding these two measures, it is likely that there are some limitations, and the results should be taken in the context of these imperfect measures.

Despite this paper's imperfections, the results clearly show a link between disinvestment, decline, and neighborhood displacement. This dissertation was always intended to be an exploration of this topic, and the exploration has found something worth digging into more. In the conclusion, I will recap the key findings from all three core essays and set out a research trajectory for the future of DID research.

CONCLUSION

For decades now, the larger urban dialogue around neighborhood change has been singularly focused on gentrification and the impacts of urban reinvestment. All the while, the vast majority of historically disinvested urban communities were continuing to see the same pattern of uneven decline and disinvestment that had characterized the last half-century in many American cities (Harrison & Immergluck, 2021). Now yet again, since the pandemic, the attention towards investment, appreciation, and gentrification "pressures" has only increased even though this most recent housing value spike is still leaving out many Black and Brown communities (Gregory, November 18, 2021).

With many of these neighborhoods still wrestling with impacts of decline and underinvestment, market spikes at the national level are not the answer. Plus, more "bottom-up" and "community-driven" development is proven to be more sustainable and long-lasting than "top-down" market-driven investment approaches (Wright, 2018). Unfortunately, these community development discussions are clouded by the gentrification discourses and the realities of the urban political economy, making it hard for community developers and organizers to carve out a space to discuss resident-led development strategies (Axel-Lute, 2019).

Enter stage right this dissertation topic, which hopes to become a resource for the organizer and community developer in carving out space for these community-led development discussions and planning efforts. This dissertation first problematized the existing displacement research by highlighting the specific ways displacement discussions are overlooking or ignoring other types of neighborhood change, especially disinvestment. Then, specific elements of disinvestment such as hypervacancy and low regional home values were shown to be associated with a household's decision to leave a neighborhood. Finally, a firmer conceptualization of the

term or concept used to describe the process of decline or disinvestment leading to displacement ("disinvestment-induced-displacement" or DID) is put forth alongside an exploratory spatial analysis looking at the extent of DID evidence in medium to large metro regions.

Key Findings from Essay 1

Essay 1 centered on a systemic review of existing displacement research that showcased the lack of nuance regarding types of neighborhood change, with a clear over-emphasis on gentrification and larger cities. Other market contexts and smaller, more mid-size cities and metros receive little to no attention, even in non-academic settings. This suggests that current research on neighborhood change is only reifying the previously mentioned "gentrify or die" paradigm, where the notion of gentrification and neighborhood-life cycle theory produce two polarizing destinies for an urban neighborhood. Either these neighborhoods will gentrify, or they will "die" in a manner that makes it easier to gentrify when the time comes. It is clearly not enough to categorize disinvestment as a "not-gentrifying" or "other" category when neighborhood displacement typologies are produced in these studies, and questions of abandonment and disinvestment should be centered alongside other neighborhood change types (e.g., residential segregation, concentrated poverty, etc.).

Another implication of Essay 1 is the impact of restricted access to granular mobility data. This is a finding other methodological meta-analyses on neighborhood displacement echo (Hwang & Lin, 2016). It is certainly problematic for neighborhood advocates and practitioners who are left to deal with the "gentrify of die" realities this lack of data re-produces. Not to mention the challenges it produces for researchers who want to examine the extent to which disinvestment and abandonment lead to displacement or other types of neighborhood change

processes. Overall, it hamstrings how much we can learn about displacement broadly, and it is clear the impacts of these data challenges on the research.

Where most displacement research focuses are also a key takeaway from this piece. Though the non-academic body of research disrupted this reality to a certain extent, it was clear that in just about every instance where a single-city study was conducted, it occurred in a growing, larger city. Unsurprisingly, Chicago and New York were the most studied. Most Americans do not live in Chicago and New York or even cities in that same category, such as San Francisco or Washington D.C. If the majority of neighborhood change research is occurring in these settings, it limits what we know about the rest of U.S. cities and as Essay 3 shows it leads to overlooking a larger trend of "superstar cities" or divergent regional economies which could also have real neighborhood displacement implications (Manduca, 2019; Florida et al., 2020).

Key Findings from Essay 2

Essay 2, at its best, constitutes an opening of the DID "door" by exploring a variety of ways disinvestment processes are potentially associated with neighborhood displacement, measured here by a household deciding to leave a neighborhood (census tract). This entire dissertation is explicitly concerned with lower-income households (<100% National AMI) and the ability of cities to respond to the needs of all residents. The sample size in the analysis centered on a subset of PSID households that made less than the area's household median.

The most robust and telling finding here is the role of the hypervacancy threshold. The fact that once a neighborhood sees more than 20% vacancy, the likelihood of a household exit increases by over 50% is very telling. It also could support Marcuse's (1985) "last resident"

resident displacement, but of course, that depends on when you define a household as one of or the last resident on a block or in a community. Marcuse's operationalization of that term in 1980s NYC is different than how you might consider applying that term to 2022 American cities. Regardless of operationalization, severe vacancy, which research has shown is stagnant in some of the U.S.'s most populous regions (i.e., Sun Belt and Rust Belt), is leading to displacement. After all, what clearer sign could a family have that their place is no longer a place you want to be than seeing at least one out of every five buildings in their neighborhood sit vacant for long periods of time?

In addition to hypervacancy, metropolitan-level home values clearly play a role in all of this as well. Declining home values observed at the metro level are connected to a variety of other regional economic and political forces, as described in the disinvestment literature (Mallach, 2018a; Hackworth, 2019). Regional economic divergence and its impact on neighborhood-level changes is not receiving the attention it deserves, and this research is further proof that it warrants a much closer look.

Key Findings from Essay 3

The final essay in this dissertation sought to set the stage for the next wave of DID research. To do this, it had three distinct functions. One was to further conceptualize and define DID. For this dissertation, DID is defined as *a spatially concentrated neighborhood change process that makes residing in that area unreasonable or hazardous in ways that are beyond the household's control*. Next, the third essay wanted to create a replicable way to measure DID, and that occurred in the form of the DID Index, a variation of the Townsend Deprivation Index using

concentrated vacancy and regional home values. Thirdly, the DID index makes it possible to map the extent of DID and see which cities have the highest concentration of DID.

By achieving these three functions, it produced a few key understandings worth noting. To begin, there is now more recent evidence supporting Marcuse's (1985) claim that displacement driven by abandonment can occur in the same city or near areas experiencing displacement by exclusion or gentrification pressures. This is evident in both the extent to which DID was present in cities associated with growth and gentrification pressures (i.e., Atlanta, Chicago, Philadelphia, etc.) and the ways that DID scores clustered around areas traditionally affluent such as Detroit and Memphis suburbs.

Another interesting finding here can also double as a call for future research. Something related to displacement is clearly going on in mid-sized and smaller cities. Metros with less than 500,000 people dominated the Top 10 list in Table 14. Furthermore, 20 of the top 25 MSA DID index averages are in metros with less than 800,000 people. Urban research is scarce in mid-sized and smaller cities, which is a real problem given the fact that most Americans live in places more like Flint and Brownsville.

Finally, all four metros with the highest DID are also metro regions that center around four cities that are *all* majority-minority. Detroit and Memphis are the two largest Black cities in the U.S., and Flint is also majority Black (54.1%) at the time of this research, according to the census. Brownsville, being on the Mexico border, is 94% Hispanic during this time. So, there is an unignorable racial and ethnic reality to DID that is very deserving of more discussion. This is not surprising based on what we know about urban residential segregation and neighborhood change *within cities* (Jargowsky, 2013) and based on what we know about ways racial capitalism manifests in urban development (Dantzler, 2021)

Applying the DID Index to Local Neighborhood Change Discussions

Throughout the dissertation, I nodded to the normative way neighborhood change concerns tend to manifest in my time as a community organizer. Someone proposes a neighborhood-level intervention (community garden, art instillation, etc.), and well-deserved displacement concerns are raised by legacy residents. If nothing else, I think this index can impact and disrupt these norms in two ways.

First, this dissertation has shown a very clear link between decline and displacement both in the multi-variate analysis in Essay 2 and in the subsequent creation of a DID measure in Essay 3. Especially when looking at the post-industrial nature of DID, it is clear to see how structurally racist forces have made intentional decisions to withhold resources and discourage investment in Brown and Black neighborhoods. I hope this research can be referenced by organizers and neighborhood leaders when pushing private and public actors to invest in their communities *the right way*. Those final three words are incredibly important. In a structurally disinvested context, private and public actors have this "you should be lucky you are getting anything" mentality that treats *all investments* as the *right investment*. However, the distinction rests on self-determinism and whether residents agree with the way outside actors are proposing to intervene. So hopefully, the next time an organizer is advocating against unwanted investment. This research can be used to advocate for a resident-led development discussion.

Secondly, the DID index and this dissertation could be used to better situate the role of race in neighborhood change and decline processes. While urban studies research has addressed some of the ways race is a structuring force in neighborhood change, there is less of that in the disinvestment and decline literature (Rucks-Ahidina, 2021). The fact that many of the cities with the highest rates of DID are also majority Black or Brown cities is not unintentional. It becomes

harder to argue it is unintentional when you consider the intentional decisions (made actively or passively) proxied for in Essay 2 and their discussed impacts (i.e., hypervacancy). Therefore, this dissertation can and should be used to argue for race as more of a main effect than a side effect. The DID research trajectory that follows takes this into account. It should be a primary objective to continue showcasing the structurally racist forces at play in the D-words (disinvest, decline, etc.) and in the R-words (reinvest, redevelop, revitalize).

DID Research Trajectory

While working on this dissertation, it became clear that I am not the only person in the urban research field seeing these problematic oversights around neighborhood change and displacement. Recent research around "decline-induced-displacement" and research that seeks to know why households leave historically Black middle-class neighborhoods are helping to construct a firmer research agenda around this topic (Seymour & Akers, 2022; Mallach & Harrison, 2021; Snidal et al., 2022). Marcuse (1985) sought to draw attention to this same issue as he noticed the ways New York City was changing in the 1980s, but for decades there has not been a concerted effort to explore this topic until now.

As this research agenda grows and evolves, I submit four guiding questions worth further exploration to continue carving out spaces for community-driven development.

1. Are neighborhood indicators (e.g., vacancy, home values, etc.) or other quantitative datasets the best way to measure how residents are responding and internalizing neighborhood change (Jones & Dantzler, 2021)?
2. So much displacement research has centered on larger cities. Are the "gentrification pressures" noted in places like NYC, LA, DC, applicable to places like Macon,

Youngstown, or Flint? Moreover, even when investment comes, does it have the same impacts as noted in larger cities?

3. How are regional economic processes (i.e., job growth/loss, home sales, migration patterns) impacting neighborhood change and displacement?
4. How do residents in historically disinvested neighborhoods react to more incremental forms of investment? Does the size or manner of the proposed investment mitigate fears of displacement?

If this dissertation constituted the "opening of the DID door," then these four questions can be the "long squeak" of the door as we dive deeper into neighborhood change discourse to better frame local discussions around these topics. There are likely 400 more questions where these came from. But if our goal is to better equip residents and community organizers with the resources needed to fight for their communities, then these four questions are as good of a starting point as any. If we believe communities and neighborhoods are fundamental to the urban experience, then we should also believe that a resident's ability to impact these spaces is just as fundamental. This dissertation names that and serves as the first step toward a career devoted to this and related topics.

APPENDICES

Appendix A: Phase 3 & Phase 4 Logistic Regression (Robustness Check)

Estimation of Family Exiting Neighborhood, 2015 – 2017 for PSID Households <100% Area median income – Phase 3 (Logit)

	Model 1			*Model 2*		
	OR	*p-val*	*SE**	*Coeff*	*p-val*	*SE**
High Vacancy 2011 - 2014 (4% - 9.99%)	0.896	0.519	0.152	0.9114	0.600	0.1612
Very High Vacancy 2011 - 2014 (10% - 19.99%)	**0.468**	**0.049**	**0.180**	0.5114	0.110	0.2145
Hypervacancy 2011 - 2014 (20%+)	***3.050***	***0.005***	***5.038***	***5.6580***	***0.003***	***9.3641***
Percent Change in Home Value 2011 - 2014	0.999	0.542	0.002	0.9977	0.314	0.0023
Some Residential Investment 2014 ($500K - $999K)	*2.410*	*0.067*	*1.159*	**2.6444**	**0.049**	**1.3062**
Little to No Residential Investment 2014 ($0-$499K)	0.751	0.693	0.544	0.9829	0.983	0.8193
Total School Closures in Tract from 2011 to 2014	*0.751*	*0.091*	*0.127*	0.7657	0.164	0.1467
Family Size	*1.078*	*0.096*	*0.049*	1.0411	0.419	0.0519
Family in a Duplex	0.975	0.929	0.274	0.8435	0.559	0.2457
Family in an Apartment	***1.539***	***0.009***	***0.252***	***1.6377***	***0.004***	***0.2822***
Total Family Rent ($100s)	**0.999**	**0.028**	**0.005**	*0.9913*	*0.080*	*0.0049*
Family Does Not Own Home	***5.012***	***0.000***	***0.948***	***3.0421***	***0.000***	***0.6268***
Total Family Income ($1000s)	1.004	0.307	0.004	1.0030	0.487	0.0044
Family Head - Black	0.898	0.543	0.159	0.8434	0.343	0.1515
Family Head - Asian	0.387	0.500	0.544	0.5293	0.729	0.6986
Family Head - Hispanic	**0.440**	**0.043**	**0.178**	0.5196	0.129	0.2241
Recent Job-Related Exit	1.754	0.100	0.599	1.5747	0.235	0.6022

Proportion of Neighborhood Black	1.002	0.504	0.004	1.0001	0.970	0.0039
Proportion of Neighborhood Asian	1.010	0.506	0.016	1.0146	0.393	0.0173
Proportion of Neighborhood Hispanic	1.005	0.347	0.005	1.0048	0.346	0.0051
Proportion of Neighborhood Commuting 30+min	*0.990*	*0.064*	*0.005*	*0.9890*	*0.053*	*0.0057*
Proportion of Neighborhood that Rents (2014)	1.009	0.145	0.006	1.0059	0.344	0.0062
Neighborhood Median Household Income ($1000s)	1.004	0.534	0.006	0.9994	0.923	0.0063
Proportion of Neighborhood with Professional/Tech Jobs	1.004	0.638	0.008	1.0068	0.413	0.0083
Neighborhood Population Density Per Square Mile	40300.000	0.687	175000.000	31000.000	0.598	152000.000
Median Age of Building in Neighborhood	0.999	0.859	0.001	1.0001	0.925	0.0007
MSA Population Change (2011 – 2014)	1.004	0.458	0.005	1.0054	0.305	0.0042
MSA Median Home Value ($1000s)	***0.997***	***0.008***	***0.001***	*0.9977*	*0.081*	*0.0013*
MSA Median Household Income ($1000s)	1.017	0.125	0.013	1.0118	0.322	0.0122
Family is Definitely or Probably Moving Soon				***2.2431***	***0.000***	***0.4847***
Family is Uncertain of Mobility Intentions				*1.5060*	*0.087*	*0.3598*
N = 1,399						
Pseudo R-square	0.1332			0.1957		

Notes: *Clustered (at census tract), robust standard errors; Bold and italicized = significant < 0.01; bold = significant < 0.05; italicized = significant < 0.10; “Disinvestment” Variables Bolded, included metro variables associated with household exits

Estimation of Family Exiting Neighborhood, 2015 – 2017 for PSID Households <100% AMI – Phase 4 (Logit)

	Model 1			*Model 2*		
	OR	*p-val*	*SE**	*Coeff*	*p-val*	*SE**
High Vacancy 2011 - 2014 (4% - 9.99%)	0.9456	0.763	0.1756	0.9691	0.872	0.1887
Very High Vacancy 2011 - 2014 (10% - 19.99%)	*0.4749*	*0.077*	*0.2001*	0.5225	0.131	0.2245
Hypervacancy 2011 - 2014 (20%+)	**3.3416**	**0.011**	**5.663**	**6.0275**	**0.029**	**10.0740**
Percent Change in Home Value 2011 - 2014	0.9950	0.134	0.0033	*0.9943*	*0.090*	*0.0033*
Some Residential Investment 2014 ($500K - $999K)	**2.8452**	**0.039**	**1.4377**	**3.1060**	**0.024**	**1.5623**
Little to No Residential Investment 2014 ($0-$499K)	0.5474	0.341	0.3461	0.7214	0.654	0.5253
Total School Closures in Tract from 2011 to 2014	0.8674	0.414	0.1512	0.8748	0.476	0.1642
Family Size	1.0723	0.148	0.0518	1.0176	0.737	0.0530
Family in a Duplex	0.9279	0.812	0.2923	0.7984	0.493	0.2621
Family in an Apartment	**1.4766**	**0.026**	**0.2590**	**1.5945**	**0.012**	**0.2976**
Total Family Rent	**0.9989**	**0.041**	**0.0006**	0.9919	0.174	0.0006
Family Does Not Own Home	***8.1249***	***0.000***	***1.6912***	***4.7440***	***0.000***	***1.0818***
Total Family Income	1.0051	0.166	0.0037	1.0040	0.301	0.0039
Family Head - Black	0.8867	0.590	0.1779	0.7930	0.270	0.1668
Family Head - Asian	0.3331	0.356	0.3966	0.5642	0.627	0.6645
Family Head - Hispanic	0.5627	0.172	0.2368	0.6739	0.372	0.2982
Recent Job-Related Exit	1.2984	0.518	0.5243	0.9181	0.835	0.3772
Proportion of Neighborhood Black	1.0032	0.459	0.0043	0.9982	0.714	0.0049

Proportion of Neighborhood Asian	1.0188	0.245	0.0163	1.0211	0.192	0.0163
Proportion of Neighborhood Hispanic	1.0104	0.158	0.0074	1.0102	0.185	0.0077
Proportion of Neighborhood Commuting 30+min	**0.9843**	**0.037**	**0.0075**	0.9870	0.100	0.0078
Proportion of Neighborhood that Rents (2014)	0.9992	0.897	0.0063	0.9952	0.451	0.0064
Neighborhood Median Household Income	1.0013	0.855	0.0069	0.9927	0.312	0.0072
Proportion of Neighborhood with Professional/Tech Jobs	0.9996	0.965	0.0088	1.0046	0.621	0.0094
Neighborhood Population Density Per Square Mile	91300000.000	0.260	42900000.000	42400000.000	0.296	21100000.000
Median Age of Building in Neighborhood	0.9998	0.727	0.0005	1.0001	0.862	0.0005
Family is Definitely or Probably Moving Soon				***4.2638***	***0.000***	***0.8540***
Family is Uncertain of Mobility Intentions				1.5285	0.110	0.4055
N = 1,399						
Pseudo R-square	0.225			0.255		

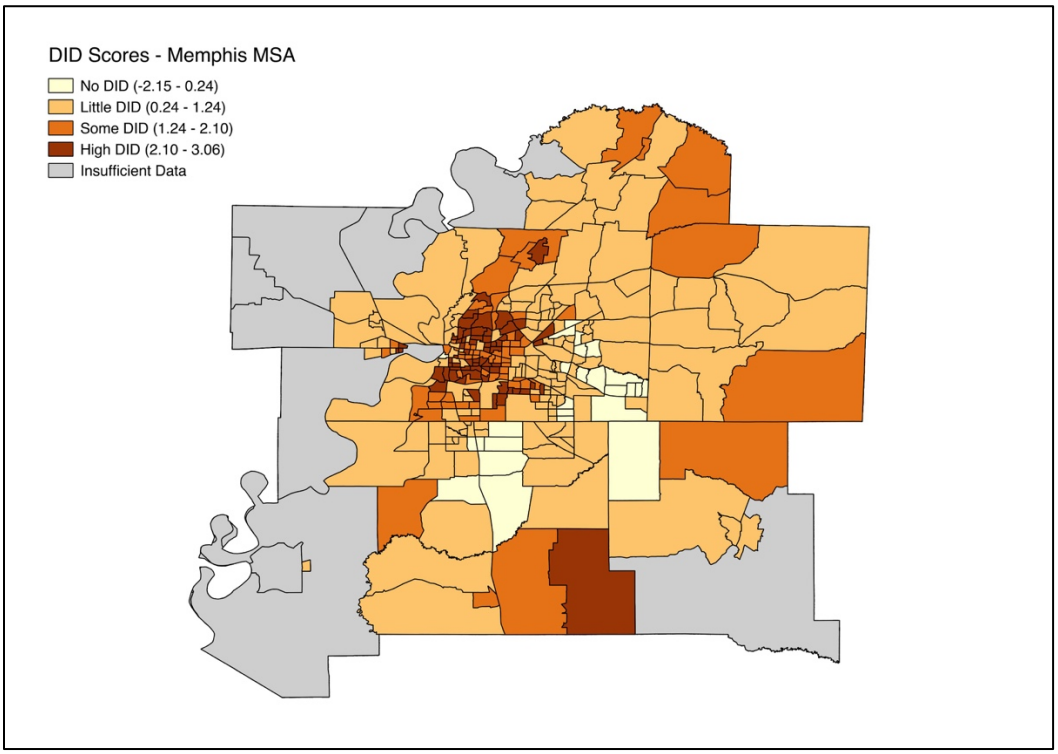
*Clustered (at census tract), robust standard errors

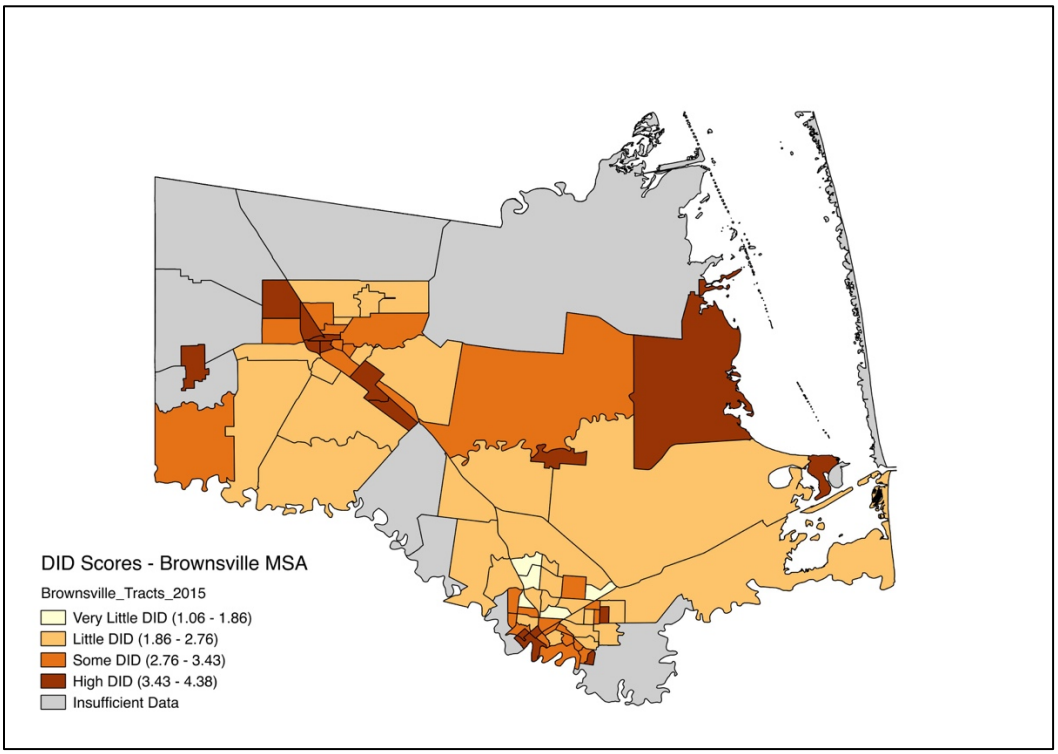
Includes 201 MSA Fixed Effects dummy variables, not reported

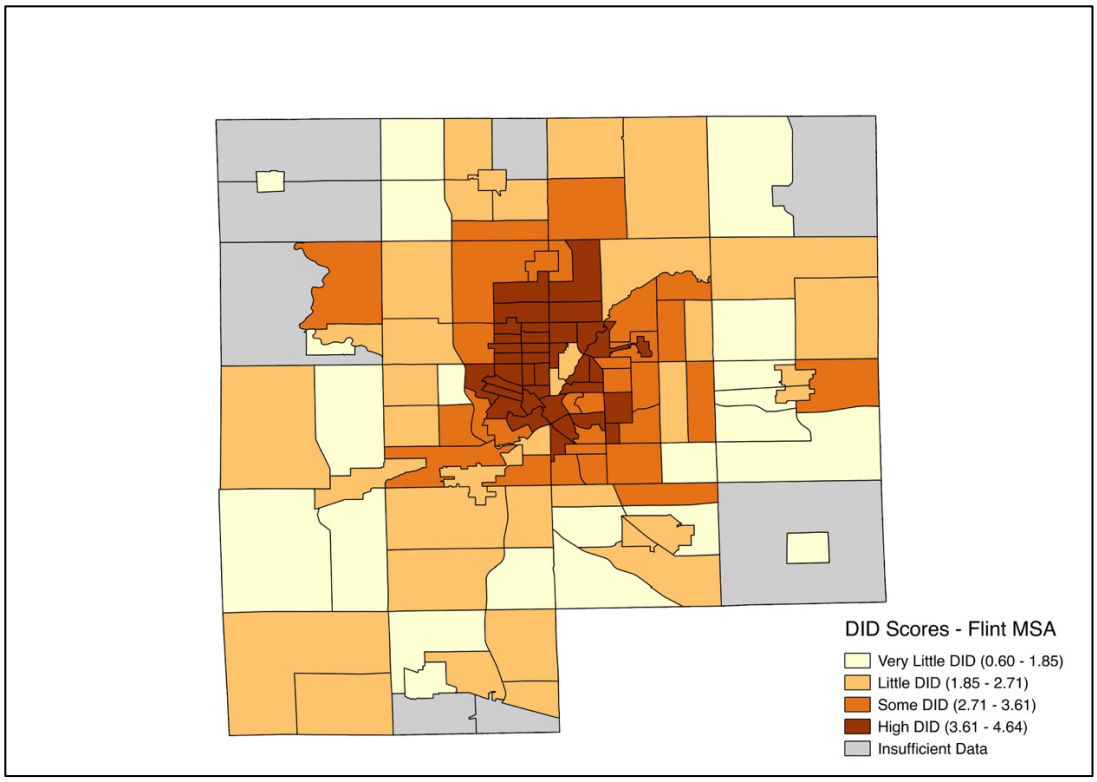
Bold and italicized = significant < 0.01; bold = significant < 0.05; italicized = significant < 0.10

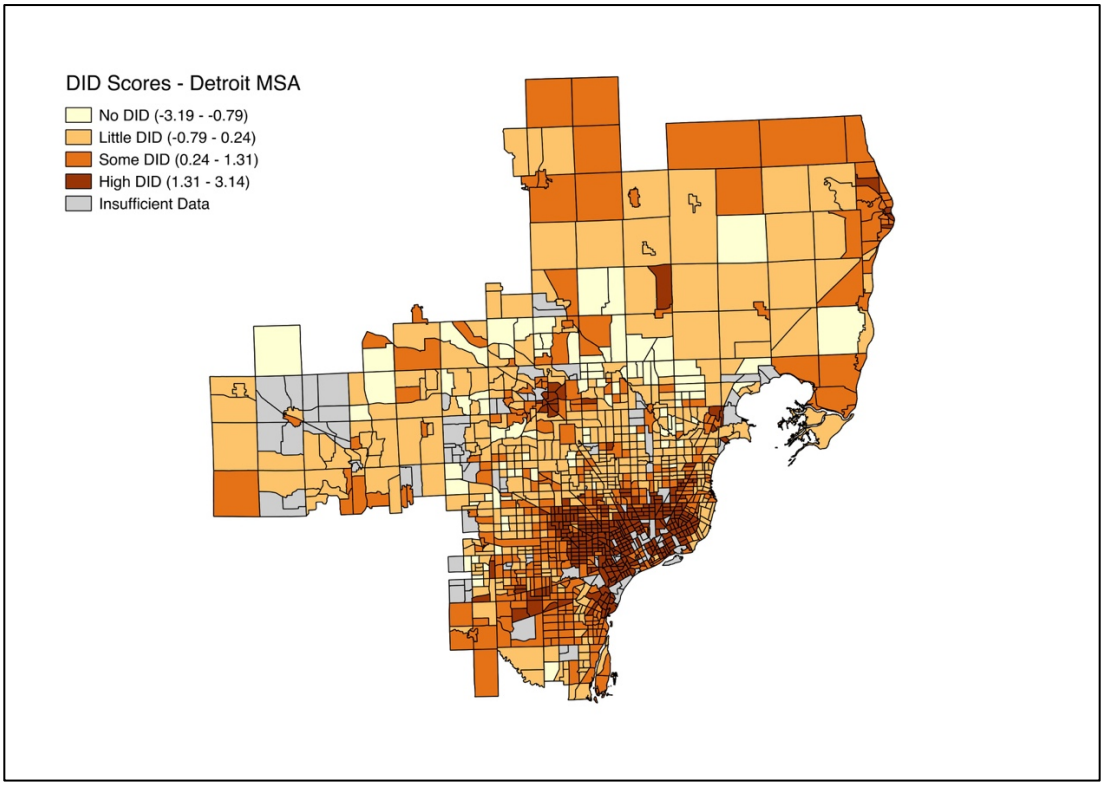
“Disinvestment” Variables Bolded, included metro variables associated with household exits

Appendix B: DID Score Maps Using Within-Metro Category Breaks

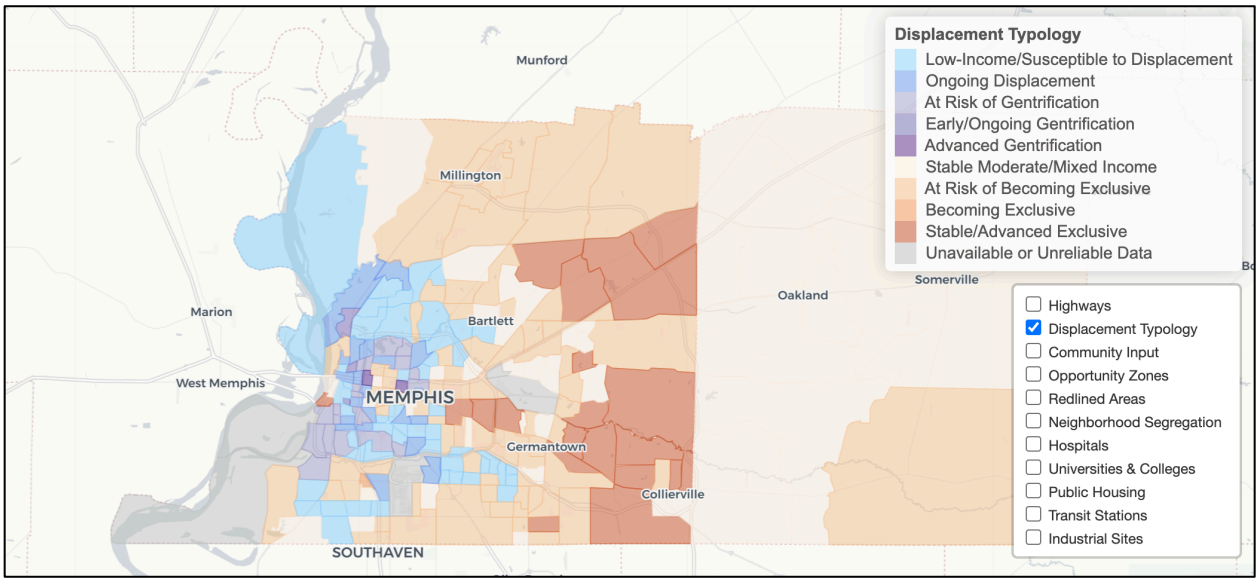





DID Scores - Flint MSA
Very Little DID (0.60 - 1.85)
Little DID (1.85 - 2.71)
Some DID (2.71 - 3.61)
High DID (3.61 - 4.64)
Insufficient Data


DID Scores - Detroit MSA
No DID (-3.19 - -0.79)
Little DID (-0.79 - 0.24)
Some DID (0.24 - 1.31)
High DID (1.31 - 3.14)
Insufficient Data

Appendix C: Urban Displacement Project Map of Memphis, TN



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