

**Shifting and Persisting Neighborhood Hierarchies:  
Immigrant Influx and the Spread of Gentrification in the Twenty-First Century**

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**Abstract:** As gentrification has become widespread across cities throughout the US over the last two decades, the growth of new immigrants and shifting patterns of immigrant settlement and profiles have reshaped metropolitan contexts. Few studies have examined the relationship between the influx of immigrants to cities and their neighborhoods and how gentrification unfolds in cities. Analysis based on US Census and American Community Survey data from 1990 to 2014 shows a negative relationship during the 1990s but a positive relationship after 2000 between immigration and the prevalence of gentrification across cities. At the neighborhood-level, the results reflect two dynamics of neighborhood change occurring. First, we find limited preferences for diversity governed by a racial hierarchy in the spread of gentrification whereby the influx of immigrants in black neighborhoods is associated with increased odds of gentrification but decreased odds in other neighborhood ethnoracial compositions. Second, we find evidence of housing competition dynamics such that, in high immigration cities, immigrant influx is negatively associated with the likelihood of gentrification. This process is racially patterned during the 1990s but not the 2000s. Together, these dynamics explain the higher likelihood of gentrification in predominantly black neighborhoods during the 2000s relative to other neighborhoods. The findings suggest that new patterns of residential stratification underlie urban change in the twenty-first century while old mechanisms persist.

**Keywords:** gentrification, immigration, race and ethnicity, residential stratification, urban change

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## **Shifting and Persisting Neighborhood Hierarchies:**

### **Immigrant Influx and the Spread of Gentrification in the Twenty-First Century**

Whereas central city depopulation and decline and suburbanization characterized US metropolitan areas for most of the twentieth century, metropolitan areas in the late twentieth century have undergone widespread demographic shifts as immigration rates increased significantly, the Hispanic and Asian population grew, and gentrification became increasingly widespread (Ehrenhalt 2013). Immigration and gentrification rapidly reshaped the urban landscape in the US at the turn of the century and continue to do so today, having the potential to shift the once durable structure of neighborhood inequality by race and class (Sampson 2012). Existing theories of urban change primarily stem from the dynamics taking place during most of the twentieth century, but new theories of neighborhood change and stability that underlie residential stratification by race and class are needed to better understand the dynamics of urban change today.

Gentrification—the process by which low-income central-city neighborhoods experience investment and renewal and an in-migration of middle- and upper-class residents (Smith 1998: 198)—occurred across several US cities since the mid-twentieth century, but, beginning in the late 1990s, the process became much more rapid and widespread compared with the past (Connor et al. 2018; Hackworth and Smith 2001). Distinct from before, the recent wave of gentrification is characterized by its spread beyond downtown neighborhoods into “economically risky” ones, greater involvement by larger investors and developers and the state, and the decline

in effective resistance (Hackworth and Smith 2001; Lees 2008; Wacquant 2008).<sup>1</sup> In line with these observations, others have noted the increased prevalence of gentrification occurring in minority, particularly black, neighborhoods (Goetz 2010; Owens 2012; Freeman and Cai 2015; Hyra 2017). While scholars have developed theoretical models around gentrification (e.g., Smith 1996; Ley 1996), this scholarship relies largely on gentrification of the past and undertheorizes the role of ethnoracial stratification and its relationship to other concurrent processes of urban change.

Coinciding with the rapid and widespread expansion of gentrification, immigration, particularly from Latin American and Asian countries, increased rapidly. Immigrant settlement patterns once comprised of movement to central city cores in a handful of gateway cities where enclaves formed, housing was affordable, and jobs were nearby (Park, Burgess, and McKenzie 1925). Over the last few decades, however, immigrant settlement patterns reflect movement to the suburbs, other affordable neighborhoods throughout central cities, and to a broader range of cities (Logan, Zhang, and Alba 2002; Singer 2004; Massey 2008; Singer et al. 2009; Wilson and Singer 2011; Hall 2012). This influx and spread of Hispanic and Asian immigrants alters the ethnoracial compositions of the neighborhoods and cities to which they move; the local economies of these places by repopulating areas, engaging in entrepreneurial activity, and increasing local consumption; and the social conditions of these places, such as reducing crime (Winnick 1990; Muller 1993; Sampson 2012; McDonald, Hipp, and Gill 2013). At the same time, the influx of immigrants to metropolitan areas also increases demand for affordable

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<sup>1</sup> Some scholarship has highlighted gentrification occurring in rural towns or suburbs or in already middle-class urban neighborhoods (Brown-Saracino 2017); however, for the purposes of this study, we draw on a traditional conception of gentrification as an urban phenomenon to observe the relationship between broad urban changes over time.

housing and neighborhoods. Some scholars have demonstrated the implications of the growing Hispanic and Asian populations on our understandings of residential stratification (e.g., Fong and Shibuya 2005; Logan and Zhang 2010), but few studies directly incorporate this transformation with the widespread gentrification occurring during the same period (Waldinger 1989; Vigdor 2014; Hwang 2016).

No studies to our knowledge systematically examine this relationship across the US. This study contributes to theory and research on urban change, immigration, and residential stratification by examining the extent to which immigration is associated with contemporary gentrification. In doing so, we assess the relationship between gentrification and the influx of immigrants to cities, more broadly, as well as the relationship within neighborhoods. We also examine if these relationships differ depending on the ethnoracial composition of neighborhoods, given the strength of residential stratification by ethnoracial composition throughout US cities.

The results suggest a new and emerging pattern of uneven development that characterizes cities in the twenty-first century. The findings show a negative relationship between recent immigrants and the prevalence of gentrification across cities during the 1990s but a strong positive relationship after 2000. At the neighborhood-level, the results reflect limited preferences for diversity governed by a racial hierarchy in explaining patterns of gentrification. We find that the influx of immigrants to black neighborhoods is associated with increased odds of gentrifying but decreased odds in other neighborhoods. Finally, the results show that the lack of an influx of immigrants to neighborhoods in cities with high levels of recent immigration is positively associated with gentrification, suggesting distinct sorting processes between gentrifiers and recent immigrants among low-cost neighborhoods. This process is racially patterned during the 1990s but not the 2000s. For predominantly black neighborhoods, the combination of this

process and the positive effect of immigrant influx on black neighborhoods explains their higher prevalence of gentrification during the 2000s compared to other neighborhoods after adjusting for neighborhood- and metropolitan-level characteristics.

### **Gentrification from Past to Present**

While the gentrification of the 1970s and 1980s was relatively slow, located around central business districts and universities, and often reflected an expansion from state-led efforts, such as tax incentives and property condemnation around these areas (Hackworth and Smith 2001), gentrification began to spread and intensify more rapidly within many cities and to more cities across the US during the late 1990s (Hackworth and Smith 2001). Moreover, although gentrification once avoided predominantly black neighborhoods (Smith 1996; Freeman 2009; Hwang 2016), scholars have documented an increased prevalence of gentrification in these neighborhoods (Goetz 2010; Freeman and Cai 2015; Hyra 2017). Explanations of these shifts draw primarily on changes in the political, economic, and cultural landscape, as well as shifts in the overall demographic makeup of the population (for a review, see Hwang and Lin [2016]). These explanations include: the increased availability of capital through the deregulation of financial markets (Hackworth and Smith 2001; Wyly, Atia, and Hammel 2004; Hyra 2012); changes in preferences to urban living (Couture and Handbury 2016); changes in the social and economic conditions of central city neighborhoods, such as increased jobs and amenities and large-scale crime declines (Baum-Snow and Hartley 2016; Ellen, Horn, and Reed 2017); and delayed household formation and homeownership coupled with a large birth cohort of millennials (Myers 2016). To explain the increased prevalence in minority neighborhoods in particular, explanations point to: an increased focus of federal housing policy to de-concentrate

poverty with the demolition of large-scale public housing projects and transformation into mixed-income developments (Wyly and Hammel 1999; Hackworth and Smith 2001; Goetz 2010; Hyra 2012); changing racial attitudes (Hyra 2017); and the growth of middle-class minorities who often drive gentrification initially in predominantly minority neighborhoods (Bostic and Martin 2003; Freeman 2006; Pattillo 2007). While these explanations are all likely contributors to the spread of gentrification to more neighborhoods and cities compared to the past, few studies directly discuss or examine whether and how the influx of immigrants is associated with the recent wave of gentrification.

### **Immigration and New Paths of Neighborhood Change**

Although the foreign-born population significantly increased in the US from 9.7 million to 19.8 million from 1970 to 1990 with the passage of the 1965 Hart-Celler Act, which eased immigration restrictions from specific regions, the foreign-born population increased substantially during the 1990s at unprecedented levels, growing to 31.1 million by 2000 and to 42.4 million by 2014 (Singer 2004).<sup>2</sup> Since the 1990s are from Asia or Latin America, but the share of immigrants from Mexico declined precipitously over the period, as more immigrants from other countries increased (Massey 2008). Between 2008 and 2009, the share of Asian arrivals surpassed that of Latino arrivals (Waters et al. 2015). Asian immigrants continue to include a large number of highly educated, professional, and entrepreneurial migrants while Hispanic immigrants – specifically Mexicans – continue to be largely low-skilled labor migrants (Portes and Rumbaut 2006; Singer et al. 2009; Waters et al. 2016).

Unlike the 1970s and 1980s when a handful of cities—namely Chicago, New York, and

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<sup>2</sup> Author's calculations from US Censuses and the 2014 American Community Survey.

San Francisco—served as the primary destinations for immigrants, immigrant settlement patterns have diversified beyond the traditional receiving urban areas, and socioeconomic differences among immigrants influence their settlement patterns (Singer 2004; Massey 2008; Hall et al. 2011; Wilson and Singer 2011). Beginning in the 1990s, a substantial share of foreign-born residents lived in areas with little prior history of immigration, such as Dallas, TX, Washington, DC, and Las Vegas, NV, and such patterns have become more prevalent in the 2000s as immigrant communities form in these places, economic opportunities continued to expand, and the sheer numbers of immigrants grow (Singer 2004). Metropolitan areas with diverse local economies, ranging from knowledge-based industries (e.g., technology) to construction and low-end services, experienced significant immigrant growth and attracted both high- and low-skilled immigrants seeking employment opportunities (Massey 2008; Singer et al. 2009). In absolute terms, however, larger numbers of new immigrants still migrate to traditional destinations (Massey 2008; Singer et al. 2009). The trend of dispersion to new destinations is more pronounced among Hispanics than Asians, particularly during the 2000s (Frey 2014), and traditional gateways continue to have the largest absolute gains in their Asian populations (Frey 2011; Flippen and Kim 2015).

Moreover, while more immigrants now live in the suburbs compared with central cities, in traditional gateways and in the largest metropolitan areas, immigrants are still more likely to live in central cities than the suburbs compared to the overall population (Wilson and Singer 2011; Frey 2014; Waters et al. 2016). New immigrants traditionally moved to the urban cores of metropolitan areas, which serve as a base for low-SES residents for eventual assimilation (Logan et al. 2002; Singer et al. 2009), but metropolitan areas experiencing the highest rates of immigrant growth, such as Atlanta, GA, Austin, TX, and Portland, OR, have sprawling suburban

areas with low relative housing costs, perceived good schools, low crime, established networks of other immigrants, and often major employment centers (Price and Singer 2009; Singer et al. 2009).

Nonetheless, in central cities across the 100 largest metropolitan areas in the US, Asian and Hispanic populations are making up for both non-Hispanic white and black population losses (Frey 2014). Cities with historically large black populations, such as Detroit, MI, Chicago, IL, and New York, NY, experienced significant black population losses, making Hispanics the largest minority group in these cities (Singer et al. 2009). Overall, the unprecedented growth of the immigrant population, the growing diversity of immigrants, and their changing settlement patterns characterize immigration in the US since the 1990s.

### **Immigration and Gentrification**

The similar timing in which gentrification and immigration increased and spread to more cities and neighborhoods, coupled with findings from past studies focusing separately on immigration and gentrification, suggest several ways in which these phenomena are related. Scholarship on the early wave of gentrification that took place during the 1970s and 1980s implicates the rise of immigrants. For example, several ethnographic accounts of gentrifying neighborhoods note the prior presence of Asian and Hispanic immigrant groups, including well-known examples of gentrified neighborhoods such as Brooklyn's Williamsburg (Susser 1982) and Chicago's Wicker Park (Lloyd 2006). Across 23 US cities, Hwang (2015, 2016) finds that neighborhoods in cities with relatively higher shares of foreign-born residents have a higher probability of gentrifying and that the presence of Asians during the early and mid-1970s positively predicted gentrification. Nonetheless, neighborhoods that served as ethnic enclaves were unlikely to



gentrify (Hwang 2016).

Past research provides some insights on the mechanisms by which the influx of immigrants are associated with the gentrification of these neighborhoods. First, the rise of immigrants replenished the population of depopulating cities and neighborhoods as non-Hispanic white and black populations continue to grow in the suburbs in decline in cities (Winnick 1990; Frey 2011). Their influx established commercial businesses in vacant storefronts and increased the demand for housing that may have otherwise remained vacant (Lin 1998; Muller 1993; Winnick 1990). Immigrants continue to revitalize local economies through entrepreneurship and increased demand for housing and consumption (Vigdor 2014). In addition, the in-migration of immigrants is negatively associated with violent crime (McDonald, Hipp, and Gill 2013; Sampson 2012; Vigdor 2014), and studies cite large crime declines across cities since the mid-1990s as an important contributor to increased gentrification (Kirk and Laub 2010; Ellen et al. 2017). Thus, immigrants may stabilize and improve the social and economic conditions of neighborhoods that may make neighborhoods or central cities, more broadly, more attractive for gentrification.

Second, the large increase in the Hispanic and Asian populations associated with the growth of immigrants, especially since the 1990s, alters the ethnoracial compositions of many neighborhoods that may in turn make neighborhoods more attractive for gentrification. Evidence on the preferences of gentrifiers document both an aversion to predominantly minority, especially black, neighborhoods in this early period (Laska and Spain 1980; Smith and Williams 1986; Smith 1996) and an aversion to homogenously white, middle- and upper-class neighborhoods that characterized the suburbs (Zukin 1987; Lloyd 2006; Brown-Saracino 2009). Neighborhoods are now increasingly multiethnic (Zhang and Logan 2017), potentially bringing

the ethnoracial diversity that appeals to gentrifiers' preferences. While much of this literature focuses on individuals' neighborhood preferences, these preferences certainly interact with neighborhood selection processes by developers, investors, and the state (Smith 1996; Hwang and Sampson 2014).

The influx of immigrants at a large scale may also deter gentrification. Blalock (1967) argues that, rather than increasing racial integration, larger shares of minorities exacerbate preferences to avoid minority neighbors. Other studies find that, in cities with low levels of segregation and growing Asian and/or Hispanic populations, these groups become increasingly segregated as they form their own communities (Fischer et al. 2004; Frey and Farley 1996; Iceland 2004; Logan, Stults, and Farley 2004). Other research also finds an increasing aversion to these groups by natives as immigration continues to rise and as areas become less educated and less white (Saiz and Wachter 2011; Sanchez 1997). Hwang's (2016) study on gentrification during the 1970s and 1980s finds that areas that served as enclave destinations for immigrants were unlikely to gentrify. The processes described thus far can occur directly in specific neighborhoods to which immigrants move, but the influx of immigrants and subsequent changes to the social, economic, or compositional conditions of the neighborhoods across cities, more broadly, may make urban living more or less attractive, regardless of the specific neighborhoods with growing immigrant populations.

Third, the growth of new immigrants increases demand for low-cost housing in central cities. The rise of gentrification results in a new dynamic such that more households are competing for low-cost housing, which may, in turn, affect which neighborhoods gentrify (Waldinger 1989). Immigrants may use informal networks to obtain and rent housing, as they do with jobs (Waters 1999), and their continued influx ensures housing demand in neighborhoods to

which they move. Others have documented the effective political organization of ethnic groups in neighborhoods to prevent development processes and preserve affordable housing (Winnick 1990). At the neighborhood-level, the influx of immigrants may deter gentrification and offset gentrification pressures to other neighborhoods, and, at the city-level, the influx of immigrants may limit the prevalence of neighborhoods that experience gentrification.

The discussion above leads us to the following competing hypotheses:

- *“Pioneering” Hypothesis*: The influx of immigrants to neighborhoods is positively associated with the likelihood of gentrification; more broadly, the influx of immigrants to cities is positively associated with the prevalence of gentrification in cities.
- *“Deterring” Hypothesis*: The influx of immigrants to neighborhoods is negatively associated with the likelihood of gentrification; more broadly, the influx of immigrants to cities is negatively associated with the prevalence of gentrification in cities.

### **Immigration and Gentrification in Minority Neighborhoods**

Immigration may also relate to the shift in gentrification increasingly occurring in minority neighborhoods, specifically black neighborhoods, in the more recent wave of gentrification (e.g., Goetz 2010; Owens 2012; Freeman and Cai 2015; Hyra 2017). The influx of immigrants to cities and neighborhoods may have different effects in neighborhoods depending on their ethnoracial composition. Accounts of gentrifiers' tastes document preferences for ethnoracial diversity and a distaste for the homogeneous, predominantly white suburbs (Zukin 1987; Lloyd 2006; Brown-Saracino 2009), but findings also show that gentrification tends to avoid predominantly black neighborhoods or exhibit limited thresholds for the share of minorities in neighborhoods that they choose, reflecting a limited taste for diversity (Laska and Spain 1980; Smith 1996; Berrey

2005; Bader 2011; Hwang and Sampson 2014). These findings are consistent with research that finds that residential preferences are structured by a racial order, in which people generally prefer integrated neighborhoods, but favor white neighbors the most, black neighbors the least, and Asian over Hispanic neighbors in the middle (Charles 2003). These preferences are strongest among whites but are evident across ethnoracial groups (Charles 2003). Thus, while gentrifiers are primarily white (Freeman 2005; Ellen and O'Regan 2011), these preferences may shape which neighborhoods gentrify in the aggregate regardless of the race or ethnicity of individual gentrifiers.

Thus, black neighborhoods that experience an influx of immigrants may become more attractive for gentrification as these neighborhoods move *up* the ethnoracial hierarchy of residential preferences. A “buffering” process can take place whereby whites, who comprise the majority of gentrifiers, are more willing to live in black neighborhoods that have a substantial presence of Asians and Hispanics by easing black-white racial tensions (Farley and Frey 1994; Logan and Zhang 2010; Hwang 2016; Zhang and Logan 2017). In other neighborhood compositions, however, the influx of immigrants may make neighborhoods less attractive for gentrification as majority non-Hispanic white neighborhoods experience increases in their minority share, thus moving *down* the ethnoracial hierarchy of residential preferences, and other majority-minority neighborhoods (ethnic enclaves and mixed-race majority-minority neighborhoods) become more homogeneous and less diverse (Charles 2003; Hwang and Sampson 2014). On the other hand, if gentrification truly follows preferences for diversity, we would expect a positive effect of the influx of immigrants in both predominantly black and majority-white neighborhoods and a negative effect in other majority-minority neighborhoods. Formally, the hypotheses are as follows:

- *Racial Hierarchy/Buffering Hypothesis*: The influx of immigrants to predominantly black neighborhoods is positively associated with the likelihood of gentrification; the influx of immigrants to non-black neighborhoods is negatively associated with the likelihood of gentrification.
- *Diversity Hypothesis*: The influx of immigrants to predominantly black or white neighborhoods is positively associated with the likelihood of gentrification; the influx of immigrants to non-black minority neighborhoods is negatively associated with the likelihood of gentrification.

Because neighborhoods are interdependent, the influx of immigrants to cities and the associated increased demand for low-cost neighborhoods can offset gentrification pressures onto neighborhoods to which immigrants do not move. These spillover effects are not necessarily spatially proximate but can reverberate in neighborhoods across cities as both immigrants and gentrifiers compete for low-cost housing (Waldinger 1989). In this model of housing competition, in cities with high levels of immigration, neighborhoods with low levels of immigrant influx would be more likely to gentrify than neighborhoods with high levels of immigrant influx. Immigrants may limit gentrification in the urban neighborhoods to which they continue to settle while other neighborhoods offer greater points of entry. If gentrification preferences are indeed governed by a racial or ethnic hierarchy, in high immigration cities, we expect a higher likelihood of gentrification in majority-white neighborhoods with low levels of immigrant influx, followed by other minority neighborhoods and black neighborhoods with low levels of immigration, respectively. This discussion leads to the following hypotheses:

- *Housing Competition Hypothesis*: In cities with high levels of immigrant influx, neighborhoods with low levels of immigration are more likely to gentrify than neighborhoods

with high levels of immigration regardless of ethnoracial composition.

- *Racial Hierarchy and Housing Competition Hypothesis*: In cities with high levels of immigrant influx, among neighborhoods with low levels of immigration, majority-white neighborhoods will be more likely to gentrify compared with other minority and black neighborhoods, while black neighborhoods will be less likely to gentrify compared with other minority and majority-white neighborhoods; neighborhoods with low levels of immigration are more likely to gentrify than neighborhoods with high levels of immigration.

## **Data and Methods**

To test our hypotheses, the analyses draw on data from the 1990 and 2000 decennial US Census and the 2010-2014 (hereafter, 2012) American Community Survey (ACS) 5-year estimates. The analysis includes all metropolitan areas, based on the 2013 US Census metropolitan divisions and statistical areas, with at least one principal city, as defined by the US Census, with the largest principal city having a population of at least 100,000 residents in 2012.<sup>3</sup> There are 151 metropolitan areas that meet these criteria, and they range in size and region, with New York City the largest and Las Cruces, New Mexico the smallest. The boundaries of the metropolitan areas over time are harmonized to the 2013 Census divisions. For each metropolitan area, we examine gentrification from 1990-2012 in its largest principal city, based on populations estimated in the 2012 ACS. In nearly all the metropolitan areas, the largest city is the largest throughout the period of analysis. Although gentrification can occur in principal cities that are

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<sup>3</sup> Metropolitan divisions are groupings of counties within larger metropolitan statistical areas that represent separate labor markets and their adjacent counties with commuting ties. The analysis consists of metropolitan divisions and metropolitan statistical areas where there are no such divisions.

not the largest, the designation of places as principal cities after the largest one changes over time and can meet multiple criteria related to both population and employment. Therefore, we only focus on the largest one for each metropolitan area for consistency over time.

### *Measuring Gentrification*

For this study, we conceptualize gentrification as the process by which previously, low-income central city neighborhoods experience an increase in investment and an in-migration of middle- and upper-class residents. Although scholarly work on gentrification lacks consensus on both the definition and operationalization of gentrification, this study applies a broad definition that is consistent with most research (for a review, see Brown-Saracino [2010]). To identify gentrification, we rely on census tract-level data in each metropolitan area's principal city. Data for all tracts are harmonized to 2010 US Census boundaries obtained from Brown University's Longitudinal Tract Database and the crosswalk file<sup>4</sup> provided, which uses both population and areal weighting. The sample excludes tracts with populations or housing units less than 50 in any Census or ACS year.

Because there is little agreement on how to best identify gentrification, we apply an approach for measuring gentrification that builds from prior approaches and improves reliability in capturing the process described in our definition. We consider a census tract to be gentrifying if it 1) was *gentrifiable*, such that it was previously a lower-income neighborhood that could undergo the socioeconomic transformation that characterizes gentrification, and 2) exhibited socioeconomic upgrading. We present results using one set of criteria, but we also discuss results using a different measure that uses the same approach but employs different thresholds for

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<sup>4</sup> Source: <http://www.s4.brown.edu/us2010/Researcher/Bridging.htm>.

considering a tract gentrifiable and whether it is gentrifying. The online supplementary appendix provides additional details about the measures and compares them to other measures used in past research to justify the use of this approach.<sup>5</sup> In addition, the online supplementary index includes all tables in this article reproduced for the alternative measure. The primary measure presented—the *city-based gentrification measure* (CGM)—categorizes a tract as gentrifiable if the median household income of the census tract in 1990 was below the citywide median household income in 1990; the additional measure referenced throughout the paper—the *metro-based gentrification measure* (MGM)—considers a tract to be gentrifiable if the median household income of the census tract in 1990 was below the metropolitan area median household income. The CGM, therefore, includes tracts that are *relatively* lower-income within each city, while the MGM also includes tracts that may be relatively more socioeconomically advantaged within a poorer city but with wealthier suburbs, like those in the Rustbelt.

Among these gentrifiable tracts, we examine their socioeconomic changes from 1990–2000 and from 2000–2012. We consider a gentrifiable tract to be *gentrifying* if it met two criteria: 1) had a percentage increase above the median citywide (or metropolitanwide for the MGM) percentage increase in the median gross rent or median home value over the period; and 2) had a percentage increase above the median citywide (or metropolitanwide for the MGM) percentage increase in the median household income or an increase in the share of residents 25 and over who are college-educated above the median citywide (or metropolitanwide for the MGM) increase over the period.

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<sup>5</sup> Additional measures were also constructed using identical strategies to those used in previous work, including Bostic and Martin (2003), Freeman (2005), and Ellen and O'Regan (2010), but exploration of these measures suggests these measures are better suited for identifying gentrification in its earlier waves.



The approach includes both the socioeconomic characteristics of the residents in addition to shifts in home prices in the measures to avoid identifying neighborhoods as gentrifying that only experience housing price spillovers without demographic changes (Waldorf 1991). In addition, the measures include changes in *either* median rent or home values because shifts in housing costs in either purchased or rented homes may not occur in step with each other, but either shift reflects changes associated with gentrification. Further, the measures include changes in educational status in addition to median household income because the influx of young professionals or artists often associated with gentrification may not necessarily have high-paying jobs (Ley 1996), and educational status better reflects the influx of new residents rather than incumbent mobility (Freeman 2005).

The measures are consistent with socioeconomic indicators and their changes over the period, shown in Table S1 of the online supplement, which suggests that these measures plausibly identify relatively poor neighborhoods that experience socioeconomic upgrading. Although these binary measures of gentrification overlook important nuances of the gentrification process, such as its pace and stage and visible or cultural characteristics (Zukin 2010; Papachristos et al. 2011; Hwang and Sampson 2014; Brown-Saracino 2017), we rely on these measures to capture the growing prevalence of gentrification over time within central cities to examine general trends across a large number of cities and over a long period of time. For each metropolitan area, we calculated the percentage of gentrifiable tracts that were gentrifying over each period.

To examine differences across neighborhoods based on ethnoracial composition, we classified neighborhoods into three categories based on their composition in 1990: *nonminority*, *black*, and *other-minority*. Neighborhoods over 50% non-Hispanic white are categorized as

*nonminority* neighborhoods. Neighborhoods that are over 70 percent black are categorized as *black*, and all other majority-minority neighborhoods are categorized as *other-minority*.

Seventeen and 58 central cities did not contain other-minority neighborhoods and predominantly black neighborhoods, respectively. Appendix Table A1 presents summary statistics of the ethnoracial compositions of each of these categories of gentrifiable neighborhoods, and Appendix Table A2 lists the central cities with the highest number of gentrifying tracts in each composition category.

Table 1 presents summary statistics for the CGM and MGM. Across the 151 metropolitan areas included in the analysis, an average of 29% of tracts that were gentrifiable in 1990 experienced gentrification during the 1990s and an average of 24% did so over the 2000s according to the CGM, while this share remained steady around 24% based on the MGM. Over the entire period, nearly half of gentrifiable tracts gentrified, indicating that gentrification has been quite prevalent over the last two decades. The prevalence of gentrification between the CGM and MGM across MSAs are highly correlated, having correlations of .81 and .88 during the 1990s and the 2000s, respectively.<sup>6</sup> The distinct downward trend for the CGM between the 1990s and 2000s suggests that the number of metropolitan areas in which central city increases are higher than the metropolitan-wide increases increased over time.

[Table 1 about here.]

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<sup>6</sup> A disproportionately higher share of gentrifiable tracts are gentrifying according to the MGM compared to the CGM during the 1990s in Cambridge, MA, Lafayette, LA, and Seattle, WA and in Minneapolis, MN, St. Louis, MO, and Worcester, MA during the 2000s. In these areas, the metropolitan-wide increases appear to be lower than the city-based median increases, thus allowing more tracts to surpass the threshold for categorization as gentrifying. This occurs where gentrification is widespread within the central city. Birmingham, AL, Madison, WI and Sioux Falls, SD had a disproportionately higher prevalence of CGM rather than MGM during the 1990s, indicating that the metropolitan-wide increases are substantially higher than the central city increases.

Table 1 also includes summary statistics of gentrification for census tracts that were gentrifiable in 1990. About 30% of gentrifiable tracts gentrified during the 1990s and 2000s for both measures, and this percentage increased from the 1990s to the 2000s, though this change was smaller based on the CGM. Tracts were also more likely to gentrify during the 2000s if they were gentrifying during the 1990s (not shown in table). Figure 1 illustrates the metropolitan areas included in the dataset shaded by their prevalence of gentrification in each decade based on the CGM. During the 1990s, cities experiencing high levels of gentrification during the 1990s were generally located in the Northwest and Midwest, whereas cities experiencing high levels of gentrification during the 2000s were concentrated in Coastal areas.

[Figure 1 about here.]

Nonminority tracts comprise over 40% of gentrifiable tracts and the majority of gentrifying tracts. During the 1990s, most of the tracts that gentrified were nonminority tracts (44.7%), and most were other-minority tracts during the 2000s (40%). Figure 2 illustrates the proportions of gentrifiable tracts in each composition category for each measure and the share of those tracts that are gentrifying. Among predominantly black neighborhoods, which comprise the fewest gentrifiable tracts—just over 20%—the highest share of these tracts gentrified during the 1990s but this share declined slightly during the 2000s for both measures. All other-minority tracts comprise about one-third of gentrifiable tracts. Only 23% gentrified during the 1990s, but this increased to over one-third during the 2000s and comprise the majority of gentrifying tracts during the period. Of all gentrifying tracts, black tracts comprise the lower share (26% and 22% during the 1990s and 2000s, respectively), but among black tracts, the higher share gentrified over the analysis period compared to other ethnoracial categories (54% compared to 51% and

50% for nonminority and other-minority tracts).<sup>7</sup>

[Figure 2 about here.]

### *Modeling Strategy*

Given the various hypothesized pathways for which immigration may be associated with gentrification, we separately model variation in the prevalence of gentrification across cities and in the likelihood a census tract will gentrify. The first set of models use metropolitan areas as the unit of analysis, and the second set of models use tracts as the unit of analysis. For metropolitan area-level models, we constructed a stacked dataset with metropolitan area-period observations, with each period denoting the two periods of gentrification observed, 1990-2000 and 2000-2012. We use a linear model to predict the prevalence of gentrification in a metropolitan area. Tract-level models similarly rely on a stacked dataset for each tract-period observation. The structure of the data also accounts for the fact that tracts are nested within metropolitan areas. The dependent variable in tract-level models is whether a tract is gentrifying or not, and we use logistic regression models.

All models include period fixed effects with the 2000s as the reference period and therefore include a dummy indicator for observations related to gentrification during the 1990-2000 period. Period fixed effects account for unobserved characteristics related to national time trends that may affect the relationship between gentrification and immigration. Tract-level

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<sup>7</sup> We do not observe an increased prevalence during the 2000s among black tracts. Freeman and Cai (2015) find that an increased share of black neighborhoods experience an influx of whites from 2000-2010 relative to prior decades that is explained by gentrification. This is distinct from the measures in this study, which aim to capture the influx of high-SES residents, without distinguishing their race. Indeed, other studies suggest that middle-class blacks often pioneer gentrification in black neighborhoods, later attracting whites, which can explain the persistence across both decades (Bostic and Martin 2003; Pattillo 2007; Timberlake and Johns-Wolfe 2016).

models also include metropolitan fixed effects, which account for unobserved time-invariant differences across metropolitan areas that may affect the relationship between immigration and gentrification, such as state or local laws and cultural attitudes.<sup>8</sup> For this analysis, the fixed effects framework, as opposed to a multilevel regression framework, provides the advantage of comparing differences among tracts within the same metropolitan contexts given that metropolitan contexts have distinct and unobserved characteristics that shape the likelihood that a neighborhood will gentrify.

Because the influx of immigrants may be operating at various levels of geography to affect gentrification, tract-level models consider both immigration within a neighborhood and immigration to the city more broadly. The models use the share of residents who are foreign-born and entered the US over the period of gentrification. For example, for gentrification occurring over 1990-2000, the corresponding immigration variable is the share of residents who immigrated from 1990-2000. Thus, the analysis examines simultaneous trends in immigration and gentrification and does not attempt to assess causality. Separate analyses examine the share of residents who immigrated in the previous decade, the share of foreign-born residents at the beginning of the decade, and the share of recent immigrants migrating only to the metropolitan area, and notable results are discussed below.

Models also include interaction terms between the time dummy variable and the immigration variables to test if the relationship varies across periods. Immigrants arriving during

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<sup>8</sup> Metropolitan-area fixed effects are not included in the metropolitan area-level models because this would limit the analysis to depend on differences between two observations within each metropolitan area. Although this approach leaves potential for omitted variable bias, the goal of the analysis is to document a descriptive understanding of the relationship between immigration and gentrification at the metropolitan-level and then to use the tract-level models to better understand the mechanisms of the relationship.

the 2000s moved to a context in which gentrification had begun to spread and intensify, whereas immigrants arriving during the 1990s moved to a context in which gentrification may have been nascent in many cities. Further, there are selective differences in the characteristics of immigrants arriving during the 1990s and 2000s resulting from global trends and policy reforms, which may affect gentrification differently across decades. Given the various issues with interpreting effects and interaction terms for nonlinear models (Ai and Norton 2003; Mood 2010), we also ran all analyses as linear probability models to verify our interpretations of interaction terms and we present marginal effects in addition to odds ratios. For all interactions examined in logistic regression results, the substantive conclusions are similar in linear probability models and are available upon request.

[Table 2 about here.]

Table 2 presents descriptive statistics of the independent variables for both metropolitan areas and gentrifiable tracts included in the analysis. Control variables are based on previous research on key indicators predicting gentrification. Variables that may be associated with the prevalence of gentrification in a city include the population (logged), the share of non-Hispanic blacks, the share of residents living below poverty, the homeownership rate, and the vacancy rate in the central city. The models also include variables for the share of employed civilians working in the manufacturing industry and those working in professional or managerial occupations in the metropolitan area to capture features of the labor market that may attract more gentrification to a city. Tract-level models use similar control variables for census tracts: logged population, the share of non-Hispanic blacks, the share of residents living below poverty, the homeownership rate, and the vacancy rate. In addition, models include median home value and median rents in the census tract to account for the baseline value of the neighborhood. All metropolitan-level

controls are also included in the tract-level models.

To adjudicate between the racial hierarchy/buffering and diversity hypotheses, we conduct separate tract-level analyses for nonminority tracts, other-minority tracts, and black tracts. Finally, to test the housing competition hypotheses, we assess tract-level models for each period with interaction terms between neighborhood racial composition categories and the share of recent immigrants to neighborhoods and cities.

## **Results**

### *Immigration and Gentrification: Pioneering or Deterring in Cities?*

We first examine whether the influx of immigrants is associated with pioneering or deterring gentrification at the city-level by examining the relationship between city immigration levels and the prevalence of gentrification across cities. Our findings suggest that immigrant influx deters gentrification during the 1990s but is associated with pioneering during the 2000s. Results in Table 3 are from metropolitan area-level regression models with period fixed-effects predicting the percentage of gentrifiable tracts that gentrify based on the CGM on the share of central city residents who are recent immigrants. Model 1 examines the bivariate relationship between recent immigration and gentrification and contains no control variables. Model 2 includes an interaction term between the 1990s-decade dummy indicator and the immigration variable to test if the effect is different over time. Model 3 includes control variables.

[Table 3 about here.]

Model 1 indicates that the relationship between the prevalence of gentrification and recent immigration is not statistically distinguishable from zero. Instead, the coefficient for the dummy indicator for the 1990s decade is positive, indicating that there is more gentrification in

the 1990s relative to the 2000s based on this measure.<sup>9</sup> When the interaction term between immigration and period is included in Model 2, results for both gentrification measures show that the share of recent immigrants has a strong positive and statistically significant relationship with gentrification during the 2000s. The negative and statistically significant interaction term indicates that the share of recent immigrants is not positively correlated with gentrification during the 1990s. When time-varying control variables are included in Model 3, the coefficients for recent immigration decrease, but the coefficient remains positive and statistically significant. A one-percentage point increase in the percent of recent immigrants is associated with a 0.85 percentage point increase in the percent of gentrifiable tracts that gentrify. The interaction term between the share of recent immigrants and the 1990s dummy variable remains negative and statistically significant, while the dummy indicator for the 1990s decade remains positive and statistically significant. The other factor predicting the prevalence of gentrification is shares of residents in professional and managerial positions ( $p < .05$ -level). In models predicting the prevalence of the MGM, evidence of pioneering during the 2000s is weaker, while a deterring effect during the 1990s remains strong.

Findings from models using the share of recent immigrants in the broader metropolitan area show similar substantive results with stronger effects. Additional models using the share of foreign-born residents or the share of recent immigrants from the prior decade to which gentrification is measured indicate that the relationship between gentrification and immigration is not statistically distinguishable from zero, and the interaction term between the 1990s decade and immigration from the prior decade is negative. Thus, the positive relationship between

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<sup>9</sup> For the MGM, however, the relationship between recent immigrants and gentrification is positive and statistically significant and the time dummy is not significant.



immigration and gentrification during the 2000s observed in Table 3 applies only to the influx of immigrants over the same period in which gentrification is measured.

Metropolitan areas in our sample with high immigration levels had similar ethnoracial compositions in 1990 in areas with both high and low levels of gentrification; however, areas with high levels of Hispanic growth during the 1990s had a low prevalence of gentrification in the 2000s, and areas with relatively higher shares of Asians and blacks in 2000 were associated with a higher prevalence of gentrification during the 2000s. Among metropolitan areas with high immigration levels but low shares of gentrifying neighborhoods, the share of Hispanics increased by 79.0% while the share of Asians and blacks decreased, but in areas with high immigration levels and high shares of gentrifying neighborhoods, the average share of Asians increased from 4.0% to 7.1% and from 7.9% to 11.9% for blacks. This pattern suggests that the relationship between immigration and gentrification varies by ethnoracial groups comprising immigration. Although publicly available data are not available for race/ethnicity by nativity for the analysis period of this study, recent data indicate that most foreign-born residents in cities with high levels of gentrification are not black, but these data do not provide information on whether these immigrants are recent.<sup>10</sup>

In sum, these findings support a process in which gentrification is occurring in more neighborhoods over time in central cities where newly arriving immigrants are also moving during the 2000s, supporting the pioneering hypothesis. During the 1990s, other actors and institutions drive the initial spread of gentrification as it began to take off while the influx of immigrants appears to deter gentrification.

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<sup>10</sup> Authors' calculations based on 1990 and 2000 Decennial US Censuses and 2010-2014 ACS 5-year estimates.

*Immigration and Gentrification: Pioneering or Deterring in Tracts?*

Next, we adjudicate between whether these processes are occurring at the neighborhood level or through a broader-reaching process across cities by examining how the influx of immigrants to census tracts is associated with the likelihood of gentrification. Among gentrifiable tracts in the sample, recent immigrants during the analysis period tended to move to areas that had relatively high preexisting shares of foreign-born, Hispanic, and Asian populations. Notably, tracts with the lowest shares of recent immigrants (by quartiles) tend to have the highest average shares of blacks, especially in large metropolitan areas and areas with high historical levels of black-white segregation levels, based on the dissimilarity index. Among tracts with high immigration levels in cities with high shares of gentrifying tracts during the 2000s, the shares of blacks and Asians were larger, and, compared to high-immigrant tracts in cities with low shares of gentrifying tracts, the shares of non-Hispanic whites and Hispanics were relatively smaller. In 1990s, however, the share of non-Hispanic whites was much higher – 65.82% compared with 44.81% – in high-immigrant tracts in cities with high levels of gentrification relative to tracts in cities with low levels of gentrification.<sup>11</sup>

From our logistic regression results, we find that immigrant influx deters gentrification at the tract-level. Table 4 presents odds ratios and standard errors from tract-level logistic regression models with metropolitan area and time fixed-effects predicting the odds of CGM. An odds ratio greater than one indicates a positive relationship between the likelihood of gentrification and the variable, and an odds ratio less than one indicates a negative relationship. Model 1 examines the bivariate relationship between the share of recent immigrants to a tract

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<sup>11</sup> Authors' calculations based on 1990 and 2000 Decennial US Censuses.

and its likelihood of gentrifying over the same period. Model 2 includes an interaction term between the 1990s-decade dummy indicator and the immigration variable to test if there are differences in the effects across decades. Model 3 includes tract-level time-varying control variables. Model 4 includes metropolitan-level time-varying control variables, including an interaction term between the share of recent immigrants to the city and the dummy variable for the 1990s decade, to test whether tracts are more likely to gentrify because of immigrant influx directly to tracts or because of their broader influx to the principal city.

[Table 4 about here.]

Model 1 results show that the share of recent immigrants in a tract is negatively associated with the odds that a census tract will gentrify. A one-percentage point increase in the share of recent immigrants to a tract decreases the odds of gentrification by 3 percent. Model 2 results show that the negative relationship between immigration and gentrification is even more negative in the 1990s compared to the 2000s. The negative relationship for immigrants remain similar in models including tract-level control variables shown in Model 3 and are similar for both gentrification measures.

Tracts with lower populations, lower shares of non-Hispanic blacks, higher poverty rates, lower homeownership rates, higher vacancy rates, and higher median home values and rents are also associated with greater odds of gentrification. These results are consistent with past research on factors predicting gentrification within neighborhoods. Lower populations, low homeownership, and more vacancies provide points of entry into neighborhoods for the influx of higher-SES residents, while neighborhoods with relatively lower shares of blacks are more likely to gentrify (Laska and Spain 1980; Smith 1996; Hwang and Sampson 2014). The small but positive association of median home values and rents suggest that tracts more likely to gentrify

begin the period with a slightly higher exchange value than those that do not gentrify; however, higher poverty rates are also associated with greater odds of gentrifying.

In Model 4, the negative association of tract-level immigration on the odds of gentrification remains, but the interaction effect between tract-level immigration and period becomes positive. While the interaction term is not statistically significant, linear probability models indicate that the negative effect of tract-level immigration is slightly weaker during the 1990s than in the 2000s. Although the influx of immigrants to neighborhoods directly is negatively associated with gentrification in those neighborhoods once we control for time-varying metropolitan-level factors, the influx of immigrants to cities increases the odds of gentrification among neighborhoods. Like the results presented earlier in the metropolitan-level models, the interaction term with the 1990s dummy indicator is negative, indicating that this positive effect only occurs during the 2000s. A one-percentage point increase of the share of recent immigrants to a city increases the odds of gentrification in a tract by 30 percent. Results using the MGM, share of recent immigrants to the metropolitan area rather than the central city, share of recent immigrants from the prior decade, and the share of foreign-born residents produce similar results. Thus, places in which immigrants already existed, which are the very places in which immigrants are more likely to move, were unlikely to gentrify.

Overall, the findings for the metropolitan-level variables are consistent with the metropolitan-level findings presented in Table 3, but the tract-level results reveal that it is not the influx of immigrants directly to neighborhoods that is driving more gentrification in cities. Instead, the gentrifiable neighborhoods to which new immigrants do *not* move are more likely to gentrify. Thus, the results support the deterring hypothesis rather than the pioneering hypothesis at the tract level across both decades. The findings instead point to a broader process in which

both gentrification and immigrant influx are occurring in the same cities during the 2000s while gentrifiers and recent immigrants are moving to different places within these cities.

*Minority Gentrification: Racial Hierarchy/Buffering or Diversity?*

Next, we examine whether the influx of immigrants associated with the likelihood of gentrification in neighborhoods varies by the ethnoracial composition of neighborhoods to test if processes of buffering and a racial hierarchy are at work or one that reflects preferences for diversity. Results shown in Table 5 support a buffering process reflecting a racial hierarchy rather than preferences for diversity. Table 5 presents results from tract-level logistic regression models for tracts separated by their ethnoracial composition category in 1990—nonminority (over 50% non-Hispanic white), black (over 70% black), and other-minority (less than 50% non-Hispanic white but not over 70% black). In these neighborhoods, the average share of recent immigrants to other-minority tracts was more than three times higher during the 1990s and more than double during the 2000s compared with the shares in either black and nonminority tracts, and the shares were slightly lower in black tracts compared to nonminority tracts in both periods. The set of models shown are identical to Models 3 and 4, respectively, in Table 4. The results are similar for the MGM and are reported in the Supplemental tables.

[Table 5 about here.]

The results reveal substantive differences between predominantly black tracts relative to nonminority and other-minority tracts. Whereas the share of recent immigrants is negatively associated with gentrification in nonminority and other-minority tracts, the relationship is positive in black tracts. A one-percentage point increase in the share of recent immigrants in a tract is associated with an increase in the odds of gentrifying by 9 percent in a black tract but a 5

percent and 4 percent decrease in the odds of gentrifying in nonminority or other-minority tracts, respectively. The period dummy indicator and interaction variable also exhibit differences by racial composition category. The interaction term and relevant coefficients in the first set of models indicate that the positive effect of immigrants in black tracts on average was actually larger in the 1990s, while the negative effect of immigrants in minority and other minority tracts was stronger during the 1990s.

The second set of models in Table 5 add the city-level share of recent immigrants, metropolitan-level control variables, and an interaction term with the period dummy indicator and the city-level share of recent immigrants. Similar differences persist across neighborhood compositions for the tract-level share of recent immigrants. Although the direction of the interaction terms with tract-level immigration and the 1990s dummy indicator switch directions, the overall relationships are the same as in the first set of models, except the effect of immigrant influx in black tracts is weaker in the 1990s. Figure 3 depicts the predicted probabilities of gentrification from these models across tracts as the share of recent immigrants increases by their composition category for each decade for tracts and metropolitan areas with average levels of other characteristics, illustrating the differential effects of tract-level immigration across neighborhood compositions.

The city immigration levels, however, have a similar effect across all neighborhood composition categories. The share of recent immigrants to a city increases the odds of neighborhood gentrification during the 2000s, but this positive effect only applies to the 2000s. While the statistical significance of the other control variables varies across the racial composition categories, the direction and strength of the relationships between gentrification and the other variables are quite similar across models.

[Figure 3 about here.]

Overall, these results are consistent with both a buffering process, in which the influx of immigrants make predominantly black neighborhoods more attractive to gentrifiers, especially during the 2000s, and a racial hierarchy such that the influx of immigrants to other-minority and white neighborhoods deters gentrification across both decades. In contrast to claims that gentrifiers are attracted to ethnoracial diversity, the results show that the influx of immigrants to neighborhoods with high shares of whites reduces the likelihood of gentrification in a neighborhood, suggesting limited preferences for diversity. At the same time, the results suggest that new immigrants to cities more broadly are associated with pioneering across all neighborhood compositions in cities during the 2000s.

### *Housing Competition?*

The last part of the analysis tests the final hypotheses about housing competition. We hypothesized that in cities with high levels of immigrant influx, neighborhoods with low levels of immigration are more likely to gentrify than neighborhoods with high levels of immigration regardless of ethnoracial composition. However, if a racial hierarchy is at work in these places, we expect to see differences across these neighborhoods depending on ethnoracial composition. Our findings support the racial hierarchy and housing competition hypothesis during the 1990s, but suggest two processes are occurring during the 2000s: 1) housing competition such that the influx of immigrants to neighborhoods offsets gentrification pressures to other neighborhoods to which they do not move; and 2) direct pioneering in black tracts. As a result, gentrification is more prevalent in black tracts once we control for other characteristics that predict gentrification. The models used to test our hypotheses predict the likelihood of gentrification for a tract for each

period modelled separately and include tracts of all racial compositions together. The first model does not include any interactions terms and allows a comparison of each composition category controlling for the share of immigrants at the tract- and city-level. The second model includes an interaction term between tract ethnoracial composition category and the share of recent immigrants to the tract, and the third model includes an interaction term between tract ethnoracial composition category and the share of recent immigrants to the city. The interaction terms in the models allow us to test if there are heterogeneous effects of immigration at the tract- and city-level across ethnoracial composition categories. The final model includes interaction terms for both the share of immigrants to the tract and the share of immigrants to the city to examine the effect of these two processes simultaneously on different ethnoracial composition categories. All models include tract- and metropolitan-level controls. Table 6 presents these results, and results are similar for the MGM.

[Table 6 about here.]

The results in Model 1 show that the other-minority tracts were less likely to gentrify than nonminority tracts during the 1990s and the odds ratio of gentrification for black tracts was not statistically distinguishable from nonminority tracts. During the 2000s, however, both black tracts and other-minority tracts had significantly higher odds of gentrifying than nonminority tracts. Across both decades, the share of recent immigrants to a tract is negatively associated with gentrification while the share of recent immigrants to a city is positively associated with it. The difference during the 1990s from results presented earlier is likely because we do not control for other unobserved differences between metropolitan areas in these models, which may explain differences in gentrification during this period. The results in Model 2 show that there were no substantial differences based on the influx of recent immigrants to nonminority and other-



minority tracts, but the odds of gentrification for black tracts increase substantially on average with the influx of immigrants, consistent with the results presented earlier. Model 3 results show that, while tract-level shares of immigrants were associated with lower odds of gentrification, the city-level share of recent immigrants increased the odds of a tract gentrifying across both decades for nonminority tracts. The odds of black tracts gentrifying decreased in cities with higher shares of recent immigrants during the 1990s, but this trend flipped during the 2000s. In other-minority tracts across both decades, the share of recent immigrants to cities are associated with lower odds that these neighborhoods gentrify.

The results from the fourth set of models show that, once we take into account the tract-level effect of immigrant influx, city-level immigration no longer has an increased effect on black tracts during the 2000s. Instead, the influx of recent immigrants to black neighborhoods directly contributes to the increased odds of gentrification during the 2000s. Nonetheless, greater levels of recent immigration to cities is associated with decreased odds of gentrification in other-minority tracts and increased odds of gentrification in nonminority neighborhoods across both decades.

Figure 4 plots predicted probabilities for ethnoracial composition categories of neighborhoods based on the final full model for various combinations of the share of recent immigrants in tracts and in cities to illustrate these comparisons. Low and high levels of immigration are fixed at the 25<sup>th</sup> and 75<sup>th</sup> percentiles of each respective variable, and all other control variables are held at their means. During the 1990s, in cities with high levels of immigration, only nonminority tracts with low levels of recent immigration had very high probabilities of gentrifying, while other-minority tracts had substantially lower probabilities of gentrifying. These results support our hypothesis that both processes of a racial hierarchy and

housing competition are at work shaping how gentrification unfolds during the 1990s. Notably, in cities with low levels of immigration, black tracts with both low and high levels of immigrants had higher probabilities of gentrifying compared to other tracts with higher levels of immigration. These patterns shifted during the 2000s, however. In cities with high levels of immigration, black tracts had high probabilities of gentrifying, and this was far more likely in black tracts with immigrants compared to other tracts with high levels of recent immigrants but was comparable across neighborhoods with low levels of recent immigrants. Further, in tracts with low levels of immigration, the probability of gentrification was significantly higher in cities with high levels of immigration, suggesting that a housing competition process was occurring that did not reflect a racial hierarchy during the 2000s. Overall, the findings suggest that the dynamics of housing competition for low-cost neighborhoods shifted from the 1990s to the 2000s.

[Figure 4 about here.]

## **Discussion and Conclusion**

Since the 1990s, half of low-income central city neighborhoods across the 151 US cities analyzed in this study have experienced gentrification. This percentage is even higher among neighborhoods that were predominantly black in 1990. The prevalence of such changes contradicts theories of urban neighborhood change describing decline and neighborhood racial transitions from white to black, as well as the persistence of neighborhood stratification by race and class (Park, Burgess, and McKenzie 1925; Duncan and Duncan 1957; Hoover and Vernon 1959; Sampson 2012). These trends were prevalent for most of the twentieth century, but alternative trajectories of neighborhoods are now prevalent. This study offers new insights into

the changing context of neighborhoods and cities in the twenty-first century. Building on insights from prior research on neighborhood change, immigration, and residential stratification, this article tests several hypotheses about the relationship between gentrification and immigration at both the metropolitan- and neighborhood-levels. The findings underscore several important features of urban change in cities today.

First, the findings show significant differences between the dynamics occurring in the 1990s and 2000s, reflecting the rapidly changing dynamics of immigration and gentrification. Whereas the metropolitan areas to which immigrants tended to migrate during the 1990s had a negative relationship with the prevalence of gentrification, there is a strong positive relationship during the 2000s. This is likely explained by the shifting patterns of immigrant settlement to different metropolitan areas and to different areas within them and by shifting profiles of immigrants. Second, the distinct relationships between immigration and gentrification at the neighborhood-level relative to the metropolitan-level are noteworthy and suggest that there are distinct sorting processes between gentrifiers and immigrants. For both decades, the influx of immigrants to a neighborhood is negatively associated with the neighborhood's odds of gentrifying on average, but the influx of immigrants to the city or metropolitan area is positively associated with the odds of neighborhood gentrification during the 2000s.

Third, the recent wave of gentrification continues to follow processes reflecting an ethnoracial hierarchy. The influx of immigrants into predominantly black neighborhoods significantly increases their likelihood of gentrification across both decades, while it significantly decreases the likelihood of gentrification in other-minority and nonminority neighborhoods. These findings are consistent with a process of buffering in which gentrifiers are more willing to live in black neighborhoods if there is a substantial influx of immigrant residents, and they also

demonstrate limited preferences for diversity by gentrifiers. The influx of immigrants to predominantly white neighborhoods is negatively associated with gentrification as they become more diverse, and the influx of immigrants to other-minority neighborhoods is also negatively associated with gentrification across both decades as they become more homogeneous.

Fourth, the results show that the lack of an influx of immigration to neighborhoods is positively associated with gentrification in high-immigration cities. This suggests that, as gentrifiers and recent immigrants compete for affordable housing, they differentially sort into distinct neighborhoods. This process is racially patterned during the 1990s but not the 2000s. During the 1990s, nonminority neighborhoods with low levels of immigration in cities with high levels of immigration were much more likely to gentrify than all other neighborhoods; and, in the 2000s, this pattern occurred for all gentrifiable neighborhoods, as the market for urban housing tightened. For predominantly black neighborhoods, the combination of this process and the positive effect of immigrant influx on black neighborhoods explains their greater likelihood of gentrification compared with other neighborhood compositions during the 2000s after accounting for other neighborhood- and metropolitan-level characteristics. The increased demand for low-cost housing imposed by both rising numbers of recent immigrants and the spread of gentrification creates a new dynamic shaping patterns of uneven development within cities.

It is noteworthy that the gentrification-immigration relationship is negative in supplementary models that examine the influx of recent immigrants from the prior decade. Thus, the influx of immigrants does not *lead* to more gentrification in the subsequent period but, instead, indicates that gentrification is growing in places where immigration is also growing. Because the Census data only observes places every ten years and American Community Survey 5-year estimates only provide an estimate of neighborhoods over a 5-year period, we cannot

distinguish at the neighborhood-level the dynamics of demographic change at a fine-grained time-scale. Thus, it is possible that immigrants are attracted to cities where gentrification is prevalent but choose to move to low-cost neighborhoods that are not gentrifying and to black neighborhoods that are also gentrifying but relatively cheaper than other gentrifying neighborhoods.

The findings from this study are descriptive and shed light on the relationship between immigration and gentrification in recent decades. Future research should further explore the mechanisms associated with these relationships. Does the influx of recent immigrants improve social and economic conditions of cities that then lead to more gentrification in cities though neighborhood selection remains racially selective? Do gentrifiers avoid immigrants more than black neighborhoods today? What is the role of landlords and property owners in shaping selection patterns among new immigrants and gentrifiers? Because these data are decadal, incremental changes at the neighborhood-level are not possible to detect, but the increased availability of new forms of data that are available at finer temporal resolution may be able to change these possibilities. Further, understanding what types of places new immigrants are moving and their search process and decisions in the housing market can also shed light on the findings highlighted in this research.

This study reveals that new dynamics of residential sorting underlie urban change in the twenty-first century while old mechanisms persist. As immigration flows continue, cities become increasingly multiethnic, and gentrification continues to spread across cities, the patterns we find during the 2000s provide insights into the future of US cities and neighborhood hierarchies. As gentrification has evoked considerable debate surrounding its implications for racial, ethnic, and socioeconomic inequality, understanding the nature of uneven development and its changing

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dynamics are important for developing interventions to mitigate its impacts. Altogether, this study highlights new dynamics shaping urban transformations and underscores the importance of considering both gentrification and immigration together and the changing dynamics of the housing market.

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**Tables**

Table 1. Descriptive Statistics of the Prevalence of Gentrification in MSAs and across Tracts

		<u>City-based gentrification measure</u>				N	<u>MSA-based gentrification measure</u>				N
		Mean	Std. Dev.	Min.	Max.		Mean	Std. Dev.	Min.	Max.	
Metropolitan Areas											
	1990s	29.13	17.92	0.00	68.97	151	23.94	17.47	0.00	83.33	151
	2000s	24.23	14.17	0.00	68.75	151	25.50	18.32	0.00	100.00	151
	1990-2012	48.62	16.66	0.00	83.33	151	43.76	19.72	0.00	100.00	151
Tracts											
All tracts											
	1990s	0.29	0.45	0.00	1.00	7,951	0.27	0.44	0.00	1.00	9,370
	2000s	0.30	0.46	0.00	1.00	7,951	0.31	0.46	0.00	1.00	9,370
	1990-2012	0.51	0.50	0.00	1.00	7,951	0.49	0.50	0.00	1.00	9,370
Nonminority neighborhoods (in 1990)											
	1990s	0.30	0.46	0.00	1.00	3,333	0.27	0.44	0.00	1.00	4,297
	2000s	0.27	0.44	0.00	1.00	3,333	0.29	0.45	0.00	1.00	4,297
	1990-2012	0.51	0.50	0.00	1.00	3,333	0.48	0.50	0.00	1.00	4,297
Other minority neighborhoods (in 1990)											
	1990s	0.23	0.42	0.00	1.00	2,845	0.23	0.42	0.00	1.00	3,052
	2000s	0.33	0.47	0.00	1.00	2,845	0.35	0.48	0.00	1.00	3,052
	1990-2012	0.50	0.50	0.00	1.00	2,845	0.49	0.50	0.00	1.00	3,052
Black neighborhoods (in 1990)											
	1990s	0.33	0.47	0.00	1.00	1,773	0.31	0.46	0.00	1.00	2,021
	2000s	0.29	0.46	0.00	1.00	1,773	0.29	0.46	0.00	1.00	2,021
	1990-2012	0.54	0.50	0.00	1.00	1,773	0.52	0.50	0.00	1.00	2,021

Table 2. Descriptives Statistics for Analysis Variables

	1990				2000			
	Mean	Std. Dev.	Min.	Max.	Mean	Std. Dev.	Min.	Max.
MSA-level variables (N = 151)								
% immigrants arriving in last 10 years (city)	3.9	4.0	0.2	21.6	5.4	4.0	0.3	16.2
% immigrants arriving in last 10 years (MSA)	2.8	3.1	0.2	17.2	4.0	3.1	0.3	15.5
% foreign-born (city)	8.1	7.6	0.9	38.4	11.5	9.1	1.1	40.9
% foreign-born (MSA)	6.6	6.6	0.8	32.7	9.4	8.0	1.4	36.2
City population (logged)	12.2	0.9	10.7	15.8	12.4	0.9	11.1	15.9
% non-Hispanic white (city)	64.4	19.6	5.6	96.6	55.8	20.1	5.0	93.4
% non-Hispanic black (city)	19.7	17.6	0.0	75.3	21.1	18.9	0.2	81.2
% Hispanic (city)	12.0	16.8	0.4	93.9	16.4	18.4	0.8	94.1
% Asian (city)	3.1	4.2	0.3	28.4	3.9	4.8	0.4	31.1
% below poverty (city)	17.9	6.3	5.9	43.9	17.4	5.7	6.5	36.0
% homeownership (city)	52.0	8.8	23.1	75.1	53.6	9.3	23.8	80.0
% vacant units (city)	8.5	3.2	3.1	18.2	7.5	2.9	1.9	16.6
% manufacturing industry (MSA)	15.9	6.1	3.7	34.0	12.9	5.3	2.1	27.9
% professional/managerial occupations (MSA)	26.8	3.8	19.5	38.2	33.9	5.1	23.8	50.2
Tract-level variables for city-based measure (N = 7,951)								
% immigrants arriving in last 10 years	8.2	10.7	0.0	64.2	9.7	9.8	0.0	57.3
% foreign-born	14.9	16.9	0.0	82.3	19.5	18.3	0.0	82.8
% non-Hispanic white	40.6	33.2	0.0	99.4	32.5	29.4	0.0	98.1
% non-Hispanic black	32.9	35.3	0.0	99.9	34.0	34.6	0.0	99.7
% Hispanic	21.3	26.2	0.0	98.8	26.4	28.1	0.0	98.9
% Asian	4.2	8.3	0.0	93.8	5.4	9.7	0.0	90.9
% below poverty	28.4	15.0	1.7	93.9	27.6	13.1	0.0	88.2
% homeownership	36.1	21.4	0.0	96.1	36.6	21.3	0.0	98.5
% vacant units	10.5	6.9	0.0	83.6	9.4	6.4	0.0	58.8
Median home value	172,790	147,086	8,794	1,820,757	166,677	135,244	7,084	1,420,001
Median rent	649	227	191	1,932	669	231	141	2,841

Notes: Dollar values are adjusted to 2014 dollars. Tract statistics only include gentrifiable tracts in 1990.

Table 3. Results for MSA-level Models Predicting Prevalence of City-Based Gentrification on City-level Share of Recent Immigrants

	(1)	(2)	(3)
	No	Time *	
	controls	Immigra-	Controls
		tion	
Intercept	23.20 (2.04) ***	16.33 (2.60) ***	-36.24 (20.99) +
% recent immigrants (city)	0.16 (0.25)	1.25 (0.36) ***	0.85 (0.43) *
1990s (Ref: 2000s)	5.05 (1.87) **	16.77 (3.39) ***	20.67 (3.72) ***
% recent immigrants * 1990s		-1.98 (0.48) ***	-1.76 (0.48) ***
City population (logged)			2.08 (1.14) +
% non-Hispanic black (city)			0.08 (0.07)
% below poverty (city)			0.37 (0.19) +
% homeownership (city)			0.14 (0.15)
% vacant units (city)			-0.60 (0.37)
% manufacturing industry (MSA)			-0.11 (0.16)
% professional/managerial occupations (MSA)			0.58 (0.25) *

Notes: N = 151. \*\*\*p<.001; \*\*p<.01, \*p<.05, +p<.10.

Table 4. Results for Tract-level Models Predicting City-Based Gentrification on Share of Recent Immigrants (Odds Ratios)

	(1)	(2)	(3)	(4)
	No	Immigra-	Tract-	City-level
	controls,	tion	level	immigrati
	MSA FE	(Tract)	Controls	on
% recent immigrants (tract)	0.97 (0.00) ***	0.98 (0.00) ***	0.97 (0.00) ***	0.95 (0.00) ***
1990s (Ref: 2000s)	0.96 (0.04)	1.21 (0.05) ***	0.99 (0.06)	0.67 (0.23) +
% recent immigrants * 1990s		0.97 (0.00) ***	0.96 (0.00) ***	1.01 (0.01)
population (logged)			0.52 (0.04) ***	0.50 (0.04) ***
% non-Hispanic black			0.99 (0.00) ***	0.99 (0.00) ***
% below poverty			1.02 (0.00) ***	1.01 (0.00) ***
% homeownership			1.00 (0.00) ***	0.99 (0.00) ***
% vacant units			1.04 (0.00) ***	1.04 (0.00) ***
median home value			1.00 (0.00) ***	1.00 (0.00) ***
median rent			1.00 (0.00) ***	1.00 (0.00) ***
% recent immigrants (city)				1.31 (0.04) ***
% recent immigrants * 1990s				0.89 (0.02) ***
N (tract-years)	15,902			

Notes: \*\*\*p<.001; \*\*p<.01, \*p<.05, +p<.10. Model 4 also includes additional metropolitan-level controls from previous models.

Table 5. Results for Tract-level Models Predicting City-based Gentrification on Share of Recent Immigrants by Neighborhood Race (Odds Ratios)

	(1)			(2)		
	Time * Immigration (Tract)			Time * City-level Immigration		
	(a)	(b)	(c)	(a)	(b)	(c)
	Nonminority	Other minority	Black	Nonminority	Other minority	Black
% recent immigrants (tract)	0.95 (0.01) ***	0.96 (0.01) ***	1.09 (0.01) ***	0.93 (0.01) ***	0.94 (0.01) ***	1.04 (0.02) **
1990s (Ref: 2000s)	0.82 (0.10) +	0.57 (0.13) ***	1.45 (0.12) **	0.92 (0.32)	0.21 (0.46) ***	4.21 (0.86) +
% recent immigrants (tract) * 1990s	0.99 (0.01)	0.99 (0.01)	0.87 (0.02) ***	1.03 (0.01) **	1.01 (0.01)	0.96 (0.02)
population (logged)	0.56 (0.07) ***	0.49 (0.07) ***	0.49 (0.10) ***	0.56 (0.07) ***	0.47 (0.07) ***	0.45 (0.11) ***
% non-Hispanic black	0.98 (0.00) ***	0.98 (0.00) ***	0.98 (0.01) ***	0.98 (0.00) ***	0.98 (0.00) ***	0.98 (0.01) ***
% below poverty	1.01 (0.00) **	1.02 (0.00) ***	1.03 (0.01) ***	1.00 (0.00)	1.02 (0.00) ***	1.02 (0.01) ***
% homeownership	0.99 (0.00) ***	0.99 (0.00) **	1.00 (0.00)	0.99 (0.00) ***	0.99 (0.00) ***	1.00 (0.00)
% vacant units	1.02 (0.01) **	1.05 (0.01) ***	1.04 (0.01) ***	1.03 (0.01) ***	1.04 (0.01) ***	1.06 (0.01) ***
median home value	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)
median rent	1.00 (0.00) ***	1.00 (0.00) *	1.00 (0.00) ***	1.00 (0.00) ***	1.00 (0.00) +	1.00 (0.00) ***
% recent immigrants (city)				1.33 (0.05) ***	1.38 (0.05) ***	1.23 (0.09) *
% recent immigrants * 1990s				0.93 (0.03) *	0.90 (0.03) ***	0.84 (0.04) ***
N (tract-years)	6,666	5,690	3,546	6,666	5,690	3,546

Notes: \*\*\*p<.001; \*\*p<.01, \*p<.05, +p<.10.



Table 6. Results for Tract-level Models Predicting City-based Gentrification on Share of Recent Immigrants for Race Categories by Period (Odds Ratios)

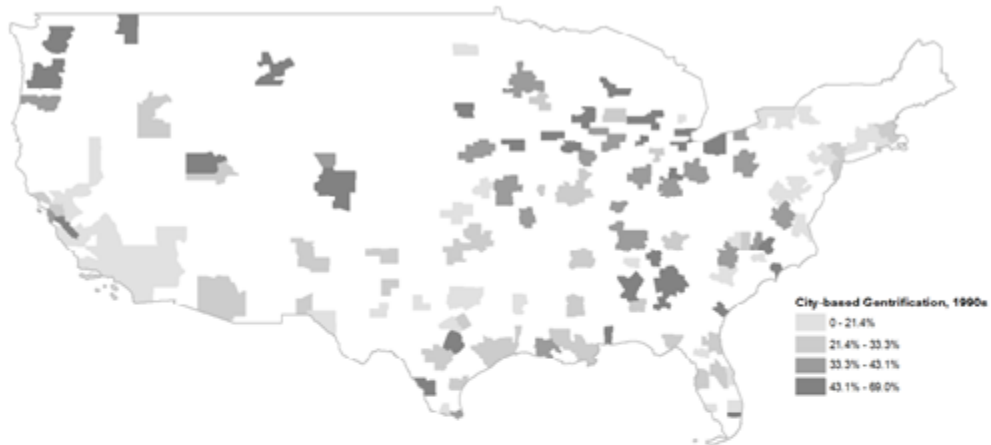
	(1)		(2)		(3)		(4)	
	(a) 1990s	(b) 2000s	(a) 1990s	(b) 2000s	(a) 1990s	(b) 2000s	(a) 1990s	(b) 2000s
% recent immigrants (tract)	0.97 (0.00) ***	0.94 (0.00) ***	0.98 (0.01) ***	0.93 (0.01) ***	0.97 (0.00) ***	0.94 (0.00) ***	0.95 (0.01) ***	0.93 (0.01) ***
Black	1.20 (0.17)	1.76 (0.14) ***	1.27 (0.19)	1.15 (0.16)	2.27 (0.20) ***	1.16 (0.20)	2.01 (0.20) ***	1.23 (0.20)
Other minority	0.65 (0.08) ***	1.36 (0.07) ***	0.71 (0.12) **	1.45 (0.11) **	1.10 (0.14)	2.07 (0.16) ***	1.02 (0.15)	2.03 (0.17) ***
% recent immigrants (tract) * Black			1.00 (0.01)	1.09 (0.01) ***			1.07 (0.02) ***	1.09 (0.01) ***
% recent immigrants (tract) * Other minority			0.99 (0.01)	1.00 (0.01)			1.02 (0.01) **	1.01 (0.01)
population (logged)	0.56 (0.06) ***	0.48 (0.06) ***	0.56 (0.06) ***	0.48 (0.06) ***	0.57 (0.06) ***	0.48 (0.06) ***	0.56 (0.06) ***	0.48 (0.06) ***
% non-Hispanic black	0.98 (0.00) ***	0.98 (0.00) ***	0.98 (0.00) ***	0.98 (0.00) ***	0.98 (0.00) ***	0.98 (0.00) ***	0.99 (0.00) ***	0.98 (0.00) ***
% below poverty	1.02 (0.00) ***	1.00 (0.00)	1.02 (0.00) ***	1.00 (0.00)	1.02 (0.00) ***	1.00 (0.00) ***	1.02 (0.00) ***	1.00 (0.00)
% homeownership	1.00 (0.00)	0.99 (0.00) ***	1.00 (0.00)	0.99 (0.00) ***	1.00 (0.00)	0.99 (0.00) ***	1.00 (0.00)	0.99 (0.00) ***
% vacant units	1.05 (0.01) ***	1.03 (0.01) ***	1.05 (0.01) ***	1.03 (0.01) ***	1.05 (0.01) ***	1.03 (0.01) ***	1.05 (0.01) ***	1.03 (0.01) ***
median home value	1.00 (0.00)	1.00 (0.00) ***	1.00 (0.00)	1.00 (0.00) ***	1.00 (0.00)	1.00 (0.00) ***	1.00 (0.00)	1.00 (0.00) ***
median rent	0.99 (0.00) ***	1.00 (0.00) +	0.99 (0.00) ***	1.00 (0.00)	0.99 (0.00) ***	1.00 (0.00)	0.99 (0.00) ***	1.00 (0.00)
% recent immigrants (city)	1.07 (0.01) ***	1.07 (0.01) ***	1.07 (0.01) ***	1.07 (0.01) ***	1.12 (0.01) ***	1.08 (0.02) ***	1.14 (0.02) ***	1.10 (0.02) ***
% recent immigrants (city) * black (tract)					0.91 (0.02) ***	1.06 (0.02) **	0.87 (0.02) ***	0.98 (0.02)
% recent immigrants (city) * other minority (tract)					0.94 (0.01) ***	0.96 (0.02) *	0.91 (0.02) ***	0.95 (0.02) **
N (tract-years)	15,902	15,902	15,902	15,902	15,902	15,902	15,902	15,902

Notes: \*\*\*p<.001; \*\*p<.01, \*p<.05, +p<.10.

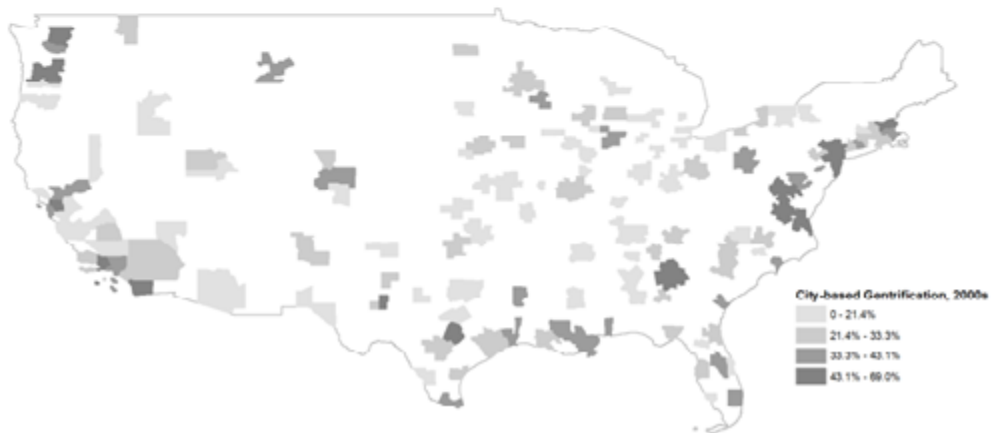
## Figures

**Figure 1.** Maps of the Prevalence of Gentrification across Metropolitan Areas from (a) 1990-2000 and (b) 2000-2012 (N = 151).

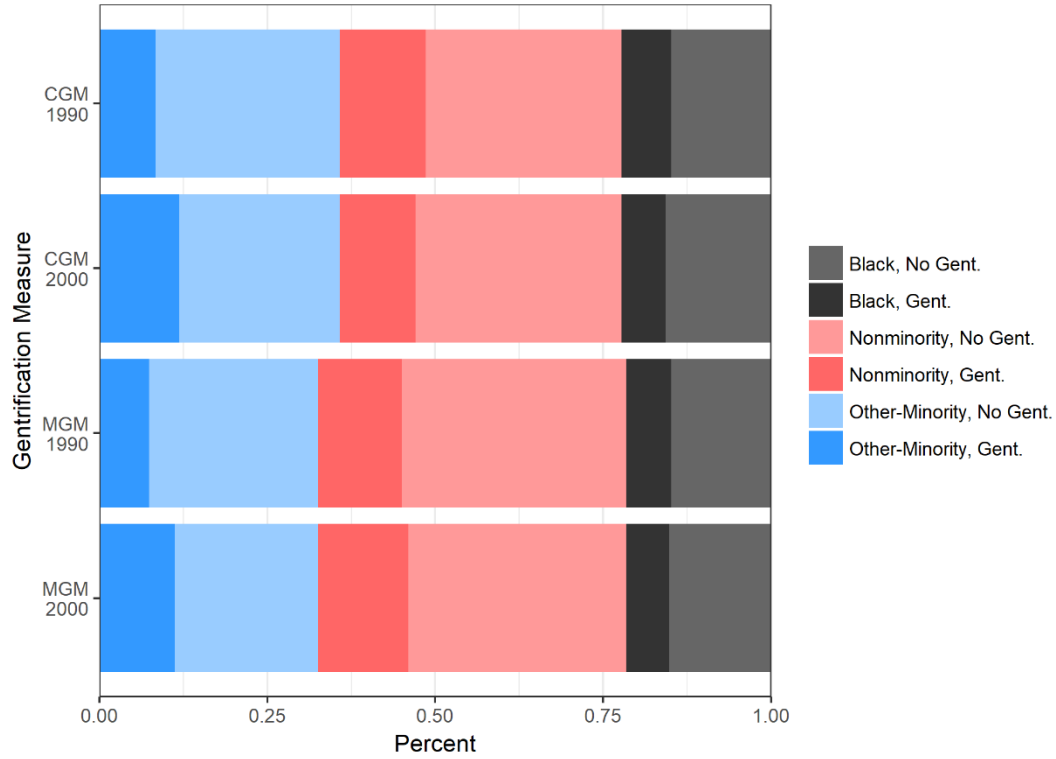
(a) Prevalence of City-based Gentrification, 1990s



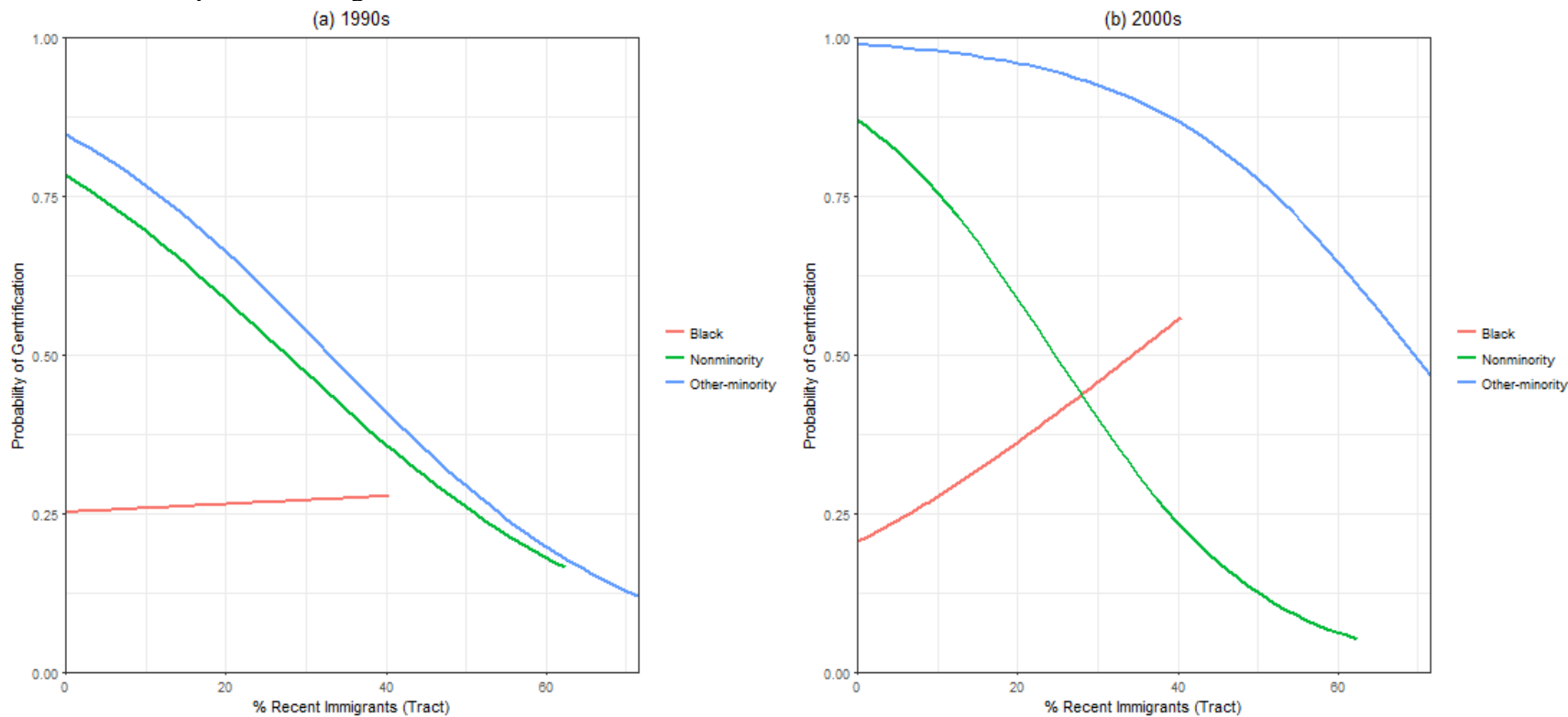
(b) Prevalence of City-based Gentrification, 2000s



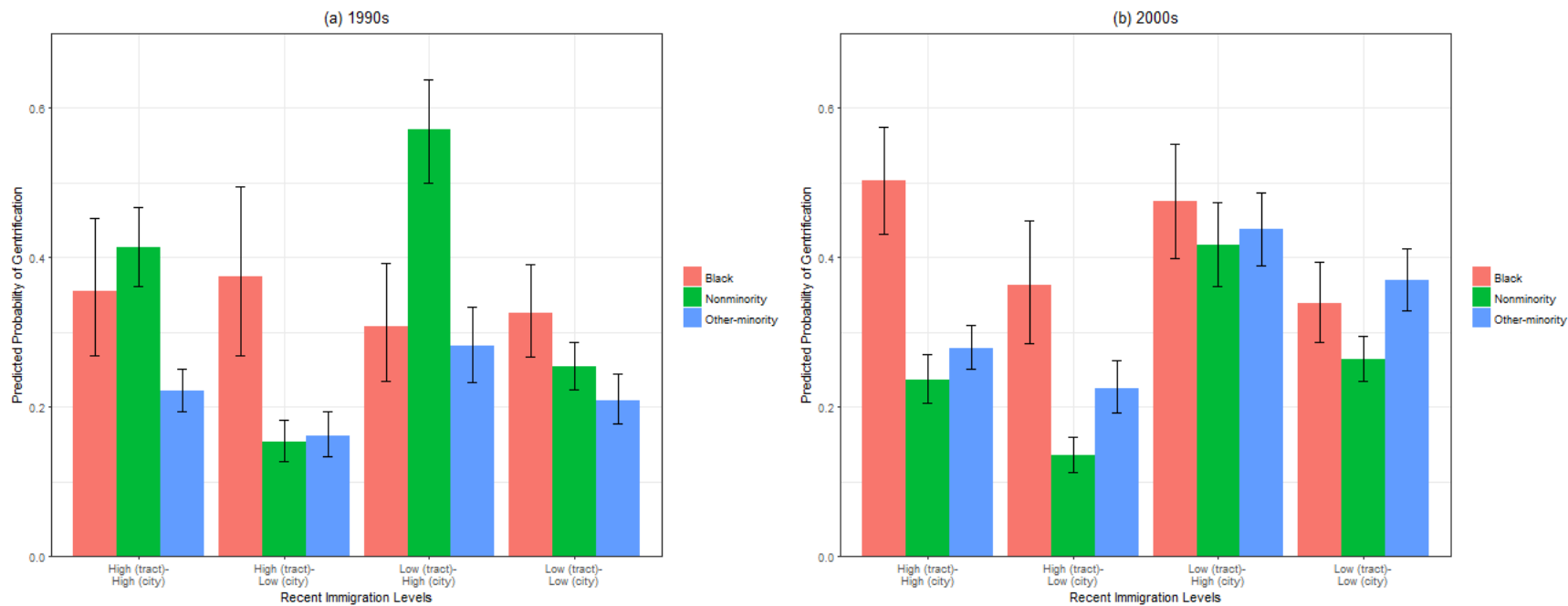
**Figure 2.** Prevalence of Gentrification among Gentrifiable Tracts by Neighborhood Composition Category for City-Based Gentrification (N=7,951) and Metropolitan-Based Gentrification (N=9,370) by Decade



**Figure 3.** Predicted Probability of Gentrification by Share of Recent Immigrants to Tracts based on Fixed Effects Logistic Regression Models for Composition Categories



**Figure 4.** Predicted Probabilities of Gentrification by Immigration Levels for Neighborhood Composition Categories based on Fixed Effects Logistic Regression Models for all Gentrifiable Tracts by Decade



## Appendix

Table A1. Ethnoracial Compositions of Gentrifiable Tracts by Composition Category

	<u>1990</u>				<u>2000</u>			
	Mean	SD	Min.	Max.	Mean	SD	Min.	Max.
<b>Black (N=1,773)</b>								
% non-Hispanic white	5.04	6.24	0.02	28.69	4.34	6.09	0.00	65.71
% non-Hispanic black	90.94	8.16	70.05	99.88	89.18	10.94	16.51	99.66
% Hispanic	3.21	5.19	0.00	27.69	5.20	8.28	0.00	51.63
% Asian	0.50	1.35	0.00	18.70	0.78	2.02	0.00	31.74
% foreign-born	4.40	9.47	0.00	65.24	6.48	11.01	0.00	62.93
<b>Other minority (N=2,845)</b>								
% non-Hispanic white	21.57	15.69	0.11	49.98	15.58	13.61	0.21	74.64
% non-Hispanic black	23.89	22.39	0.00	69.83	23.05	23.09	0.00	90.13
% Hispanic	46.55	28.07	0.13	98.84	52.00	28.68	0.31	98.86
% Asian	7.09	12.28	0.00	93.81	7.97	13.56	0.00	90.94
% foreign-born	27.13	19.10	0.00	82.35	32.08	18.83	0.00	82.78
<b>Nonminority (N=3,333)</b>								
% non-Hispanic white	75.85	13.27	50.02	99.42	61.86	19.00	6.88	98.08
% non-Hispanic black	9.78	10.61	0.00	48.26	14.01	14.80	0.00	80.67
% Hispanic	9.43	9.58	0.06	46.94	15.94	15.50	0.00	83.51
% Asian	3.68	4.46	0.00	39.87	5.77	6.78	0.00	66.85
% foreign-born	9.95	10.58	0.00	68.97	15.70	13.99	0.00	79.60

Table A2. Top 10 MSAs by Number of Gentrifying Tracts by Racial/Ethnic Composition Category

City Name	1990		City Name	2000	
	Gentrifiable	Gentrifying		Gentrifiable	Gentrifying
<b>Black</b>					
Chicago, IL	190	71	New York, NY	197	121
Detroit, MI	109	62	Chicago, IL	190	57
New York, NY	197	44	Washington, DC	75	38
Philadelphia, PA	88	28	Philadelphia, PA	88	26
Cleveland, OH	52	27	New Orleans, LA	61	23
Atlanta, GA	55	24	Atlanta, GA	55	23
Memphis, TN	54	20	Detroit, MI	109	19
Indianapolis, IN	27	18	Baltimore, MD	62	16
St. Louis, MO	33	13	Newark, NJ	23	14
New Orleans, LA	61	13	Memphis, TN	54	13
			Houston, TX	58	13
<b>Other Minority</b>					
New York, NY	566	123	New York, NY	566	229
Chicago, IL	157	82	Los Angeles, CA	432	160
San Antonio, TX	123	31	Chicago, IL	157	66
Houston, TX	140	27	San Antonio, TX	123	30
San Jose, CA	63	26	San Francisco, CA	62	28
Denver, CO	32	24	Houston, TX	140	27
San Francisco, CA	62	21	San Diego, CA	63	23
Phoenix, AZ	54	19	Oakland, CA	35	21
Los Angeles, CA	432	18	Dallas, TX	75	18
Dallas, TX	75	18	Austin, TX	28	15
<b>Nonminority</b>					
New York, NY	279	89	New York, NY	279	121
Portland, OR	64	37	San Diego, CA	73	47
Austin, TX	54	29	Portland, OR	64	30
Colorado Springs, CO	45	26	Philadelphia, PA	63	29
Indianapolis, IN	69	25	Austin, TX	54	23
Seattle, WA	46	23	Los Angeles, CA	38	22
Columbus, OH	69	22	Virginia Beach, VA	48	22
Phoenix, AZ	112	22	Phoenix, AZ	112	21
Charlotte, NC	57	20	Seattle, WA	46	21
Minneapolis, MI	44	20	Baltimore, MD	28	19
			Boston, MA	41	19