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The Battle of the Belts: Comparing Housing Vacancy in Larger Metros in the Sun Belt and the Rust Belt Since the Mortgage Crisis, 2012 to 2019

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Comparing Housing Vacancy in Larger Metros in the Sun Belt and the Rust Belt Since the Mortgage Crisis, 2012 to 2019

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Abstract

As a result of the 2007-2011 mortgage crisis, cities across the US experienced an unprecedented increase in housing vacancy. Since 2012, the broad national housing market has generally experienced a recovery, but it has been a highly uneven recovery. This paper focuses on changes in neighborhood-level, long-term vacancy rates from 2012 to 2019 in two critical regions of the US, the Sunbelt and the Rustbelt. We examine medium-sized and large metro areas in both regions. We focus particularly on the extent to which very high rates of neighborhood-level housing vacancy persisted during the recovery.

Perhaps unsurprisingly, long-term, very high levels of neighborhood housing vacancy appear to have persisted more in Rustbelt than in Sunbelt metros from 2012 to 2019. Sunbelt metros tended to see more population and housing price growth and greater declines in vacancy, especially in the number of very high and extreme vacancy neighborhoods. However, neighborhoods with high vacancy rates are not solely a feature of the Rustbelt. There are a substantial number of weak-growth metros in the Sunbelt, especially outside of California and Florida, in which very high levels of vacancy have remained a problem even in the face of a broader national recovery. In the Sunbelt and, in particular, the Rustbelt, neighborhoods with very high and, especially, extreme vacancy rates tend to have large Black populations and high poverty rates. Thus, the problem of hypervacancy appears strongly associated with the problem of racial and economic segregation.

Given the new uncertainties in the housing market created by COVID-19, it is important to recognize that economic shock and the challenges families are facing in paying rent and mortgages, may spur a new round of vacancy challenges. It is also critical to recognize that very high levels of vacancy tend to be concentrated in higher-poverty communities of color, especially in Black neighborhoods, and thus those seeking to address housing justice, community development, and the racial wealth gap need to pay attention to the problem of hypervacancy. Understanding the trends in, and characteristics of, housing vacancy will aid policymakers and practitioners in their efforts to address this important issue.

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INTRODUCTION

For as long as America has had houses it has had empty houses. Seasonal vacancies, vacancies created by new builds or for-sale homes, or rental vacancies: whatever the cause, the reason, or the duration, empty houses are inevitable. A certain quantity of vacant houses is even a characteristic of a healthy housing market to stimulate further market activity. Beginning in the second half of the 20th century, specifically from 1980 onward, America's numbers of empty houses slowly crept from healthy market levels to more dangerous levels in certain cities, especially in America's older post-industrial urban areas. Beginning in the late 1990s and early 2000s, urban experts began taking notice of how many vacant houses there were, where they were located, and what to do in neighborhoods with a high concentration of empty, abandoned homes (Mallach, 2018; Accordino & Johnson, 2000). Following the sub-prime mortgage crisis beginning in 2007, which resulted in unprecedented increases in foreclosed, vacant, and abandoned homes, the empty house conversation became central to the American housing policy conversation (Immergluck, 2010). Over ten years later, this paper applies a regional lens to look at changes in vacancy during the broader housing recovery since 2012.

In this paper, we examine neighborhood-level vacancy trends in Rust Belt and Sun Belt metropolitan areas from 2012 to 2019.[2] We pose the following research questions. How persistent was long-term vacancy during the national recovery in the large metropolitan areas of the Rust Belt and the Sun Belt? Did one region exhibit more resilience in seeing larger declines

[2] The Rust Belt is defined here as it is by Hackworth (2019), who includes the states bordering the Great Lakes including Indiana, Illinois, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin, as well as two large metropolitan areas that spill over into these states: St. Louis and Louisville. The Sun Belt is defined as it has been by Strom (2017), which includes the states south of the 37th parallel: North Carolina, Georgia, Alabama, Mississippi, Tennessee, Louisiana, Arkansas, Oklahoma, Texas, New Mexico, Arizona, Florida, Nevada, and Southern California.

in the number of neighborhoods with very high levels of vacancy? To what extent was this explained by different housing cost levels and growth trajectories among the metros in these two regions? Did metros with similar cost levels and growth trajectories in the two regions experience similar levels of persistent long-term vacancy? What are the racial and poverty characteristics of neighborhoods with long-term vacancy and do these characteristics differ between the Rust Belt and the Sun Belt?

Before a discussion of the literature, a few key terms should be defined, including the term “vacant home.” In the practical and academic discourse around vacant homes there are numerous expressions complicating the understanding of what experts are talking about when they talk about vacant property. Mallach (2018) provides one of the most holistic definitions, defining vacancy as "any property that is not currently inhabited" making them synonymous with unoccupied. He proposes a multi-pronged approach to the terminology emphasizing the use of the word "abandoned" to be central to the process of defining the vacant property problem (Mallach, 2018). One additional term used in the literature is relevant to this paper: long-term vacancy. Long-term vacancy has been operationalized in various ways; we define it here as any property that has been unoccupied for six months or more (Immergluck, 2016a).

The relevant literature on vacant property can be divided into three categories. First is research that looks at the impacts of vacant and abandoned properties on communities across the country. Second is work that examines the policy responses conducted at the federal, state, or local level to the abandoned property crisis, primarily starting in the years following the height of the subprime mortgage crisis. Third is research investigating vacant property trends in different contexts.

IMPACTS OF VACANT PROPERTIES

Vacant and physically distressed properties pose many challenges for local communities, and research has looked into these challenges in significant detail. More than just an empty house, a vacant property is a sign of physical disorder, a reminder of what used to be, and can be perceived as an inconvenient indicator of a neighborhood's future. Analyses of the impact generated by vacant properties thus far have fallen into three categories: crime, health, and surrounding property values.

Crime

Foreclosures are a major cause of vacant property and as a result, several researchers have examined the connection between foreclosures and crime. One Indianapolis study found foreclosures to be a robust predictor of crime across numerous crime types, particularly in stable areas with higher rates of owner-occupancy (Stucky et. al., 2012). Similar results were found in a Chicago study focused on single-family foreclosure but more for property crime as oppose to violent crime (Immergluck and Smith, 2006). In Pittsburgh, the research found that the foreclosure itself did not cause crime, but once the foreclosure had visibly led to vacant property, then crime would have a positive relationship, leading to the conclusion that vacancy is the key driver (Cui and Walsh, 2016).

Two recent Philadelphia studies sought a closer look at the details of the association between violence and vacant places. The first was a longitudinal study conducted at the block group level comparing incidences of aggravated assault and vacant properties over five years. Using a binomial regression model, the researchers found an 18% increase in the risk of aggravated assault near spatial concentration of vacant properties (Branas et. al., 2012).

Following this, Moyer et al. (2019) conducted a randomized controlled trial study of the impact vacant land maintenance has on violence. This study assigned over 500 vacant lots into multiple treatment and control groups, with the treatment being sustained versus less sustained maintenance and lot greening interventions. The control group was no intervention at all, simulating a baseline for abandoned urban lots. Both interventions significantly reduced gun shooting instances, again showing the association between vacancy and crime (Moyer et. al., 2019).

A Detroit study focused on neighborhood disinvestment and abandonment, operationalized by more than just vacant properties, and criminal incidences (Raleigh and Galster, 2015). The authors leveraged a rich local dataset with block-level criminal report data and property data to produce a negative binomial regression model that finds an association between neighborhood indicators like population loss, vacant lots, and abandoned property condition and all types of crime, with some indicators associated with specific types of crime.

Health

There is some research on how property abandonment affects health outcomes. Sampson et al. (2017) examined the association between vacant property maintenance and mental health in two Detroit neighborhoods. Residents in target communities photographed parts of their daily life which was later analyzed. The authors identified various associations between living amongst abandoned parcels and negative health impacts.

In Memphis, Shin and Shaban-Nejad (2018) found a similar association using parcel survey data detailing property conditions. Cross-referencing the property condition data with childhood asthma data collected from a local children's hospital, the study found a statistically significant positive relationship between "blight prevalence" and childhood asthma after controlling for other socioeconomic factors.

Wang and Immergluck (2018) conducted a national study of the top fifty metros, grouping metros into a growth typology. The authors found that, in weak-growth metros with high rates of long-term vacancy, there was a strong association between vacancy and asthma as well as mental health at the neighborhood level, which is consistent with the Detroit study. Interestingly, however, other than asthma and mental health weak growth metros have little relationship with 11 other health characteristics. On the opposite end, high-growth metros were more sensitive to long-term vacancy as it relates to all 13 different health outcomes studied, which the authors attribute to the shock of an increase in vacancy resulting from the mortgage crisis relative to weak growth metros who were generally already experiencing high rates of disinvestment and vacancy before the crisis. Either way, the evidence suggests that, across the board, long-term vacancy (6 months or more), and especially very long-term vacancy (3 years or more), have statistically significant relationships to health outcomes across multiple studies in various contexts.

Surrounding Property Values

Several researchers have studied the impact of abandoned and empty properties on surrounding property values. This area was a topic of interest even before the mortgage crisis, with one of the first studies in Philadelphia in the early 2000s finding that within a 450-foot radius of a vacant house, property values decreased in the range $3,542–7,627, controlling for everything else possible (Shlay and Whitman, 2006).

There is also a very large literature on the effects of mortgage foreclosures on nearby property values. The first study on the association between foreclosures and nearby property values (Immergluck and Smith, 2006) has been cited over 500 times. While some of the effects of foreclosures may be due to foreclosures flooding a neighborhood with the supply of available homes for sale. Another possible mechanism is through the negative externality of vacant and sometimes distressed foreclosed properties on nearby values (Frame, 2010; Whitaker and Fitzpatrick, 2013; Lin et. al, 2009; Kobie and Lee, 2011).

Han (2014) looked specifically at the association between vacant properties and nearby home values. She controlled for nearby foreclosures and local housing market trends, while also examining the impact of the duration of vacancy on surrounding property values. The results indicated that, the longer a property sits empty, the greater its impact on property values and on the spatial radii of such impact (Han, 2014).

In line with Han's findings, a Cleveland study dissected property value impact by accounting for vacancy cause, looking at vacant properties, property tax delinquency, and foreclosures separately to find that a vacant and delinquent property reduces property values in a 500-foot radius by 1 to 2.7% (Whitman & Fitzpatrick, 2013). Immergluck (2016b) summarized eight studies of vacant property spillover effects and found that a vacant property impacts values within 500 feet by an average of 1.2%, and tax-foreclosed or delinquent properties impact surrounding values by an average of 3.15%.

A substantial body of research concludes vacant properties not only serve as a housing sub-market disamenity associated with a decrease in surrounding property values but are also associated with increases in crime and negative physical and mental health outcomes.

POLICY RESPONSES

When a city starts conversations around combatting the growth of vacant and abandoned properties, it is typically presented with some combination of three basic options. The first is to demolish vacant properties, especially those that are severely distressed. The second option is to create, and hopefully, bring to scale, a public or quasi-public land banking process that systematically acquires and maintains, or demolishes, vacant properties and their reuse. The third is to encourage adaptive reuse of the properties at a variety of build sizes and types ranging from single-family homes to large vacant schools, shopping centers, or factories.

Demolition

Hackworth (2019) argues that the demolition of vacant homes as part of urban “rightsizing” strategies tends to resemble the misguided urban triage strategies of the 1970s. Hackworth criticizes federal and state policies like the 2010s Hardest Hit Fund (HHF), because, in Rust Belt cities, these funds were often used for demolition that did not lead to affordable housing development or other redevelopment. HHF earmarked millions of dollars to cities that experienced the highest amounts of foreclosures during the crisis, with the majority of those dollars leveraged to finance the demolitions in cities across the country (Hackworth, 2019). The HHF was not the only federally sponsored funds subsidizing demolitions across the county. Two phases of the Neighborhood Stabilization Program allowed funds to be used for funding rehab, redevelopment, land banking, stand-alone financing or demolition. One study found, however, that in Rust Belt communities such as Cleveland and Detroit, the majority of the properties treated by specifically NSP 2 funds were demolished while Sun Belt cities like Los Angeles and Miami saw more NSP 2 money go to financing and redevelopment (Schuetz et. al., 2016). This is an important example of how policies and funding were leveraged differently for recovery in different regional markets.

Despite the dangers of large-scale demolition programs, especially those that seek to demolish entire neighborhoods of vacant homes with no follow-up redevelopment or action, some demolition efforts are aimed at more targeted demolition to reduce the negative externalities on otherwise viable blocks. Moreover, some studies find positive effects of demolition. A recent Detroit study found a statistically significant negative relationship between demolitions and crime (Larson et. al., 2019).

Demolitions have also shown to have an impact on surrounding property values. A Cleveland study found positive property value impacts in certain markets, primarily stable and functioning markets but negative impacts on property values in weak or extremely weak markets (Griswold et. al., 2014). A related Detroit study that looks at hedonic price effects of demolition found slight increases in home prices (Parades and Skidmore, 2017). If targeted demolitions can stabilize home values and slow disinvestment, then it may provide a stronger context for affordable housing and other forms of community development.

Land Banking

Land banking is a tool often used to scale up other responses such as demolition, adaptive reuse, and vacant property stabilization or maintenance by systematically acquiring, maintaining, and disposing of abandoned, vacant, or tax-delinquent properties. Though the first land bank was created in St. Louis in 1973, the majority of America's 170 public or quasi-public land banks were created via state statutes in the years following 2008 (Alexander, 2015). Land banks serve as a conduit to help reinvigorate disinvested housing submarkets and sometimes to provide affordable housing.

Land bank advocates often emphasize their ability to help inefficient land markets operate more efficiently, going as far as to say land markets "rarely, if ever" operate efficiently (Alexander & Powell, 2011). Land banks are a fundamental challenge to laissez-fare policy responses by giving the public sector the ability to control or favor various end-uses of properties, and advocates emphasize their role specifically in partnering with affordable housing developers, community development corporations, and community land trusts. Focusing on Cuyahoga County and Cleveland, Fujii (2016) used land banks there as an example of what a conduit for responsible reproductive use could look like, examining the South Broadway neighborhood as a case study. He found that property transfers involving the land bank and the Slavic Village Community Development Corporation resulted in more responsible end uses than properties transferred by real estate owned (REO) investors or banks (Fujii, 2016).

There have been significant critics of land banking strategies. In Toledo, Hackworth and Nowakowski (2015) sought to understand if a "market-first" approach of the land bank resulted in meaningfully different outcomes than by “market-only” tax delinquent property auctions. They conclude that, even in a market-first process, the objective is still to identify a productive tax-paying owner, instead of partnership-driven efforts that Fujii and other land bank advocates emphasize.

Oberle (2019) uses case studies in St. Louis, Cleveland, and Syracuse and a mixed-methods approach to argue that, while land banks pose a fundamental challenge to existing systems that generate abandonment, they fall short of a structural reorientation of urban land venturing by market actors (Oberle, 2019). Both Oberle and Hackworth question the idea that putting properties back on the tax rolls is an appropriate indicator of success.

Adaptive Reuse

With many local lawmakers of shrinking cities focused on reversing population loss, the idea of incentivizing or encouraging private redevelopment has remained a common aspect of the vacant property response conversation (Immergluck et. al., 2012). Mallach's *Bringing Buildings Back* (2010) devotes an entire chapter to ways local governments can encourage redevelopment by private actors using market-oriented tools, listing everything from carrots like tax abatement and grants to sticks such as vacant property fees or other legal action.

A recent Cincinnati study compared the spillover property value effects of three distinct policy options summarized above. Perhaps unsurprisingly, after numerous multi-variate regression models, the authors conclude that the redevelopment of vacant property produces the highest positive spillovers for surrounding property values when compared to razing the building or doing nothing. The authors go as far as to advocate that the City of Cincinnati sell properties for $1 to market actors who will rehab or redevelopment vacant structures (von Hofe et al., 2019).

VACANCY TRENDS

There is some existing research on vacant property trends in the US at different geographic levels. Molloy (2016) argues that long-term vacancy, which she defines as continuous vacancy for a period of one year, at the national level is relatively uncommon and is more correlated with indicators of housing market disinvestment than other types of vacancy.

Specifically, she finds that 13 percent of census tracts have long-term vacancy rates at least one standard deviation higher than the national average and that those census tracts comprise 39 percent of all the country's long-term vacant units. Molloy (2016) also finds that these tracts, as of 2013, were located not only in distressed inner-city or inner-ring suburban neighborhoods but also in hotter markets, high activity neighborhoods as well, creating a more complicated picture of long-term vacancy (Molloy, 2016).

Another national long-term vacancy study examined trends from 2011 to 2014 for the 50 largest metropolitan areas. Here, Immergluck finds, similar to Molloy, that during this time characterized by national housing market recovery, cities with high poverty rates and lower than average median household incomes saw sustained high rates of long-term vacancy (Immergluck, 2016a).

Trends across Metropolitan Areas of Different Housing Market Types

Because we might expect metropolitan forces, including population and housing price dynamics, to affect vacancy trends, it is helpful to examine such trends across different metropolitan areas or types of metropolitan areas. Mallach (2018) in his report, the *Empty House Next Door*, devotes a chapter to national vacancy trends across four types of cities: magnet cities, Sunbelt cities, large legacy cities, and small legacy cities. He finds that vacancy rates in legacy cities have remained substantially higher than that of Sunbelt and magnet cities, both typologies having generally experienced the benefits of the national housing market recovery in the decade following the mortgage crisis (Mallach, 2018).

Similar to the city typologies methodology employed by Mallach, Wang and Immergluck (2019) create a metropolitan typology for their study of long-term vacancy trends at the very beginning of the recovery (from 2011 to 2014) in the 50 largest metropolitan areas by growth pattern before and after the U.S. mortgage crisis. The findings vary depending on the type of metro. In weak-growth metros, vacancy is most concentrated in high African-American neighborhoods with high shares of single-family homes, again showing the difficulty of generalizing patterns to across city and metro types.

Newman et al. (2016) looked at city land growth and how it corresponds with the percentage of vacant addresses in "urban elastic" cities, finding that urban expansion or increased land growth, correlated with increased vacant addresses in a multi-variate regression model. With most other inter-metropolitan trends focusing on legacy cities or post-industrial cities, Newman et al.'s study is one of the few that touches on vacancy in sprawling, predominantly southern or western cities.

COMPARING LONG-TERM VACANCY RATES BETWEEN SUNBELT AND RUSTBELT METROS

Dataset Creation

To compare long-term vacancy, again defined as any housing unit vacant for 6 months or more, this study uses U.S. Postal Service (USPS) vacant housing data recorded by mail carriers and made publicly available at the census tract level each quarter through the U.S. Department of Housing and Urban Development (HUD). We exclude "short-term" vacant addresses (those vacant for under 6 months) because those will include many units that are for-sale, for-rent, and of less concern in terms of having negative neighborhood spillovers. The focus of this article is the recovery period following the subprime mortgage crisis. To examine the change in long-term vacancy since the crisis, we use first quarter 2012 and first quarter 2019 USPS vacancy data.[3] Using the first quarter of each year controls for seasonality issues. First quarter 2019 was the most recent first quarter data available at the time of this study.

To prepare the USPS vacancy data for analysis, we first downloaded all tract-level data that included commercial, residential, and "no-stat" records. Residential addresses include addresses for all types of residential units, including in single and multifamily properties. No-stats are addresses that are either properties in construction, completely abandoned, or somewhere in between and it is difficult to determine which no-stats fall in the vacancy category or do not (HUD Frequently Asked Questions, 2018). Therefore, the second step to data cleaning was deleting all no-stats and excluding no-stats from the calculation of a vacancy rate (that is, they were not included in either the numerator or the denominator of the rate calculation). In the third step, we summed all vacant address totals at the tract level for each category from "Vacant 6 Mos. to 12 Mos. Count – Residential and up to "Vacant 36 Mos. or Longer Count - Residential". This total was divided by the total number of residential addresses, again excluding "no stats". This gives us a long-term vacancy rate at the tract level for both observation periods, Q1 2012 and Q1 2019.

Starting from the entire universe of all tracts with USPS vacant address data available (n= 73,501), we eliminated tracts that did not fall within a Metropolitan Statistical Area (MSA), as defined by the U.S. Census Bureau. This yielded 60,456 tracts. Then, we limited the study to the largest 200 MSAs. MSAs vary greatly in size and our interest is medium-sized to large metros. Limiting the analysis to the largest 100 MSAs would exclude meaningful medium-sized metros

[3] In the third quarter data release of 2011, there was significant change in methodology and reporting, making it problematic to compare data before and after Q3 2011. The data also began to be reported in 2010 census tracts in 2012, eliminating the need to estimate changes across differing census geographies.

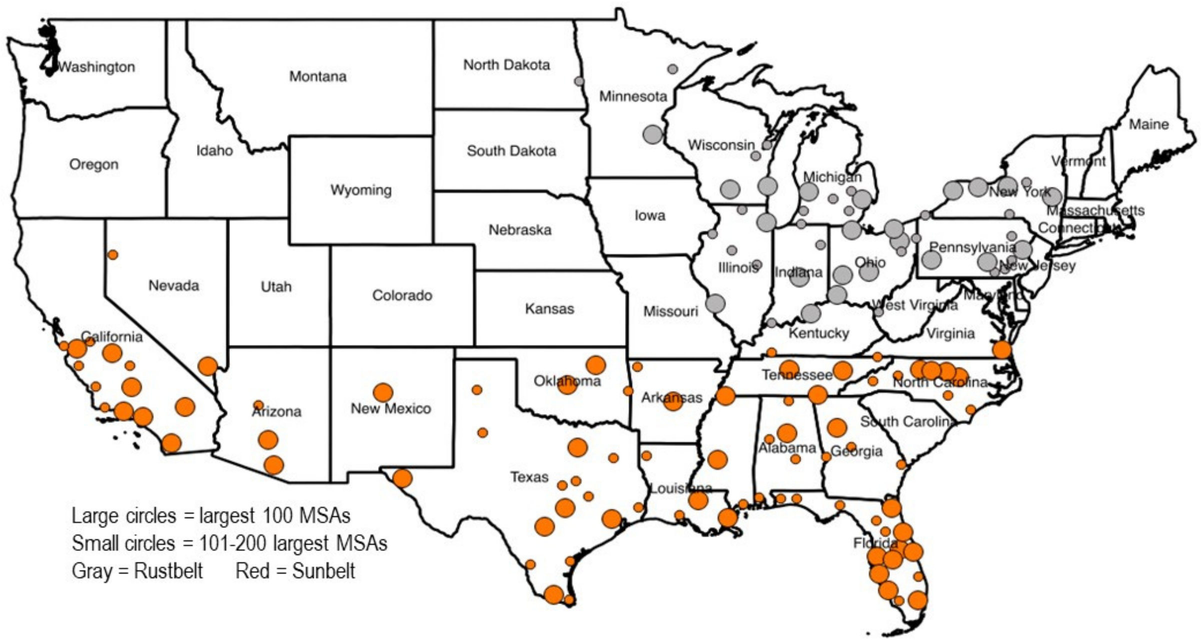
such as Youngstown, Ohio or Macon, Georgia. Deleting MSAs below the largest 200 reduced the number tracts to 54,460. The last step of selecting our sample accounted for another data anomaly in the USPS vacant address database. Between 2012 and 2019, a small number (38) of tracts had data recorded and reported for one year but not the other. Deleting those tracts from the dataset left us with 54,422 tracts in the dataset.

Our study focuses particularly on two important regions that were hit hard by the foreclosure crisis: The Rustbelt and the Sunbelt. There are no hard and fast geographic definitions for these regions, but previous literature provides definitions that we will rely on. Beginning with the Sunbelt definition, we use Stromm (2017), where she includes the states that are partially or entirely south of the 37th parallel, including North Carolina, Georgia, Alabama, Mississippi, Tennessee, Louisiana, Arkansas, Oklahoma, Texas, New Mexico, Arizona, Florida, and Nevada, and then also includes Southern California. For the Rustbelt, we use Hackworth's (2019) definition, which includes states adjacent to the Great Lakes: Indiana, Illinois, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin, as well as Louisville, Kentucky and St. Louis, Missouri because both metros spillover into these other states. If a metro was partially in a Rustbelt or Sunbelt defined state, the entire metro was included in the study. The Sunbelt region is relatively larger, with 89 MSAs and 22,572 tracts, compared to the Rustbelt, which contains 47 MSAs and 12,736 tracts. Figure 1 illustrates the locations of these MSAs.

A General Typology of Metropolitan Areas

We are particularly interested in comparing certain types of metros across both regions, especially metros that grew more slowly following the subprime crisis and were lower cost prior

Figure 1. 200 Largest Metropolitan Areas that are in the Sunbelt and Rustbelt



to the crisis. To be able to compare metros with similar market conditions across the Rustbelt and Sunbelt, a typology was devised with six categories. The typology is based on two key metropolitan characteristics: 1) the median housing value, to identify low- versus high-cost metros; and 2) changes in housing prices and population over the recovery period. To create this typology, we used a universe of all MSAs in the country (n = 383) and not just the two regions or largest metros.

To categorize metros by housing cost level, we used the median home value for owner-occupied homes from the American Community Survey (ACS) at the MSA level for 2018.[4] After examining the distribution of home values at the metro-level, $200,000 was chosen as the cut-off point between low- and high-cost metros. This was slightly higher than the mean value at the

[4] The median home value figures were from the 2018 5-year American Community Survey estimates.

metro level, but the data is substantially skewed, and this figure corresponds to the top third of MSAs by median value.

To categorize metros by post-recession growth, we used two key variables: the Federal Housing Finance Agency (FHFA) Housing Price Index (HPI) change between 2011 and 2018 and the U.S. Census' Population Estimate Program (PEP) from 2011 to 2018; 2018 was the most recent year of data available from the U.S. Census bureau.[5] After calculating home price and population changes, we used the following rules to categorize MSAs into three distinct groups. Group 1, low-growth MSAs, had a population change percentage below the average of all MSAs (4.59%) and an HPI change below the all-MSA average (27.58%). Group 2, mixed-growth metros, were MSAs that fell below the average on either population growth or housing price change, but not both. Group 3, high-growth metros, were MSAs that were above the all-MSA average for both variables. Combining these three categories with the low and high-cost categories, results in six metropolitan types, as shown in Table 1. The table indicates how many of the medium-sized and large metros in the Rustbelt and Sunbelt fall into each of the six metro types. The use of these housing cost and growth classifications will allow us to compare long-term vacancy rates among metros with similar housing costs and growth trajectories.

[5] From 2011 to 2018, delineations of MSAs by the U.S. Office of Management and Budget (OMB) changed. Therefore, we manually cross-walked the 2011 data using the 2018 definition and county data to create spatially comparable 2011 data for calculation of the change variable. The MSA definitions are based on the 2018 OMB definition.

Table 1. Cross-Tabulation of Cost and Growth Types for Sunbelt and Rustbelt

	Low-growth	Mixed-growth	High-growth	TOTALS
Low-cost	52 *(54.7% of LC)* *(89.7% of LG)*	22 *(23.2% of LC)* *(78.6% of MG)*	21 *(22.1% of LC)* *(44.7% of HG)*	Total LC = 95 *(100%)*
High-cost	6 *(15.8% of HC)* *(10.3% of LG)*	6 *(15.8% of HC)* *(21.4% of MG)*	26 *(68.4% of HC)* *(55.3% of HG)*	Total HC = 38 *(100%)*
TOTALS	Total LG= 58 *(100%)*	Total MG= 28 *(100%)*	Total HG= 47 *(100%)*	Total MSAs = 133 *(100%)*

VACANCY LEVEL RESULTS

Aggregate Changes in Tract Vacancy Levels from 2012 to 2019

To better understand the change in vacancy from 2012 to 2019, we first define five levels of vacancy: low, moderate, high, very high, and extreme. The "low" category includes all census tracts that had a vacancy rate from 0% to 0.9%. The "moderate" frequency includes all census tracts with vacancy rates ranging from 1% to 3.9%. The "high" classification includes tracts with a 4% to 7.9% vacancy rate. The "very high" category ranges from 8% to 13.9%, and the "extreme" category is any tract over 14%. Table 2 shows that a large majority of all census tracts in the largest 200 Metros falls into either the low or moderate categories, which account for 76.1% of all tracts in 2012 and 82.5% of all tracts in 2019. A categorical approach allows us to focus on tracts with high, very high, or extreme levels of vacancy, especially the latter two categories, and how the numbers of such tracts changed over the 2012 to 2019 period. The top section of the table shows that for the 200 largest metros, the share of very high and extreme vacancy tracts declined, but not dramatically, decreasing from 9.4% to 7.5% of all tracts in these metros. These are the tracts that most likely present serious challenges for local communities and where negative spillovers of vacancies are most likely to constitute sizable problems.

Table 2. Census Tracts by Vacancy Level, 2012 and 2019, 200 Largest MSAs

	Year (Quarter)	Low	Moderate	High	Very High	Extreme
All (n = 200 MSAs & 54,422 tracts)	**2012 (Q1)**	19,632 *(36.07%)*	21,747 *(39.98%)*	7,896 *(14.51%)*	3,367 *(6.19%)*	1,770 *(3.25%)*
	2019 (Q1)	26,764 *(49.18%)*	18,115 *(33.29%)*	5,438 *(9.99%)*	2,511 *(4.61%)*	1,594 *(2.93%)*

	Year (Quarter)	Low	Moderate	High	Very High	Extreme
Sunbelt (n = 86 MSAs & 22,572 tracts)	**2012 (Q1)**	8,126 *(36.00%)*	8,372 *(37.09%)*	3,799 *(16.83%)*	1,664 *(7.37%)*	611 *(2.71%)*
	2019 (Q1)	11,626 *(51.51%)*	7,024 *(31.12%)*	2,448 *(10.85%)*	1,025 *(4.54%)*	449 *(1.99%)*

	Year (Quarter)	Low	Moderate	High	Very High	Extreme
Rustbelt (n = 47 MSAs & 12,736 tracts)	**2012 (Q1)**	3,302 *(25.93%)*	5,289 *(41.53%)*	2,159 *(16.95%)*	1,080 *(8.48%)*	906 *(7.11%)*
	2019 (Q1)	4,256 *(33.42%)*	4,811 *(37.77%)*	1,711 *(13.43%)*	1,024 *(8.04%)*	934 *(7.33%)*

Table 2 also shows that, in Sunbelt metros, the share of tracts that had very high or extreme levels of vacancy declined over the recovery period, with the combined share dropping from about 10.1% in 2012 to about 6.5% in 2019. There was also a substantial net shift from higher vacancy levels to the low level, with the latter increasing from 36.0% to 51.5%. Thus, while it appears that the greatest net reduction in vacancy occurred through a shift from moderate-to-high levels downward, there was also some shift from very high and extreme categories to lower levels. It is important to note, however, that this table only represents a comparison of gross patterns across all tracts and does not speak to the number of tracts that transition from higher-to-lower categories (or vice versa). This will be discussed more below.

Similarly, the bottom row of Table 2 shows that, in Rustbelt metros, the share of tracts that had very high or extreme levels of vacancy did not decline substantially over the recovery period, with the combined share dropping only from about 15.6% in 2012 to about 15.4% in

2019. It is noteworthy that the share of tracts in the Rustbelt in these very high and extreme categories at the late stages of the recovery were more than 50% higher than the comparable share in the Sunbelt at the *beginning* of the recovery period. By the end of the study period, the share of tracts in these two categories was 2.4 times as large in the Rustbelt than in the Sunbelt. In the case of the Rustbelt, the net reduction in vacancy occurred almost entirely through a shift from moderate-to-high levels downward, and not from the very high and extreme categories. Very high and extreme levels of long-term vacancy appear to have been significantly more persistent in the Rustbelt than in the Sunbelt. Nonetheless, a nontrivial number of such tracts persist in the Sunbelt despite the region's stronger recovery overall.

Changes in Tract Vacancy Levels by MSA Housing Cost and Growth Type

The section above compared changes in tract vacancy levels for larger Sunbelt and Rustbelt metros, without breaking out different types of metros within these two regions. While Rustbelt metros have not tended to grow as fast as Sunbelt metros during the recovery period, there are different types of metros in both regions. The Sunbelt region is particularly heterogeneous, in part because it contains more metros but also because it covers a substantially larger geography. To at least partially address such heterogeneity among metros within these two regions, we break out vacancy levels for the 2012 and 2019 periods across the six different metro types that we identified earlier. These categories include low-cost, low growth; low-cost, mixed-growth; low-cost, high-growth; high-cost, low-growth; high-cost, mixed-growth; and high-cost, high-growth. Figure 2 indicates which categories the larger metros fall into in the Sunbelt and Rustbelt regions.

Figure 2. Large Sunbelt and Rustbelt Metros by Cost and Growth Type

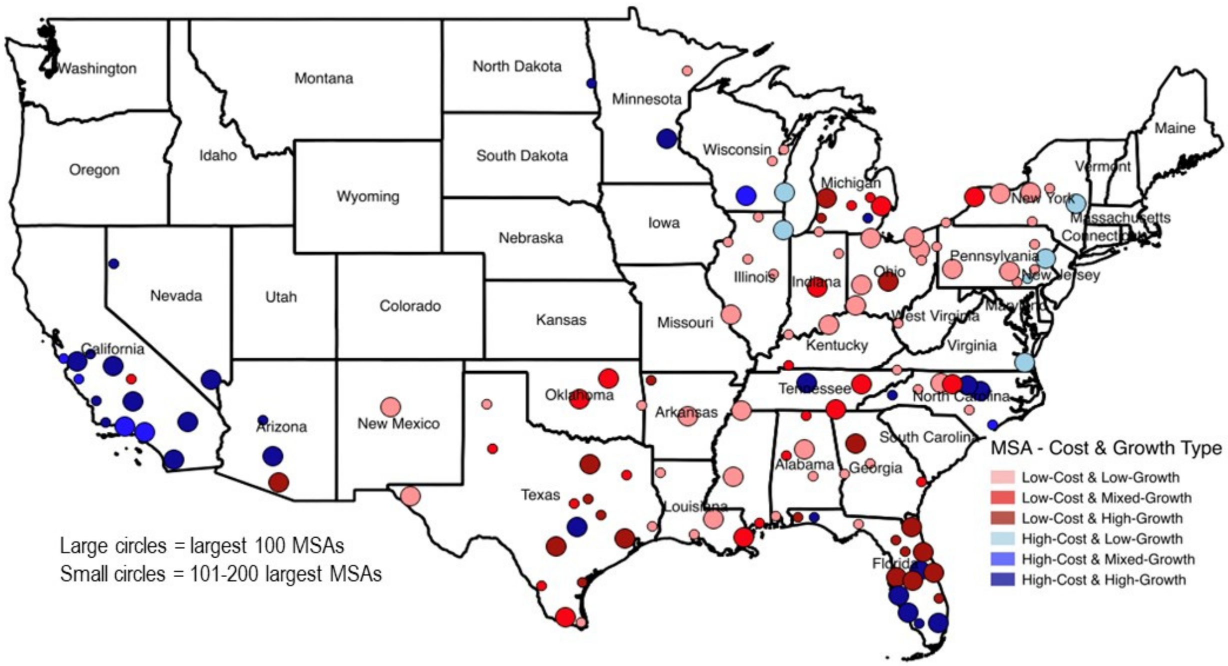


Figure 2 shows that, as expected, lower-growth metros tend to be more common in the Rustbelt than in the Sunbelt. At the same time, neither region – especially the Sunbelt – is homogeneous in this respect. There are some high-growth metros in the Rustbelt, including Grand Rapids, Columbus and Minneapolis. Conversely, there are low-growth metros in the Sunbelt, including Birmingham, Memphis, and Jackson, among others.

The first cost-growth type we analyze is low-cost, low-growth metros. This category includes 58 of the 200 largest MSAs, with 30 in the Rustbelt and 22 in the Sunbelt. These are metros with a median home value less than $200,000 and are below average in both population and HPI change from 2011 to 2018. At a national level, these metros showed less movement to the lowest category compared to other metros, with small decreases at the moderate and high categories. There was little change in the share of tracts in the very high and extreme categories.

This share remained remarkably stable, increasing very slightly. Suggesting that in low-cost, low-growth metros, the problems of hypervacancy have persisted despite the national recovery.

Table 3 provides a breakout of tract-level vacancy levels for larger low-cost-low growth metros. The first thing to note is that while low-cost, low-growth metros are often assumed to be primarily located in the Rustbelt, only slightly over half of such MSAs are in fact Rustbelt metros. Moreover, 22 Sunbelt metros fall into this category, accounting for 38% of such metros among the 200 largest MSAs. Rustbelt metros account for 52% of such metros. When comparing low-cost, low-growth metros in the Rustbelt and the Sunbelt, the table shows that these metros saw similarly modest shifts towards lower vacancy levels, despite the broader national housing market recovery. Moreover, the low-cost, low-growth metros in both regions saw very little change in the share of tracts at very high or extreme vacancy levels. Thus, these sorts of metros tend to exhibit persistent hypervacancy regardless of region of the country.

Table 3. Low-Cost, Low-Growth MSAs: Census Tracts by Vacancy Level, 2012, 2019

	Year (Quarter)	Low	Moderate	High	Very High	Extreme
All (n = 58 MSAs & 8,740 tracts)	**2012 (Q1)**	2,454 *(28.08%)*	3,122 *(35.72%)*	1,655 *(18.94%)*	883 *(10.10%)*	626 *(7.16%)*
	2019 (Q1)	2,988 *(34.19%)*	2,821 *(32.28%)*	1,398 *(16.00%)*	891 *(10.19%)*	642 *(7.35%)*

	Year (Quarter)	Low	Moderate	High	Very High	Extreme
Sunbelt (n = 22 MSAs & 2,687 tracts)	**2012 (Q1)**	951 *(35.39%)*	793 *(29.51%)*	466 *(17.34%)*	280 *(10.42%)*	197 *(7.33%*
	2019 (Q1)	1,074 *(39.97%)*	731 *(27.21%)*	412 *(15.33%)*	262 *(9.75%)*	208 *(7.74%)*

	Year (Quarter)	Low	Moderate	High	Very High	Extreme
Rustbelt (n = 30 MSAs & 5,595 tracts)	**2012 (Q1)**	1,344 *(24.02%)*	2,187 *(39.09%)*	1,088 *(19.45%)*	560 *(10.01%)*	416 *(7.44%)*
	2019 (Q1)	1,755 *(31.37%)*	1,958 *(35.00%)*	893 *(15.96%)*	574 *(10.26%)*	415 *(7.42%)*

However, a substantially larger share of Rustbelt metros fell into this category than was the case in the Sunbelt. As a result, overall, there are more tracts at these high vacancy levels in the Rustbelt, and this pattern persisted over the recovery period.

The low-cost, mixed-growth category includes 32 MSAs among the largest 200, with 17 in the Sunbelt and 5 in the Rustbelt. As shown in Table 4, in the Sunbelt there was a substantial increase (9.4 percentage points) over the recovery period in the share of tracts falling into the low-vacancy category, while the corresponding shift in the Rustbelt was trivial. Moreover, while the share of tracts at very high and extreme vacancy levels dropped some in Sunbelt metros (from 13.7% to 11.8%), the share in Rustbelt metros did not appreciably change. So, within this metropolitan type, we begin to see somewhat stronger recovery in Sunbelt metros as compared to

Table 4. Low-Cost, Mixed-Growth MSAs: Census Tracts by Vacancy Level, 2012, 2019

	Year (Quarter)	Low	Moderate	High	Very High	Extreme
All (n = 32 MSAs & 5,801 tracts)	**2012 (Q1)**	1,823 *(31.43%)*	1,976 *(34.06%)*	1,029 *(17.74%)*	530 *(9.14%)*	443 *(7.64%)*
	2019 (Q1)	2,107 *(36.32%)*	1,970 *(33.96%)*	821 *(14.15%)*	455 *(7.84%)*	448 *(7.72%)*

	Year (Quarter)	Low	Moderate	High	Very High	Extreme
Sunbelt (n = 17 MSAs & 2,470 tracts)	**2012 (Q1)**	724 *(29.31%)*	891 *(36.07%)*	516 *(20.89%)*	255 *(10.32%)*	84 *(3.40%)*
	2019 (Q1)	957 *(38.74%)*	818 *(33.12%)*	403 *(16.32%)*	217 *(8.79%)*	75 *(3.04%)*

	Year (Quarter)	Low	Moderate	High	Very High	Extreme
Rustbelt (n = 5 MSAs & 2,258 tracts)	**2012 (Q1)**	608 *(26.93%)*	785 *(34.77%)*	328 *(14.53%)*	203 *(8.99%)*	334 *(14.79%)*
	2019 (Q1)	621 *(27.50%)*	816 *(36.14%)*	280 *(12.40%)*	188 *(8.33%)*	353 *(15.63%)*

Rustbelt ones. This may be partly due to noticeable economic differences between the metros within this category across the two regions.

The low-cost, high-growth category includes 26 MSAs among the largest 200, with 18 in the Sunbelt and three in the Rustbelt. Moreover, the Sunbelt accounts for 80% of the tracts in this type of metro nationally, so that the Sunbelt and the national results look very similar. Across both regions, this metro type has seen large changes, including large increases in the share of tracts falling into the low vacancy category. As indicated in Table 5, in both regions, the share of tracts in high, very high and extreme categories dropped substantially; the decline in such metros was 14.8 percentage points in the Sunbelt and 7.4 percentage points in the Rustbelt. This is one metro type where the ending share of higher vacancy tracts ended up somewhat higher in the Sunbelt than in the Rustbelt (18.5% versus 15.8%), which could raise questions around how growth in the Sunbelt differed from Rustbelt growth.

Table 5. Low-Cost, High-Growth MSAs: Census Tracts by Vacancy Level, 2012, 2019

	Year (Quarter)	Low	Moderate	High	Very High	Extreme
All (n = 26 MSAs & 8,096 tracts)	**2012 (Q1)**	2,529 *(31.24%)*	2,966 *(36.64%)*	1,618 *(19.99%)*	737 *(9.10%)*	246 *(3.04%)*
	2019 (Q1)	3,862 *(47.70%)*	2,722 *(33.62%)*	972 *(12.01%)*	391 *(4.83%)*	149 *(1.84%)*

	Year (Quarter)	Low	Moderate	High	Very High	Extreme
Sunbelt (n = 18 MSAs & 6,477 tracts)	**2012 (Q1)**	1,882 *(29.06%)*	2,442 *(37.70%)*	1,374 *(21.21%)*	608 *(9.39%)*	171 *(2.64%)*
	2019 (Q1)	3,043 *(46.98%)*	2,239 *(34.57%)*	803 *(12.40%)*	297 *(4.59%)*	95 *(1.47%)*

	Year (Quarter)	Low	Moderate	High	Very High	Extreme
Rustbelt (n = 3 MSAs & 690 tracts)	**2012 (Q1)**	274 *(39.71%)*	256 *(37.10%)*	88 *(12.75%)*	42 *(6.09%)*	30 *(4.35%)*
	2019 (Q1)	372 *(53.91%)*	209 *(30.29%)*	58 *(8.41%)*	33 *(4.78%)*	18 *(2.61%)*

The remaining three figures explore the various high-cost metro types, beginning with low-growth MSAs. Because there are fewer high-cost metros, in some categories, the number of MSAs gets quite small. For example, in the high-cost, low-growth category, shown in Table 6, the Sunbelt only has one metro represented, Virginia Beach, VA-NC. In this category, the Sunbelt and Rustbelt constitute only a little over a quarter of all tracts. Five (5) Rustbelt metros fall into this category. In this type of metros, there was a significant increase in low-vacancy tracts, and some decline in high-vacancy tracts, but the share of very high and extreme vacancy tracts remained roughly similar over time. Because there was only one such metro in the Sunbelt, we do not attempt to analyze differences across regions within this metro type.

Table 6. High-Cost, Low-Growth MSAs: Census Tracts by Vacancy Level, 2012, 2019

	Year (Quarter)	Low	Moderate	High	Very High	Extreme
All (n = 21 MSAs & 12,109 tracts)	**2012 (Q1)**	4,583 *(37.85%)*	5,341 *(44.11%)*	1,397 *(11.54%)*	541 *(4.47%)*	247 *(2.04%)*
	2019 (Q1)	6,070 *(50.13%)*	4,385 *(36.21%)*	978 *(8.08%)*	429 *(3.54%)*	247 *(2.04%)*

	Year (Quarter)	Low	Moderate	High	Very High	Extreme
Sunbelt (n = 1 MSAs & 423 tracts*)	**2012 (Q1)**	211 *(49.88%)*	146 *(34.52)*	47 *(11.11%)*	15 *(3.55%)*	4 *(0.95%)*
	2019 (Q1)	232 *(54.85%)*	134 *(31.68%)*	41 *(9.69%)*	13 *(3.07%)*	3 *(0.71%)*

	Year (Quarter)	Low	Moderate	High	Very High	Extreme
Rustbelt (n = 5 MSAs & 3,123 tracts)	**2012 (Q1)**	757 *(24.17%)*	1,476 *(47.13%)*	538 *(17.18%)*	243 *(7.76%)*	118 *(3.77%)*
	2019 (Q1)	992 *(31.67%)*	1,399 *(44.67%)*	389 *(12.42%)*	210 *(6.70%)*	142 *(4.53)*

*Virginia Beach, VA-NC is the only Sunbelt MSA that is high-cost, low-growth.

The fifth category is high-cost, mixed-growth metros. Madison, Wisconsin is the only metro in the Rustbelt in this category, so generalizations about the region here are limited. Five (5) Sunbelt metros fall into this category. Table 7 shows that there was a marked increase in the share of tracts in such metros in the low-vacancy category, and this was larger in the Sunbelt than nationally. Across both regions and nationally, only a small share of tracts fell into the highest levels of long-term vacancy, with less than 100 tracts falling into the two highest levels in 2012 nationally, and less than 60 in 2019.

Table 7. High-Cost, Mixed-Growth MSAs: Census Tracts by Vacancy Level, 2012, 2019

	Year (Quarter)	Low	Moderate	High	Very High	Extreme
All (n = 11 MSAs & 5,331 tracts)	**2012 (Q1)**	3,205 *(60.12%)*	1,849 *(34.68%)*	184 *(3.45%)*	64 *(1.20%)*	29 *(0.54%)*
	2019 (Q1)	4,065 *(76.25%)*	1,082 *(20.30%)*	125 *(2.34%)*	35 *(0.66%)*	24 *(0.45%*

	Year (Quarter)	Low	Moderate	High	Very High	Extreme
Sunbelt (n = 5 MSAs & 3,296 tracts)	**2012 (Q1)**	1,934 *(58.58%)*	1,234 *(37.44%)*	91 *(2.76%)*	25 *(0.76%)*	12 *(0.36%)*
	2019 (Q1)	2,642 *(80.16%)*	594 *(18.02%)*	37 *(1.12%)*	9 *(0.27%)*	14 *(0.42%)*

	Year (Quarter)	Low	Moderate	High	Very High	Extreme
Rustbelt* (n = 1 MSAs & 131 tracts)	**2012 (Q1)**	64 *(48.85%)*	60 *(45.80%)*	6 *(4.58%)*	1 *(0.76%)*	0 *(0.00%)*
	2019 (Q1)	88 *(67.18%)*	39 *(29.77%)*	2 *(1.53%)*	2 *(1.53%)*	0 *(0.00%)*

*Madison, WI is the only Rustbelt metro that is high-cost, mixed-growth

The last category of metros is high-cost, high-growth MSAs. There are significantly more metros in the Sunbelt in this category (23) compared to just 3 in the Rustbelt. In both the Sunbelt and the Rustbelt, Table 8 indicates that these metros saw very large increases in the share of tracts that were low-vacancy, increasing by 17.4 percentage points in the Sunbelt and 18.6 percentage points in the Rustbelt. Similar to the mixed-growth results, there were relatively small shares of tracts at very high and extreme vacancy levels, even in 2012, although the shares did decline over the seven-year period. Notably, the 2019 shares of tracts at very high and extreme vacancy levels in such metros in the Rustbelt (2.5%) were actually slightly lower than in the Sunbelt (3.9%), but both shares were small.

Table 8. High-Cost, High-Growth MSAs: Census Tracts by Vacancy Level, 2012, 2019

	Year (Quarter)	Low	Moderate	High	Very High	Extreme
All (n = 52 MSAs & 14,345 tracts)	**2012 (Q1)**	5,038 *(35.12%)*	6,503 *(45.33%)*	2,013 *(14.03%)*	612 *(4.27%)*	179 *(1.25%)*
	2019 (Q1)	7,672 *(53.48%)*	5,135 *(35.80%)*	1,144 *(7.97%)*	310 *(2.16%)*	84 *(0.59%)*

	Year (Quarter)	Low	Moderate	High	Very High	Extreme
Sunbelt (n = 23 MSAs & 7,219 tracts)	**2012 (Q1)**	2,424 *(33.58%*	2,866 *(39.70%)*	1,305 *(18.08%)*	481 *(6.66%)*	143 *(1.98%)*
	2019 (Q1)	3,678 *(50.95%)*	2,508 *(34.74%)*	752 *(10.42%)*	227 *(3.14%)*	54 (0.75%)

	Year (Quarter)	Low	Moderate	High	Very High	Extreme
Rustbelt (n = 3 MSAs & 930 tracts)	**2012 (Q1)**	2,424 *(33.58%*	2,866 *(39.70%)*	1,305 *(18.08%)*	481 *(6.66%)*	143 *(1.98%)*
	2019 (Q1)	3,678 *(50.95%)*	2,508 *(34.74%)*	752 *(10.42%)*	227 *(3.14%)*	54 (0.75%)

The results above suggest that the greater increase in low-vacancy tracts and greater decline in very high and extreme vacancy tracts in the Sunbelt as compared to the Rustbelt is primarily associated with the fact that a larger share of Sunbelt metros fall into higher-growth categories. Once the cost-level and growth trajectory of metros is accounted for, differences between Rustbelt and Sunbelt metros diminish. It appears to be the case that the stronger recovery of most Sunbelt metropolitan housing markets is associated with sharper declines in hypervacancy, as measured here by the numbers of very high and extreme vacancy tracts.

Nonetheless, it remains the case that a significant share of low-cost, low-growth metros are located in the Sunbelt, and these generally had similar vacancy trajectories during the 2012-2019 period as low-cost, low-growth metros in the Rustbelt.

ANALYSIS OF TRACTS EXPERIENCING CHANGES IN VACANCY LEVEL

We next look at the number and share of neighborhoods that shift from higher to lower levels of vacancy. This part of the analysis answers two related questions. How many neighborhoods (tracts) saw a decline in their level of vacancy from 2012 to 2019, and to what degree did they decline? Alternatively, we calculate how many tracts experienced *increases* in their vacancy levels and the extent of such increases.

The Net Number of Tracts Shifting to Higher or Lower Vacancy Levels

We first calculate the net number of tracts in each metropolitan area that shifted from higher to lower levels of vacancy, the general trend expected during the 2012 to 2019 recovery. We then subtract the number of tracts that moved in the opposite direction, from lower to higher levels of vacancy. The result is the *net* number of tracts shifting to lower vacancy levels over the period. Then, for each metro, we identified when the net number of tracts shifting in one direction or the other amounted to more than 25 percent of all tracts. Table 9 identifies the five MSAs that saw a net shift of 25% of more of tracts towards higher vacancy levels. Four of these

Table 9. Net Number of Tracts Changing from Lower to Higher Vacancy Level (2012 to 2019), where Number of Tracts Experiencing such Change >25% of All Tracts in MSA

Metro	Net # Tracts Shifting Lower-to-Higher Vacancy	Total Tracts	Percent	Cost	Growth	Region
Huntington-Ashland, WV-KY-OH	37	92	40.2%	Low	Low	Rustbelt
Flint, MI	48	131	36.6%	Low	Mixed	Rustbelt
Binghamton, NY	18	65	27.7%	Low	Low	Rustbelt
Peoria, IL	25	97	25.8%	Low	Low	Rustbelt
Clarksville, TN-KY	16	63	25.4%	Low	Mixed	Sunbelt

five are Rustbelt metros. Table 10 identifies 35 metros that saw a net shift of 25% or more of tracts toward lower vacancy levels. Twenty-nine of these are Sunbelt metros. Far more metros saw large shares of their neighborhoods shift downward to a lower vacancy level over the recovery period as compared to those seeing substantial shifts toward higher vacancy levels. Moreover, while most of the metros seeing large shifts to higher levels of vacancy were Rustbelt metros, the bulk of metros experiencing large net downward shifts in vacancy were Sunbelt metros.

To identify very large vacancy changes at the tract level, Tables 11 and 12 examine net change in tracts shifting categories, but this time these tables only consider tracts that shifted from one of the lower levels (low or moderate vacancy) to one of the highest levels (very high or extreme vacancy), or vice-versa. Both tables list those metropolitan areas where the net number of tracts shifting from lower-to-very high (or very high-to-lower) levels amounted to over 10% of the tracts in the metro. Table 11 indicates that there are five metros where over 10% of the tracts shifted from lower to very high vacancy levels, with the three highest being in the Rustbelt. In Table 12, which lists metros where over 10% of tracts saw very large declines in vacancy

Table 10. Net Number of Tracts Changing from Higher to Lower Vacancy Level (2012 to 2019), where Number of Tracts Experiencing such Change >25% of All Tracts in MSA

Metro	Net # Tracts Shifting Higher-to-Lower Vacancy	Total Tracts	Percent	Cost	Growth	Region
Ocala, FL	50	61	82.0%	Low	High	Sunbelt
Gainesville, FL	46	69	66.7%	Low	High	Sunbelt
Port St. Lucie, FL	51	78	65.4%	Low	High	Sunbelt
Augusta-Richmond County, GA-SC	67	119	56.3%	Low	Mixed	Sunbelt
Pensacola-Ferry Pass-Brent, FL	54	96	56.3%	Low	High	Sunbelt
Jacksonville, FL	144	258	55.8%	Low	High	Sunbelt
Crestview-Fort Walton Beach-	28	52	53.8%	High	High	Sunbelt
Cincinnati, OH-KY-IN	262	500	52.4%	Low	Low	Rustbelt
Savannah, GA	46	88	52.3%	Low	Mixed	Sunbelt
McAllen-Edinburg-Mission, TX	58	113	51.3%	Low	Mixed	Sunbelt
College Station-Bryan, TX	26	52	50.0%	Low	High	Sunbelt
Las Vegas-Henderson-Paradise,	221	487	45.4%	High	High	Sunbelt
Riverside-San Bernardino-Ontario,	361	817	44.2%	High	High	Sunbelt
Tallahassee, FL	35	84	41.7%	Low	Low	Sunbelt
Atlanta-Sandy Springs-Alpharetta,	372	951	39.1%	Low	High	Sunbelt
San Antonio-New Braunfels, TX	172	456	37.7%	Low	High	Sunbelt
Miami-Fort Lauderdale-Pompano	450	1212	37.1%	High	High	Sunbelt
Macon-Bibb County, GA	22	60	36.7%	Low	Low	Sunbelt
Santa Maria-Santa Barbara, CA	32	88	36.4%	High	High	Sunbelt
Waco, TX	20	57	35.1%	Low	High	Sunbelt
Orlando-Kissimmee-Sanford, FL	136	389	35.0%	High	High	Sunbelt
Houston-The Woodlands-Sugar	369	1067	34.6%	Low	High	Sunbelt
Corpus Christi, TX	33	97	34.0%	Low	High	Sunbelt
Phoenix-Mesa-Chandler, AZ	335	987	33.9%	High	High	Sunbelt
Austin-Round Rock-Georgetown,	118	350	33.7%	High	High	Sunbelt
Erie, PA	23	71	32.4%	Low	Low	Rustbelt
Tyler, TX	13	41	31.7%	Low	Mixed	Sunbelt
Reno, NV	33	110	30.0%	High	High	Sunbelt
San Diego-Chula Vista-Carlsbad,	187	626	29.9%	High	High	Sunbelt
Grand Rapids-Kentwood, MI	56	200	28.0%	Low	High	Rustbelt
Brownsville-Harlingen, TX	24	86	27.9%	Low	Low	Sunbelt
Louisville/Jefferson County, KY-IN	81	299	27.1%	Low	Low	Rustbelt
Tampa-St. Petersburg-Clearwater,	187	738	25.3%	Low	High	Sunbelt
Minneapolis-St. Paul-Bloomington,	198	784	25.3%	High	High	Rustbelt
Ann Arbor, MI	25	100	25.0%	High	High	Rustbelt

Table 11. Net Number of Tracts Changing from Low-Mod to Very High-Extreme Vacancy (2012 to 2019), where Number of Tracts >10% of All Tracts in MSA

Metro	Net Change	Total Tracts	Percent	Cost	Growth	Region
Youngstown-Warren-Boardman, OH-PA	25	155	16.1%	Low	Low	Rustbelt
Huntington-Ashland, WV-KY-OH	13	92	14.1%	Low	Low	Rustbelt
Duluth, MN-WI	11	86	12.8%	Low	Low	Rustbelt
Clarksville, TN-KY	8	63	12.7%	Low	Mixed	Sunbelt
Kingsport-Bristol, TN-VA	8	75	10.7%	Low	Low	Sunbelt

Table 12. Net Number of Tracts Changing from Very High-Extreme to Low-Mod Vacancy (2012 to 2019), where Number of Tracts >10% of All Tracts in MSA

Metro	Net Change	Total Tracts	Percent	Cost	Growth	Region
Ocala, FL	15	61	24.6%	Low	High	Sunbelt
Augusta-Richmond County, GA-SC	25	119	21.0%	Low	Mixed	Sunbelt
Gainesville, FL	12	69	17.4%	Low	High	Sunbelt
Crestview-Fort Walton Beach-Destin, FL	9	52	17.3%	High	High	Sunbelt
College Station-Bryan, TX	9	52	17.3%	Low	High	Sunbelt
Port St. Lucie, FL	12	78	15.4%	Low	High	Sunbelt
Pensacola-Ferry Pass-Brent, FL	12	96	12.5%	Low	High	Sunbelt
Waco, TX	7	57	12.3%	Low	High	Sunbelt
Corpus Christi, TX	11	97	11.3%	Low	High	Sunbelt
Spartanburg, SC	7	69	10.1%	Low	Mixed	Sunbelt

levels, all ten metros are in the Sunbelt. Moreover, six of the 10 metros are in Florida, one of the "sand states" hit hardest by the foreclosure crisis.

THE RACIAL AND ECONOMIC CHARACTERISTICS OF HYPERVACANT NEIGHBORHOODS

We next turn to the racial and economic characteristics of neighborhoods at different vacancy levels in the Sunbelt and the Rustbelt, at the beginning and end of the study period. We are particularly interested in the characteristics of tracts with very high and extreme vacancy rates. Table 13 compares the racial compositions and poverty rates of tracts at different vacancy levels using the 2011 and 2018 five-year American Community Survey. The 2011 ACS data are

Table 13. Mean Racial, Ethnic and Poverty Characteristics of Tracts by Vacancy Level

	2012*				2019*			
	% Black	% Latinx	% White	% in Poverty	% Black	% Latinx	% White	% in Poverty
Total Tracts								
200 MSAs	15.2%	17.4%	70.1%	14.8%	15.4%	19.0%	68.8%	14.7%
Sunbelt	15.4%	25.9%	68.0%	16.1%	15.6%	27.9%	67.2%	16.0%
Rustbelt	16.7%	7.4%	75.0%	15.7%	17.1%	8.5%	73.5%	15.6%
Low Vacancy								
200 MSAs	8.5%	15.7%	75.2%	9.7%	9.7%	19.2%	72.0%	10.6%
Sunbelt	8.6%	24.8%	71.5%	11.5%	9.8%	29.1%	69.4%	12.4%
Rustbelt	3.9%	3.8%	89.9%	7.4%	5.3%	5.3%	86.2%	8.0%
Moderate Vacancy								
200 MSAs	12.5%	19.2%	72.1%	13.6%	14.7%	20.1%	70.4%	14.9%
Sunbelt	14.2%	29.7%	68.4%	15.7%	17.4%	29.0%	67.7%	17.2%
Rustbelt	8.9%	7.7%	82.3%	11.5%	11.4%	10.0%	78.4%	12.6%
High Vacancy								
200 MSAs	21.4%	18.5%	66.7%	20.5%	23.9%	18.7%	64.3%	21.7%
Sunbelt	20.7%	23.6%	67.5%	20.5%	23.9%	25.2%	64.9%	22.5%
Rustbelt	22.4%	11.1%	67.9%	20.3%	25.0%	10.7%	65.1%	21.7%
Very High Vacancy								
200 MSAs	35.6%	16.5%	53.9%	27.6%	36.3%	15.1%	53.7%	28.0%
Subset	30.9%	20.7%	59.0%	25.4%	35.1%	19.0%	55.7%	27.0%
Rustbelt	42.3%	10.0%	48.4%	30.9%	38.5%	10.6%	51.7%	29.6%
Extreme Vacancy								
200 MSAs	56.6%	10.6%	35.1%	35.1%	56.8%	10.9%	34.5%	35.0%
Sunbelt	47.9%	15.3%	43.3%	31.5%	51.1%	13.9%	40.8%	31.5%
Rustbelt	65.4%	7.1%	25.6%	39.4%	61.9%	8.9%	29.3%	38.2%

*Note: 2012 demographic characteristics are calculated using 2011 5-year ACS data; 2019 demographic characteristics are calculated using 2018 5-year ACS data.

used to describe the Q1 2012 tracts and the 2018 ACS data are used to describe the Q1 2019 tracts.

Low-vacancy tracts in the Rustbelt tend to have substantially lower Black and, especially, Latinx populations than low-vacancy tracts in the Sunbelt.[6] The poverty rates of low-vacancy tracts in the Sunbelt are also substantially higher. Over the recovery period, the mean percent Black and Latinx figures rose among low-poverty tracts in both regions, as did the mean poverty rates.

High vacancy tracts tend to look similar across Rustbelt and Sunbelt, both at the beginning of the period and at the end. They tend to have substantial Black and Latinx populations, with those percentages increasing by 2019, especially in the Sunbelt. The mean poverty rate of high vacancy tracts also increased a bit, from 20.5% to 22.5% in the Sunbelt, and from 20.3% to 21.7% in the Rustbelt. Due to smaller Latinx populations overall, high vacancy tracts in the Rustbelt had substantially lower Latinx populations than those in Sunbelt, and they declined slightly over the recovery period, while the Sunbelt high-vacancy tracts saw a small increase in the mean Latinx share.

Very high vacancy tracts tend to have substantially larger Black populations in the Rustbelt than in the Sunbelt, although that difference declined by 2019. In 2019, the very high vacancy tracts in the Sunbelt had increased from 30.9% Black to 35.1% Black, while declining from 42.3% to 38.5% Black in the Rustbelt. There was again, a large difference in Latinx shares between the regions, again due to the overall smaller Latinx population among Rustbelt metros. The poverty rates of very high vacancy tracts remained high over the period, at 27% in Sunbelt very high vacancy tracts and 29.6% in corresponding Rustbelt tracts.

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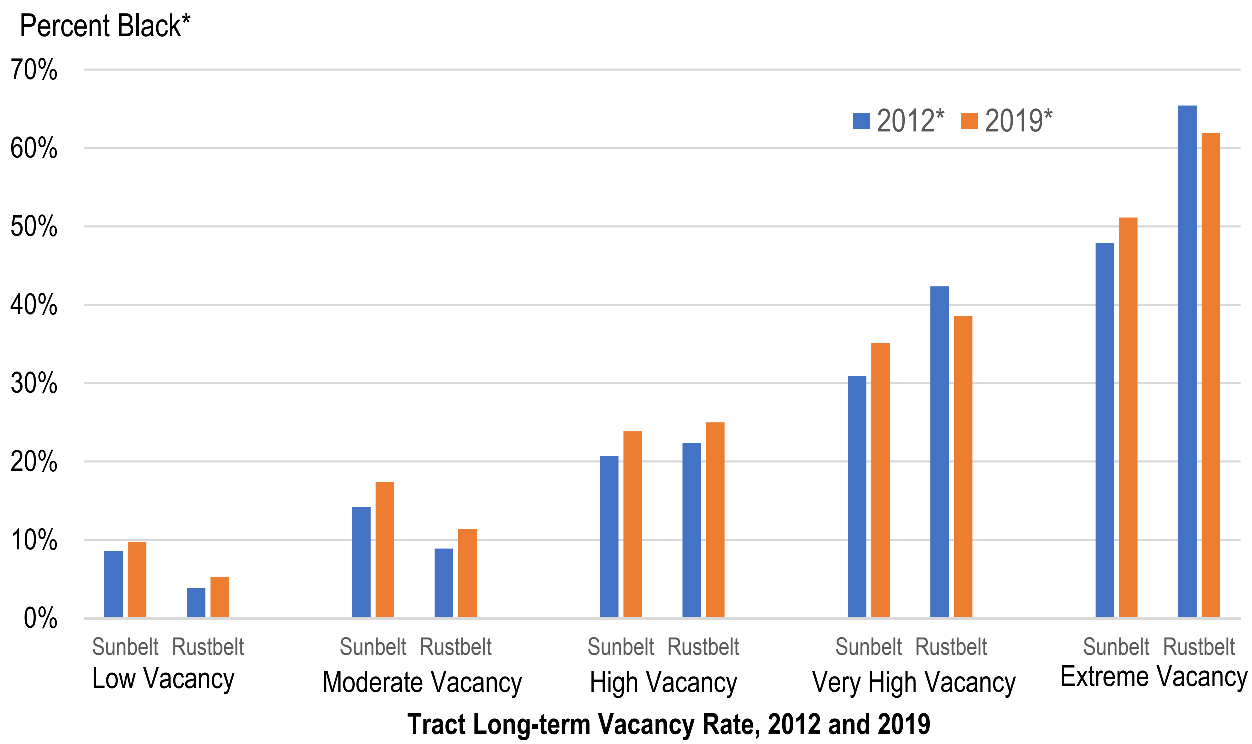
[6] Rustbelt metros tend to have substantially smaller Latinx populations than Sunbelt metros. Of all tracts among the 200 largest metros, the mean Latinx share was 27.9% in 2018 in the Sunbelt versus 8.5% in the Rustbelt.

Extreme vacancy tracts in both regions tended to have large Black populations, with means ranging from 47.9% in the Sunbelt to 65.4% in the Rustbelt. While the mean Black population for such tracts increased in the Sunbelt, it actually declined significantly in the Rustbelt, although remained high, at 61.9%. The poverty rates of extreme vacancy tracts are high, and higher in the Rustbelt, with a mean of 31.5% in the Sunbelt and 38.2% in the Rustbelt. These figures held fairly steady over the recovery period.

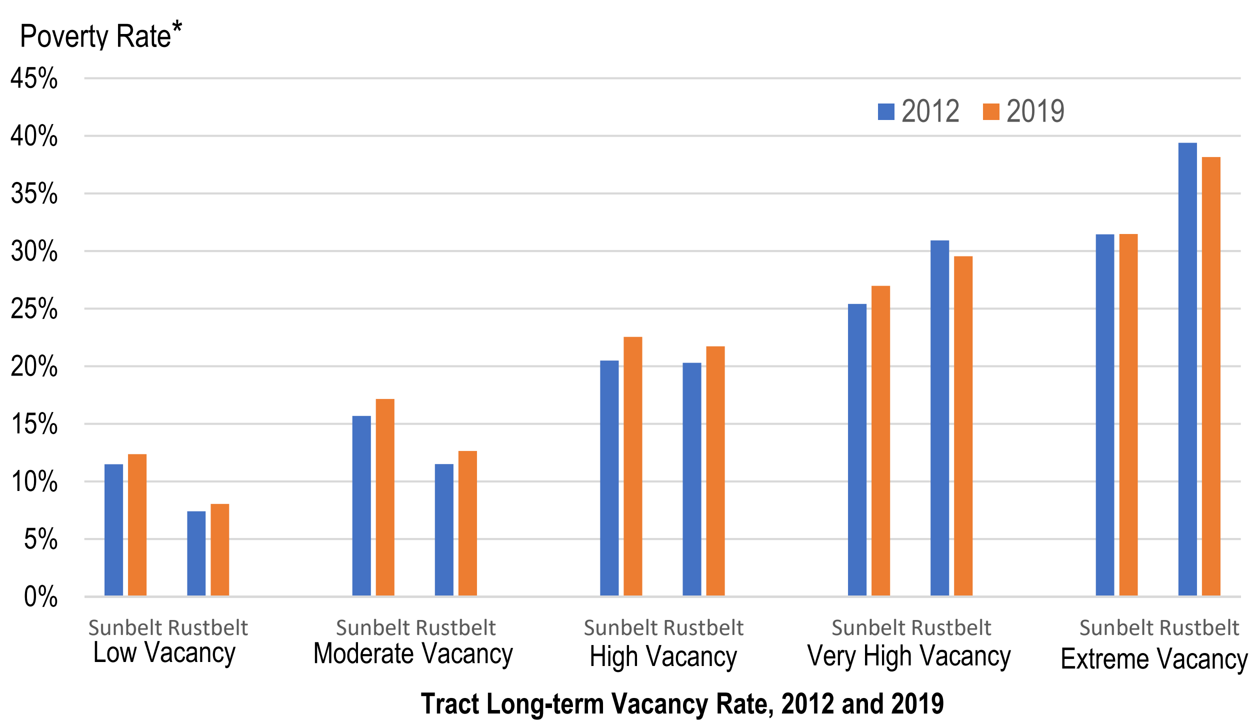
Figures 3 and 4 illustrate the strong relationships between high levels of vacancy and the racial and poverty characteristics of census tracts in both the Sunbelt and the Rustbelt. Figure 3 shows that very high and extreme vacancy tracts, whether in the Sunbelt or the Rustbelt tend to have substantial Black populations, although Rustbelt tracts in these categories have substantially larger mean Black percentages. It is also notable that, in the Rustbelt, the low and moderate-vacancy tracts have lower Black populations. Overall, Figure 3 suggests that, while the relationship between vacancy level and percentage Black is strong in both regions, it is stronger in the Rustbelt. This might be somewhat expected given the generally higher levels of Black segregation in the Rustbelt (Frey, 2018). Figure 4 shows that very high and extreme vacancy tracts, again both in the Sunbelt and in the Rustbelt, tend to have higher poverty rates than tracts at lower vacancy levels. Once again, this relationship is somewhat stronger in Rustbelt than in Sunbelt metros.

Figure 3. Mean Percent Black of Census Tracts of Different Vacancy Levels, 2012 and 2019



*Note: 2012 racial data is from ACS 2011; 2019 racial data is from ACS 2018

Figure 4. Mean Poverty Rate of Census Tracts of Different Vacancy Levels, 2012 and 2019



*Note: 2012 poverty data is from ACS 2011; 2019 poverty data is from ACS 2018

CONCLUSION

The U.S. housing market recovery that began around 2012 brought with it increased housing demand and generally lower levels of housing vacancy. This recovery, however, was highly uneven, with population and home values growing much more in some regions than others. In this paper, we have focused on medium-sized and large metropolitan areas in two regions of the country – the Sunbelt and the Rustbelt – that were generally hit particularly hard by the foreclosure crisis and that experienced high levels of long-term housing vacancy at the beginning of the 2010s. In particular, we focus on the extent to which the number of neighborhoods in these metros with very high (8 to 13.9%) or extreme (14% or higher) levels of long-term vacancy declined by 2019. We also examine the racial and poverty characteristics of such neighborhoods. It is in these neighborhoods where the cumulative negative impacts of vacancy are expected to be the most severe and where the problem of vacancy is often the hardest to solve.

Overall, we found that in the Sunbelt, in contrast to the Rustbelt, the share of tracts that had very high or extreme levels of vacancy declined over the 2012 to 2019 period, from about 10.1% to 6.5%. There was also a sizable increase in the share of tracts that fell into the low-vacancy (under 1%) category, from 36.0% to 51.5%. Meanwhile, in the Rustbelt metros, the very high and extreme vacancy tracts remained roughly constant, falling only from 15.6% to 15.4%. Notably, the share of tracts at these very high vacancy levels was still more than 50% higher in the Rustbelt in 2019 than in the Sunbelt in 2012, *before* the broader national recovery. And the Rustbelt share in these two highest vacancy categories in 2019 was 2.4 times the Sunbelt share in 2019. The Rustbelt did see a net downward shift in vacancy, but it was primarily from tracts in the moderate and high levels shifting to the moderate or low levels while the share of tracts at the more extreme levels remained roughly constant.

Despite the greater persistence of hypervacant neighborhoods in the Rustbelt, the results above also show that such neighborhoods do exist in the Sunbelt to a significant degree. This is primarily because the Sunbelt also includes a substantial number of low-cost, low-growth metros, the type that tend to have the highest numbers of very high and extreme vacancy census tracts. Of the 58 larger metros in this category, 22 (38%) are located in the Sunbelt, while 30 (52%) are located in the Rustbelt. In both regions, these types of metros saw their shares of tracts with very high or extreme vacancy levels remain about constant over the 2012 to 2019 period, at about 17.5%. This potentially supports the idea that larger regional factors are not as impactful on hypervacancy as metro-level market factors, such as cost or growth.

Low-growth metros do comprise a substantially smaller share of the Sunbelt metros than of the Rustbelt metros. For example, there are 41 high-growth metros in the Sunbelt, but only 6 in the Rustbelt. Since Sunbelt metros tend to be higher-growth, they tended to see larger declines in vacancy, including declines in the number of very high and extreme vacancy tracts.

We identified the net number of census tracts that shifted vacancy levels – either upward or downward – and found that, while only five larger MSAs saw a large (25%) net shift of tracts toward higher vacancy levels during the 2012 to 2019 period, 35 MSAs saw a large net shift toward lower vacancy levels. Moreover, while all five of the increasing-vacancy MSAs were located in the Rustbelt, 29 of the 35 decreasing-vacancy ones were located in the Sunbelt. Florida metros, in particular, tended to experience some of the largest net shifts from higher to lower vacancy levels.

Finally, we found that very high and extreme vacancy tracts tended to have large Black and poor populations, especially in Rustbelt metros. In the Rustbelt metros in 2019, the mean Black population was 38.5% in very high vacancy tracts and 61.9% in extreme vacancy tracts. The shares were somewhat lower, but still high, in Sunbelt metros, at 35.1% and 51.1%, respectively. The poverty rate for extreme vacancy tracts exceeded 38% in the Rustbelt in 2019 and 31% in the Sunbelt. At the same time, the low-vacancy tracts in the Rustbelt tended to have very small Black populations (mean = 5.3%) and low poverty rates (mean = 8%), while the corresponding means were somewhat higher in the Sunbelt, low-vacancy tracts (mean = 9.8% Black and 12.4% poverty). Overall, the association between Black share and poverty rate, on the one hand, and vacancy level, on the other, was stronger in Rustbelt than Sunbelt metros.

This study demonstrates that metropolitan housing market trends are strongly related to the resilience of neighborhoods when it comes to long-term vacancy rates. Whether in the Rustbelt or the Sunbelt, metropolitan growth and cost structures during the 2012 to 2019 period appear to have had a strong influence on whether, and to what degree, the very high and extreme levels of neighborhood vacancy persisted over this period. Moreover, the findings here challenge any oversimplified notion that weak market regions are predominantly located in the Rustbelt and shows that, in weaker-growth Sunbelt metros, high-levels of persistent hypervacancy remained a problem throughout the broader national recovery.

REFERENCES

Accordino, J., & Johnson, G. T. (2000). Addressing the vacant and abandoned property problem. *Journal of Urban Affairs*, 22(3), 301-315.

Alexander, F. S., & Powell, L. A. (2011). Neighborhood stabilization strategies for vacant and abandoned properties. *Zoning and Planning Law Report*, 34(8), 11-179.

Alexander, F. S. (2015). Land banks and land banking: 2nd Edition. Flint, MI: Center for Community Progress.

Branas, C. C., Rubin, D., & Guo, W. (2012). Vacant properties and violence in neighborhoods. *ISRN Public Health*.

Cui, L., & Walsh, R. (2015). Foreclosure, vacancy and crime. *Journal of Urban Economics*, 87, 72-84.

Fujii, Y. (2016) Spotlight on the main actors: How land banks and community development corporations stabilize and revitalize Cleveland neighborhoods in the aftermath of the foreclosure crisis. *Housing Policy Debate* 26 (2): 296–315.

Frame, W. S. (2010). Estimating the effect of mortgage foreclosures on nearby property values: A critical review of the literature. *Economic Review*, 95.

Frey, W. (2018). Black-white segregation edges downward since 2000, Census shows. Brookings Institution. December 17. https://www.brookings.edu/blog/the-avenue/2018/12/17/black-white-segregation-edges-downward-since-2000-census-shows/.

Griswold, N., Calnin, B., Schramm, M., Anselin, L., & Boehnlein, P. (2014). Estimating the effect of demolishing distressed structures in Cleveland, OH, 2009–2013: Impacts on real estate equity and mortgage-foreclosure. Griswold Consulting Group.

Hackworth, J., & Nowakowski, K. (2015). Using market-based policies to address market collapse in the American Rust Belt: The case of land abandonment in Toledo, Ohio. *Urban Geography*, 36(4), 528-549.

Hackworth, J. (2019). *Manufacturing decline: How racism and the conservative movement crush the American Rust Belt*. Columbia University Press.

Han, H. S. (2014). The impact of abandoned properties on nearby property values. *Housing Policy Debate,* 24(2), 311-334.

Immergluck, D. (2010). Neighborhoods in the wake of the debacle: Intrametropolitan patterns of foreclosed properties. *Urban Affairs Review*, 46(1), 3-36.

Immergluck, D. (2016a). Examining changes in long-term neighborhood housing vacancy during the 2011 to 2014 US national recovery. *Journal of Urban Affairs*, 38(5), 607-622.

Immergluck, D. (2016b). The cost of vacant and blighted properties in Atlanta: A conservative analysis of service and spillover costs. Center for Community Progress.

Immergluck, D., Lee, Y. S., & Terranova, P. (2012). Local vacant property registration ordinances in the U.S.: an analysis of growth, regional trends, and some key characteristics. August 12. Available at SSRN: https://ssrn.com/abstract=2130775 or http://dx.doi.org/10.2139/ssrn.2130775

Immergluck, D., & Smith, G. (2006). The impact of single-family mortgage foreclosures on neighborhood crime. *Housing Studies*, 21(6), 851-866.

Kobie, T. F., & Lee, S. (2011). The spatial-temporal impact of residential foreclosures on single-family residential property values. *Urban Affairs Review*, 47(1), 3-30.

Larson, M., Xu, Y., Ouellet, L., & Klahm IV, C. F. (2019). Exploring the impact of 9398 demolitions on neighborhood-level crime in Detroit, Michigan. *Journal of Criminal Justice*, 60, 57-63.

Lin, Z., Rosenblatt, E., & Yao, V. W. (2009). Spillover effects of foreclosures on neighborhood property values. *The Journal of Real Estate Finance and Economics*, 38(4), 387-407.

Mallach, A. (2010). *Bringing buildings back: From abandoned properties to community assets*: 2nd Edition. National Housing Institute.

Mallach, A. (2018). The empty house next door: Understanding and reducing vacancy and hypervacancy in the United States. https://www.lincolninst.edu/sites/default/files/pubfiles/empty-house-next-door-full.pdf

Molloy, R., 2016. Long-term vacant housing in the United States. *Regional Science and Urban Economics*, *59*, pp.118-129.

Moyer, R., MacDonald, J. M., Ridgeway, G., & Branas, C. C. (2019). Effect of remediating blighted vacant land on shootings: a citywide cluster randomized trial. *American Journal of Public Health,* 109(1), 140-144.

Newman, G., Gu, D., Kim, J. H., & Li, W. (2016). Elasticity and urban vacancy: A longitudinal comparison of US cities. *Cities,* 58, 143-151.

Oberle, P. (2019). Valuing Vacancy: Land Banking and Property Governance in the US Rust Belt (Doctoral dissertation, Syracuse University).

Paredes, D., & Skidmore, M. (2017). The net benefit of demolishing dilapidated housing: The case of Detroit. *Regional Science and Urban Economics*, 66, 16-27.

Raleigh, E., & Galster, G. (2015). Neighborhood disinvestment, abandonment, and crime dynamics. *Journal of Urban Affairs*, 37(4), 367-396.

Sampson, N., Nassauer, J., Schulz, A., Hurd, K., Dorman, C., & Ligon, K. (2017). Landscape care of urban vacant properties and implications for health and safety: Lessons from photovoice. *Health & Place*, 46, 219-228.

Schuetz, J., Spader, J., & Cortes, A. (2016). Have distressed neighborhoods recovered? Evidence from the neighborhood stabilization program. *Journal of Housing Economics*, 34, 30-48.

Shin, E. K., & Shaban-Nejad, A. (2018). Urban Decay and Pediatric Asthma Prevalence in Memphis, Tennessee: Urban Data Integration for Efficient Population Health Surveillance. *IEEE Access*, 6, 46281-46289.

Shlay, A. B., & Whitman, G. (2006). Research for democracy: Linking community organizing and research to leverage blight policy. *City & Community*, 5(2), 153-171.

Strom, E. (2017). How place matters: A view from the Sunbelt. *Urban Affairs Review*, 53(1), 197-209.

Stucky, T. D., Ottensmann, J. R., & Payton, S. B. (2012). The Effect of Foreclosures on Crime in Indianapolis, 2003–2008. *Social Science Quarterly*, 93(3), 602-624.

U.S. Department of Housing and Urban Development. (2018). USPS Vacancy Data: Frequently Asked Questions. https://www.huduser.gov/portal/datasets/usps/FAQ_2012.pdf

von Hofe, R., Parent, O., & Grabill, M. (2019). What to do with vacant and abandoned residential structures? The effects of teardowns and rehabilitations on nearby properties. *Journal of Regional Science*, 59(2), 228-249.

Wang, K., & Immergluck, D. (2018). The geography of vacant housing and neighborhood health disparities after the US foreclosure crisis. *Cityscape*, 20(2), 145-170.

Wang, K. and Immergluck, D., (2019). Housing vacancy and urban growth: explaining changes in long-term vacancy after the US foreclosure crisis. *Journal of Housing and the Built Environment*, *34*(2), pp.511-532.

Whitaker, S., & Fitzpatrick IV, T. J. (2013). Deconstructing distressed-property spillovers: The effects of vacant, tax-delinquent, and foreclosed properties in housing submarkets. *Journal of Housing Economics*, 22(2), 79-91.