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A Neighborhood-level Perspective of Real Estate Determinants in Three U.S. Cities

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Abstract

This study examines the relationships between commonly available socio-economic and environmental determinants of real estate (crime, quality of schools, racial/ethnic diversity, and built environment) and real estate values in socially and politically recognized units in the three largest cities of the U.S.—New York, Los Angeles, and Chicago. Utilizing a variety of data sources used by potential real estate buyers, we conduct correlations, mapping, and multiple regression analyses to identify the degrees and strengths of associations between select determinants and real estate values at these politically recognized units. Results suggest that the cities exhibit similar patterns for crime-related characteristics and quality of schools. However, the characteristics such as population density, vacancy rates, and especially the ethnic/racial diversity of these recognized units demonstrate nuanced differences with real estate values across the three cities.

Keywords

Real estate, Racial/ethnic diversity, Built environment, Socially and politically recognized units

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1. INTRODUCTION

Real estate values depend on geographic location, internal physical attributes, home design, and their broader environmental and neighborhood characteristics. The commonly used determinants of real estate values include the number of bedrooms and bathrooms, quality of construction materials, condition of a building and its age, yards, open spaces and views, the social reputation/perception of a neighborhood and its relative location within a larger area, proximity to amenities such as highways, groceries, restaurants, shopping malls, green spaces and parks, water bodies, road/railroad infrastructure (and noise), public transportation, schools and school quality, access to jobs, commute times, and other factors that may affect quality of lives of the residents (Brown and Chung 2008; Clark 2006; Cohen et al. 2015; Din et al. 2001; Sharma 2016, 2018; Sultana 2002; Vandegrift et al. 2012; Zhou et al. 2015).

An important but intangible and non-quantifiable characteristic of a residential area is its social reputation, which gets constructed based on public opinions and perceptions of these neighborhoods from short- and long-term lived-in experiences of residents and visitors, and their interactions with each other while dealing with and sorting out numerous social, economic, and cultural issues (Sampson 2012). Such reputations, sentiments, and perceptions about specific neighborhoods, in turn, affect peoples' decisions to change their residence and/or to invest in specific properties (Lee et al. 1994). These reputations reinforce stereotypes about neighborhoods that further accentuate spatial inequalities among and within cities, potentially affecting their long-term sustenance and negatively affecting their recovery from such negative perceptions (Hartigan 2010). Perceived disorganization of a neighborhood, regardless of objective indicators, can also influence its image over time. For example, people's perceptions of criminality and other elements of social disorganization strongly affect their satisfaction levels (Adams 1992). Nevertheless, the number of crimes, crime rates, or at least the qualitative perceptions of these indicators comprise integral parts of a neighborhood's description on realtor websites that may affect prospective buyers' home buying decision-making process.

This study explores the relationships between real estate values and the most commonly available and searchable variables on realtors' websites at the locally accepted definition of a neighborhood/community in the three largest cities of USA. By using these socially and politically recognized units as the scale of analysis, we explore the ways in which their regional setting differences might produce similar or nuanced differences in the degrees of associations between real estate and community-level determinants that are unique to each of these cities, even though they largely capture broader demographic, socio-economic, built-environment and crime-related characteristics. Given the unique definition of neighborhood/community in each of these cities, and unavailability of compatible/similar variables across these cities at our chosen scale of analysis, we use each city as a case study to explore these relationships at length. We also conduct multiple regressions analyses to corroborate and re-emphasize our findings from the correlations and mapping analyses of the relationships between real estate values and neighborhood determinants.

The rest of the paper follows in four sections. Literature review summarizes important scholarly work in four subsections—criminality in urban areas, quality of

schools, racial/ethnic diversity, and built environment. We chose to discuss these four determinants due to accessibility of these data/information on most realtors' websites. Research design details the rationale for our study area, scale of analysis, data sources, and the methodological steps. The analyses and findings section illustrates findings from the correlations, cartographic and regression analyses. Finally, the conclusions and implications section recapitulates the identified relationships between select determinants and real estate values.

2. LITERATURE REVIEW

2.1. Criminality in Urban Areas

Criminality in communities can affect prospective homebuyers' decisions due to its direct and indirect effects on real estate values. According to Shaw and McKay (1942), poverty and housing instability affect crime rates by inducing social disorganization, which prevents local residents from tackling crime-related issues within their neighborhoods. This theorization was later on elaborated by Sampson et al. (1997) who demonstrated that collective efficacy can help overcome the negative impacts of instability and adversity due to violent crimes in local communities. Later on, other scholars also expanded on the social disorganization theory by discussing empirical evidence from Columbus, Ohio (see Peterson et al. 2000). They indicated that the presence of amenities such as recreation centers, bars, grocery stores, etc. in neighborhoods attribute to decrease in violent crimes which eventually translate into increased collective efficacy.

Criminality also acts as an important catalyst for negative changes in the social and economic characteristics of local communities. Although such a change takes place over a longer period, criminality *capitalizes* itself negatively in local housing markets at a relatively faster rate, while affecting the poor, the middle-class, and the affluent neighborhoods to different degrees (Tita et al. 2006). In the 1990s, the U.S. experienced a substantial decline in criminality in the most deprived neighborhoods, which also had noticeable effects at the national level. These changes led to gain in residential real estate values. Pope and Pope (2012) found that in zip codes with crime rates above the 90^{th} percentile, a decline in crime rates caused real estate prices to increase by approximately 7-19% throughout the 1990s. While this study was interesting in itself, its lack of geographic referencing made it difficult to assess if decline in criminality had similarly affected real estate values within the city limits versus the suburbs.

Concerning spatio-temporal understanding into property valuation and crime-types, Hipp et al. (2009) found that higher rates of violent and property crimes in a census tract led to an increased level of property sales in the following year. Moreover, the tracts with higher violent crime rates had cheaper real estate in the following year, making it possible to have higher sales. This adds an interesting dimension to the realm of property valuation and crime, in that on its very outset, higher property sales in more crime-affected areas do not make sense; however, the immediate consequence of higher crime rates leading to higher property sales may happen as worried

homeowners may succumb to distressed selling. Buck et al.'s (1993) analysis of Atlantic City, New Jersey found that lowered crimes due to improved police services led to an increased demand in housing and hence increased property values. In yet another study on Atlantic City, casinos had a negative effect on real estate since the authors (Buck et al. 1991) found that the negative impact of crime diminished with increased distance from casinos; however, increased distance from casinos also had a depressing effect on housing values. The paradox, in this case, was caused by the attractiveness of newer development such as casinos, despite the increased risks of crime (ibid).

Some types of crimes may have a higher potential to negatively stigmatize certain areas. Crimes of clandestine and protracted nature such as the presence of methamphetamine laboratories may significantly affect housing prices, with almost a 10-19% decline within one year of discovery of such laboratories (Congdon-Hohman 2013). Likewise, the presence of sex offenders or prostitution/human traffickers within close proximity of a neighborhood may also affect real estate values, given these being widely searched by prospective buyers. However, in our treatment of crime-types in this analysis, we limit ourselves to analyzing the real estate determinants based on the available data-types at our scale of analysis.

2.2. Quality of Schools

Quality of public schools is one of the most significant predictors of real estate values. Private schools tend to have better performance (Bankston and Caldas 2000; Dronkers and Robert 2008), but details regarding private schools performance are not included in neighborhood reports. School quality attributes such as SAT, ACT, and graduation rates are often available on realtor websites, and these influence prospective buyers' decisions, especially for families with children. However, many buyers without children also pay attention to the quality of schools, given its positive association with real estate value appreciation (Hilber and Mayer 2009; Downes and Zabel 2002; Uyar and Brown 2007). A survey of 1,000 prospective homebuyers conducted in 2013 by Move, Inc. revealed that 91% of respondents had indicated the importance of school districts in their search process. Consumers were willing to sacrifice certain characteristics of homes to live in good school districts, with almost 20% of homebuyers willing to pay 6-10% higher than their planned budget, and about 10% of buyers willing to increase their anticipated expenses by almost 20% (DeBord 2016). According to the National Association of Realtors, the quality of school districts is the fifth most important factor when choosing a residential neighborhood across all age groups (Lautz et al. 2017). However, these may vary geographically based on the relative importance of this factor by its residents and their race/ethnicity (Sharma 2016, 2018).

While one of the main consequences of having good schools is the potential increase of property values, it also leads to higher property taxes. Using a sample of several school districts, Brueckner (1979) concluded that reduction in property taxes and expenditures on schools would increase housing values. Homeowners, however, generally prefer higher expenditures per student as long as their taxes remain the same.

Market research by Trulia suggests that 35% of Americans with children under 18 desire for homes in good school districts, whereas 12% of those without children

also desire for the same, since resale values of homes get a boost from the presence of good schools (Hilber and Mayer 2009). Bogart and Cromwell's (1997) analyses of housing values in three neighborhoods of Cleveland metropolitan area found that housing values held varying premiums based on school district's reputation such as appearance of a building, teachers' skills and qualifications, available extracurricular activities, and academic performance of students. Interestingly, Black's (1999) analysis of homes located in adjacent school districts also found value in this location premium. Surveys on the quality of schools, however, are rarely conducted, making researchers rely on rarely accessible parameters such as per-capita spending, academic performance, student/teacher ratio, and the like (Brasington 1999).

Potential buyers are more likely to look at students' performance as the main indicator of school quality (Crone 1998). Regarding higher real estate values, many scholars have also used other attributes that reflect school quality which are defined by academic performance of students such as their test scores (Clapp et al. 2008; Clark and Herrin 2000; Crone 1998; Davidoff and Leigh 2008; Dougherty et al. 2009; Figlio and Lucas 2004; Neilson and Zimmerman 2014; Reinhard 1981) and higher enrollment in high-quality school districts (Bonilla et al. 2015). Overall, thus, the significance of school districts for real estate prices remain strong, and based on the available data for school quality at our chosen scale of analysis across the three cities, we explore the relationships between real estate and school quality to gain insights into regional differences.

2.3. Racial/ethnic Diversity

In the U.S., segregation has strategically excluded Blacks and other minorities from high-quality residential areas, depriving largely African American and Latino neighborhoods of numerous municipal services and private investments (Brown and Sharma 2010; Sharma 2016). Even middle-class majority-minority neighborhoods have suffered from lower housing values, slower value appreciation, low-quality amenities, poorly performing public schools, and relatively higher crime rates compared to their white counterparts (Pattillo 2005). For example, Prince George's County in Maryland, the county with the richest African American community in the country, lacks basic amenities such as department stores, restaurants, etc. that are commonly available in comparable white communities (Turner 2009). Developers have generally been less inclined to invest in majority-minority areas and lenders have used this toward their advantage by offering high-rate, subprime predatory mortgages (Oliver and Shapiro 2006). As such, housing values and property tax revenues lag far behind in majority-Black neighborhoods, thence limiting their ability to attract high-quality services. Despite overall well-being, the schools in Prince George's County lack funding, rank lower in academic performance, and have problems in attracting and retaining qualified teachers and management personnel (Turner 2009). In addition, majority-minority middle class areas are more vulnerable to disadvantage-related issues compared to white neighborhoods due to their proximity to poorer areas (Pattillo 2005). At similar income levels, African Americans suffer more from higher crime rates compared to white communities (Crutchfield et al. 2006), even though higher crimes

are also due to institutional and structural factors rather than simply race/ethnicity (Shihadeh and Shrum 2004).

Racial segregation creates concentrated poverty due to African Americans' limited affordability of residential choices (Massey and Denton 1993). Although segregation has been declining since the 1970s, large scale job losses and rising unemployment, especially since the economic restructuring of the 1970s, has disproportionately affected minorities by spatially isolating them into inner-city neighborhoods (Brown and Chung 2008; Sharma and Brown 2012). In contrast, comparable poorer white households are spatially much more dispersed, negating the bad effects of concentrated poverty and disinvestments (Kingsley and Pettit 2003). Majority-minority neighborhoods also suffer from limited long-term prosperity (Sharma 2017a, 2017b) as it caps the appreciation of housing values and wealth accumulation especially among minority homeowners (Engel and McCoy 2008). It also undermines the quality of public schools and educational attainment among minorities (McKoy and Vincent 2008) which further limits their employment opportunities and earned incomes (Turner 2008), and the cycle of poverty and deprivation continues. These inequalities subsequently lower housing values and property tax revenues (Harris 1999), and support racial stereotypes and socio-economic polarization (Polikoff 2006).

There are several empirical studies specifically on race/ethnicity and housing price appreciation. Howell and Korver-Glenn (2018), for example, suggest that the housing appraisal industry is inseparably linked to the racial composition of a neighborhood. Their analysis indicates that relatively similar homes in terms of various amenities and neighborhood characteristics (e.g., housing demand, schools, distance to parks, commute times, crime, poverty, unemployment, etc.) were valued systematically lower in Black and Hispanic communities of Harris County, Texas. In Philadelphia, predominantly white neighborhoods that have experienced a substantial increase in the share of African Americans have lower levels of real estate appreciation than comparable white neighborhoods without significant changes in their racial composition (Moye 2014). When it comes to long-standing diversity, Moye and Thomas (2018: 109) reveal that "…stable integrated neighborhoods have rates of appreciation slightly higher than predominantly white neighborhoods." Given these relationships between diversity and real estate, we use this variable across three cities to examine its nuanced regional effects.

2.4. Built Environment Characteristics

We consider population density and residential vacancy rate as built environment characteristics since they differentiate areas based on their housing stock. In general, the relationship between built environment and real estate is quite complex. Diao and Ferreira (2010) claim that higher population density is positively associated with housing prices (in Boston MSA). Similarly, Palm et al. (2014) document that population density has a positive relationship with the values of rent, home purchases, and mortgage payments. However, they warn that population density varies greatly among metropolitan areas (they study households in 23 most densely populated states) and thus aggregate results may not be true for more granular geographies. Miles (2012)

suggests that increased population density leads to corresponding price changes along with a decline in housing supply, until and unless new stocks get added. At the same time, rising housing values reduce consumption and ownership, whereas rentership might increase (Skaburskis 2000). Negative externalities associated with population density lead to a decline in housing prices (Glaeser et al. 2005b). In contrast, amenities help support higher population density which eventually get capitalized into higher housing values (Rappaport 2008).

Some scholars claim that artificial constrains toward urban sprawl might increase housing values (Glaeser et al. 2005a; Kulish et al. 2012) since such urban containment policies may limit the supply of housing. Others, however, argue that this type of zoning restrictions may not have pronounced effect on real estate (Jun 2006; Phillips and Goodstein 2000). Higher real estate values may eventually create higher vacancy rates, as has been the scenario in the most expensive and unaffordable central-city real estate in New York. Hwang and Quigley (2006) posit the importance of vacancy rates in predicting housing prices. Caplin and Leahy (2011) suggest a positive correlation between vacancies and future price growth, since large inventory predicts greater price appreciation. As such, we include this variable (i.e., vacancy rate) in our analysis.

Finally, the literature summarized above suggests numerous types of relationships between the four major factors considered in this analysis. While certain types of crimes have clear and defined relationships with real estate, others are more succinct, and their relationships with real estate may change based on their regional referencing and scale of analysis. Same is the case with racial/ethnic diversity that holds different meanings and relationships with real estate, depending upon the type of city and region being studied. Also, the fact that the built-environment variables (population density, vacancy rates, rentership, etc.) may also affect real estate pricing, prospective buyers also consider the quality of schools in neighborhoods and communities when making home-buying decisions, and often their decision-making process is a complex and balancing act wherein they weigh the pros and cons of the above four factors based on their specific needs. In this analysis, we explore these nuanced relationships between real estate (four types) and four major categories of explanatory variables in three distinct cities. By doing so, we hope to flesh out the regional, urban ecological and, historical differences within and across the three cities.

3. RESEARCH DESIGN

3.1. Study Area

For this analysis, we chose the three largest cities (exclusively within municipal boundaries) from three different regions of the U.S.—New York City in the Northeast, Los Angeles in the West, and Chicago in the Midwest. These three largest cities with comparable population have the three largest housing markets in the nation. They exhibit the attributes of global cities in terms of overall potentials of economic diversity and socio-economic dynamism—thence classified as the “Alpha” cities according to the Globalization and World Cities Research Network (GaWC). These cities have enormous diversity, especially in terms of race/ethnicity, nationality, income, poverty rates,

housing markets, economic opportunities, and are large enough to serve as excellent laboratories for exploring the relationships between real estate values and their determinants at our chosen scale of analysis. A wide geographical variation of our study area is driven by the desire to identify ubiquitous trends while also identifying regional peculiarities that associate with various determinants of real estate prices. In addition, these three cities have had different colonial histories, and they illustrate different stages of urban growth and socio-economic prosperity (Beveridge 2011; Myers 1999). For example, New York and Chicago have already experienced periods of depopulation within city limits, but Los Angeles exhibits different patterns. A working hypothesis used in this study suggests that in each city, besides the general market trends, there exists a unique set of factors and mechanisms, given their varying levels of local ordinances, natural and socio-economic conditions, and magnitudes of urban sprawl. By choosing these three cities from three distinct regions with varied history and urban ecology, we capture the unique as well as generalizable aspects of American large cities' real estate determinants.

3.2. Scale of Analysis

We use unconventional scale of analysis in the three cities which pertain to the broader definition of neighborhoods/communities that are better identifiable and accepted by local people; these are also the more commonly used definitions by the real estate industry. In New York, we use its 188 spatial cells called *tabulation neighborhood areas* (TNAs) which are planning units designed by the New York City Department of City Planning. We exclude airports, parks, cemeteries, and prisons from consideration. For Los Angeles, we use a special mapping source (Los Angeles Time, Mapping L.A.), which divides the city into 88 *neighborhoods*. For Chicago, we use the widely accepted *community areas* as our scale of analysis. A community area is a unit represented by groups of smaller neighborhoods. This division has been adopted in Chicago since the 1920s, and has undergone several revisions since then (Seligman 2005). These neighborhoods are officially formalized and accepted at the municipal level. There are 77 *community areas* in all, but we unify two pairs of these into one due to data discrepancy in several attributes. As such, in our analysis, Englewood comprises of West Englewood and East Englewood combined, and Garfield Park consists of West Garfield Park and East Garfield Park combined. Thus, this analysis focuses on 75 *community areas* in Chicago. Data for the combined community areas were accordingly adjusted. Overall, then, the scales of analyses in this study comprise the 188 *TNAs* in New York City, 88 *neighborhoods* in Los Angeles and 75 *community areas* in Chicago—unique and well accepted in these three cities. Our decision to choose such divisions as the scale of analysis was driven by the fact that these units are somewhat commensurate and can be compared because their areas and populations are of the similar magnitude, and are more recognized, identified, and accepted by locals when selecting homes as opposed to census tracts.[1]

[1] Census tracts, the more commonly used scale of analysis in housing research, lack personification and identity, and changes boundaries over time. Census tracts are also too small

3.3. Data and Sources

For realistic account of property values, we use three indicators of price—median sales price, price per square foot, and median monthly rent—data for which were obtained from Zillow and Trulia (see Goodman's (2018) work using Zillow data). We use these three price indicators for a better approximation of real estate values since just one is not accurate. Later, we combine them into one 'combined index' to use it as a dependent variable in multiple regressions. Since those websites are updated periodically, the data were gathered very quickly during April 11-16, 2017 across the three cities for temporal market consistency. The four major categories of determinants used in this analysis are also the most commonly available indicators on realtors' websites used by prospective buyers. Thus, instead of using a long list of variables used in conventional housing research, we limit ourselves to these four categories of determinants for thorough understanding of real estate at our chosen scale of analysis.

Regarding crime statistics, though the Federal Bureau of Investigation (FBI) provides data on various crime-types for counties, metropolitan statistical areas, and individual municipalities, obtaining data for inner-city comparisons was difficult (FBI 2017). As such, for New York City, we used the open data from "I Quant NY" that provides data on homicide rate, number of homicides accumulated over ten years, and the aggregated ranking of neighborhoods by crime-types. The sum of ranks includes crime statistics on robbery, homicide, auto theft, grand larceny, burglary, and assault. The Los Angeles Times provides data for violent and property crime rates. The L.A. Times project entitled "A story for every victim" is a database of all homicide incidents in Los Angeles County since 2000. We used these data to calculate homicide rates, using population data from the census. The drawback of the data offered by Mapping L.A. (violent and property crime rates) is that it covers the period of last six months only, and hence data used here covers the period from October 10, 2016 to April 10, 2017. For Chicago, we used a specific section of the online version of The Chicago Tribune (Crime in Chicagoland) to manually collect crime data for all 75 community areas. The crime data pertained to three thematic groups: violent (robbery, battery, assault, homicide, sexual assault), property (theft, burglary, motor vehicle theft, arson), and quality of life (criminal damage, narcotics, and prostitution[2]). Data on school performance were not readily available for our desired geography since most data are presented at the level of school districts. In our study area, differentiation at the level of school districts is noted only in New York, which is divided into 32 districts, whereas Los Angeles and Chicago have single unified school districts. However, attendance boundaries are designed and thus it was important to differentiate quality of public schools at the level of neighborhoods. Due to these limitations, we used a website called "Niche: Explore Schools and Neighborhoods" that specializes in school rankings

spatial units for the purposes of our study, and their excessive fragmentation makes maps illegible and difficult to interpret. Moreover, this division does not have crime and school data.

[2] As of March 2018, this interactive mapping resource was removed from the website. As an illustration, there are some online articles with screens of the original appearance of Crime in Chicagoland (Codrea-Rado 2012; Herrera 2013).

based on a variety of statistical criteria. There are assigned weighted points to cities and neighborhoods by many categories including "Best Public Schools." Regarding school quality, yet another source is the Statistical Atlas which provides basic characteristics for various geographical scales. We collected the percentage of students in grades 9-12 enrolled in private schools for each neighborhood of Los Angeles and Chicago[3]. This variable may indirectly indicate the presence of private schools in neighborhoods.

Data on race/ethnicity and diversity were obtained from Niche, which provides information on diversity rank (i.e., ranging neighborhoods on a diversity spectrum) for Los Angeles and Chicago. Also, we collected diversity index for each neighborhood of New York and Los Angeles. This index shows the probability of two randomly selected residents to belong to different race. If all residents belonged to one group, diversity index is zero. Diversity index for New York was obtained from an open map in ArcGIS Online and diversity index for Los Angeles was obtained from Mapping L.A.

Concerning built environment variables such as population density and vacancy rate, data for these were obtained from the Census FactFinder of the NYC Department of City Planning. For Los Angeles, we extracted residential vacancy rate from AreaVibes whilst population density was collected from Mapping L.A., The Los Angeles Times. Data for Chicago were obtained from the Chicago Data Portal (population density) and the Chicago Rehab Network (residential vacancy rate).

3.4. Methodological Steps

Given that the price indicators were collected from Trulia and Zillow, we calculated the mean value for each neighborhood of the three cities.[4] This adjustment was necessary because the acquired data were from two similar but still different sources. Thereafter the Pearson's correlation coefficients were computed to gain insights into the bivariate relationships between these three price indicators, the combined price index and other determinants across three cities (Tables 1–4). In some cases, we had to calculate rates per 100,000 residents since the data were presented as absolute values (e.g., crime rates in Chicago, homicide rate in Los Angeles). We then mapped these variables to obtain further insights into the spatial patterns and trends of these relationships. Finally, we employed linear regressions for each city to explore the relationships between the three indicators of real estate values and their determinants. As noted above in the data section, the number and nature of variables somewhat differed across the three cities due to our chosen scale of analysis, making it difficult to have a strictly comparative analysis. However, using the limited numbers of available variables for each city, we conducted multiple regression analyses that primarily re-emphasized and corroborated our results obtained from the bivariate correlations.

[3] Data by TNAs of New York are not available on this website.

[4] All price indicators used here are mean values of data obtained from the two websites (Zillow and Trulia) since these mean values are the closest to the reality.

4. ANALYSIS AND FINDINGS

4.1. Cartographic and Correlations Analyses of Crime

The correlation analysis of real estate and crime data is presented in Table 1. In New York, it reveals a negative relationship, with r-values that are relatively low compared to Chicago or Los Angeles (e.g. r-values of –0.308, –0.274, –0.275 and –0.418 respectively for the four variables), even though these are all statistically significant. There exists a positive (and insignificant) correlation between the aggregated rank of six crime-types and price indicators. For New York, results suggest that Brooklyn (especially its western part) is an outlier with several TNAs closer to the East River where price indicators are comparable to the most expensive TNAs of Manhattan (Figure 1). However, those in Brooklyn are more crime-ridden (Figure 2) despite being expensive. This discrepancy may be due to close proximity to Manhattan and the exemplary views of the skyline. In general, there is a negative association between real estate and crime, and it is much more pronounced in the outskirts of New York, located at a distance from Manhattan (discussed below).

Table 1. Correlations analyses between crime-types and real estate indicators

	Med. sales price	Price per sq.ft	Med. rent	Combined ind.
New York City				
Homicide Rate	–0.308**	–0.274**	–0.275**	–0.418**
Crime Rank	0.121	0.071	0.110	0.287**
Los Angeles				
Violent Crime	–0.355**	–0.324**	–0.392**	–0.487**
Property Crime	–0.145	0.039	–0.008	0.089
Homicide Rate	–0.230*	–0.220*	–0.320**	–0.384**
Chicago				
Violent crime	–0.619**	–0.612**	–0.434**	–0.701**
Robbery	–0.534**	–0.513**	–0.341**	–0.588**
Battery	–0.415**	–0.402**	–0.266*	–0.458**
Assaut	–0.392**	–0.378**	–0.227*	–0.431**
Homicide	–0.428**	–0.414**	–0.301**	–0.467**
Sexual assault	–0.161	–0.041	0.055	–0.144
Property crime	–0.153	–0.121	0.096	–0.157
Theft	0.214	0.318**	0.468**	0.246*
Burglary	–0.101	–0.123	0.089	–0.154
Motor vehicle theft	–0.120	–0.084	0.090	–0.123
Arson	–0.346**	–0.331**	–0.241*	–0.363**
Quality of life crime	–0.661**	–0.676**	–0.468**	–0.769**
Criminal damage	–0.236*	–0.215	–0.030	–0.270*
Narcotics	–0.318**	–0.284*	–0.204	–0.313**
Prostitution	–0.225	–0.211	–0.140	–0.208

** Correlation is significant at 0.01 level (2-tailed); * Correlation is significant at 0.05 level; Combined index (Tables 1-4) is the dependent variable in multiple regression analysis

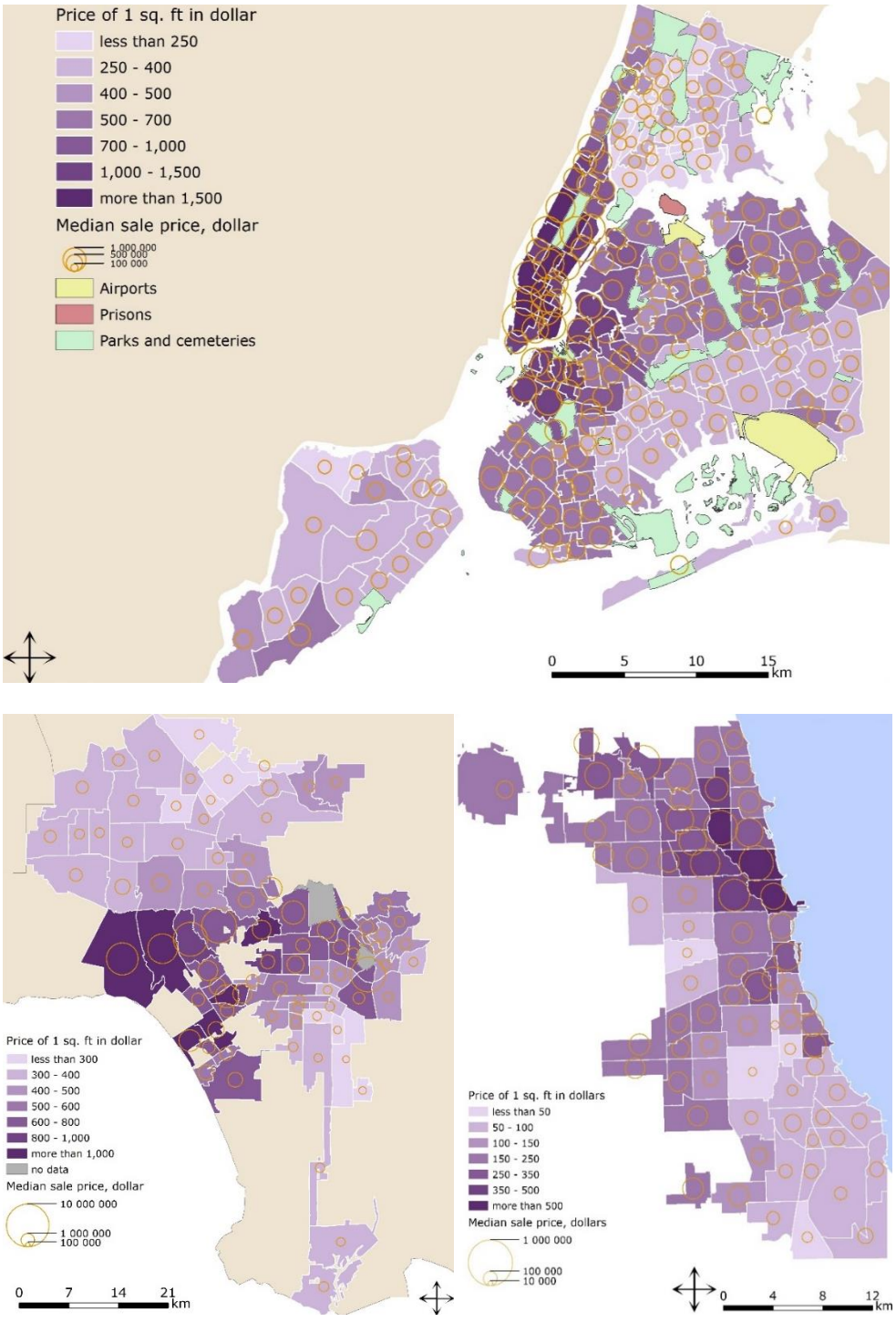

Figure 1. Real estate price indicators (top—New York, bottom left—Los Angeles, bottom right—Chicago)

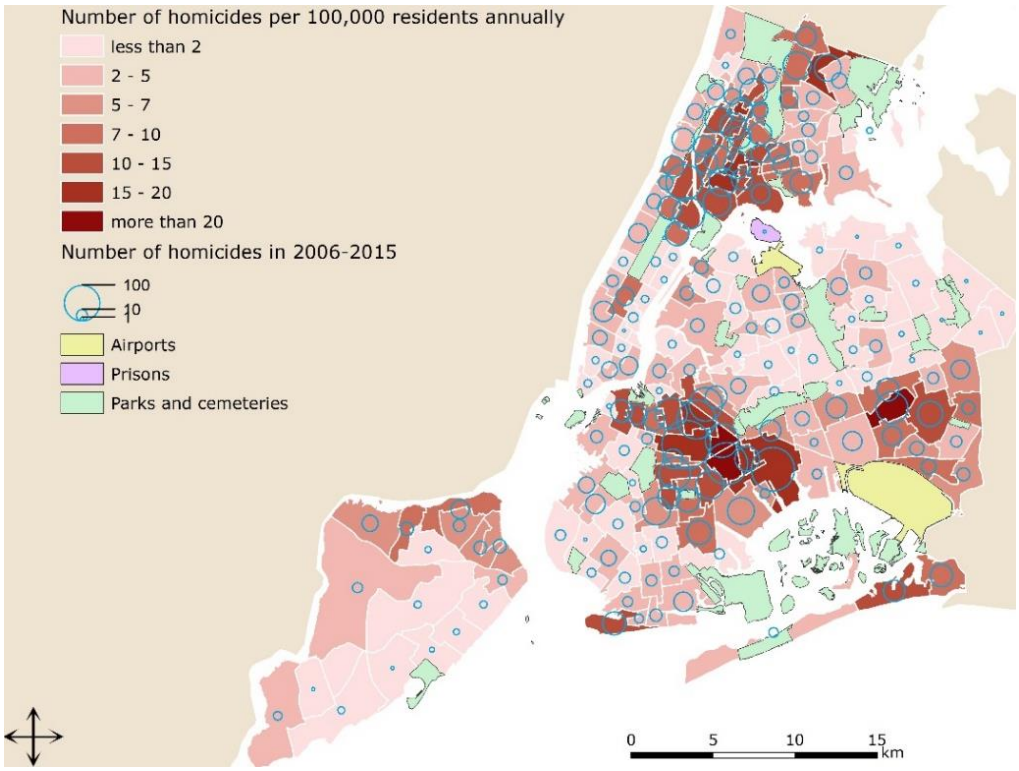

Figure 2. Homicide rates by New York's TNAs (LA's map is available upon request)

In Los Angeles, the correlation between homicide rate and real estate values is negative and significant. Moreover, the crime data for this city is for two categories, violent and property, and they differ noticeably not only by p-values, but also by the direction of their relationship with real estate values. In other words, violent crimes have a significant negative correlation with real estate prices, but property crimes do not necessarily follow this trend since the correlations are slightly negative though insignificant. The price per sq. ft. variable and the combined price index have r-values higher than zero, but also statistically insignificant.

In the case of Chicago, this trend is more apparent. One might assume that property crimes are somehow drawn to community areas with more expensive real estate. This is demonstrated by weak negative correlations between real estate and specific types of property crimes, and positive correlations with thefts (Table 1), which is telling in itself. Therefore, based on the results for Chicago, we develop the assumption, elaborated later in the multiple regression analysis section, that property crimes may be somehow attracted to well-off neighborhoods. Further analysis suggests that among various types of property crimes, arson stands out the most, given this offense is aimed directly against the actual physical property. In addition, it is difficult to investigate and/or implicate someone for arson-related crimes, and in general such crimes have a lower conviction rate (O'Connor and Redsicker 1996). Also, the maps of Chicago (Figure 3) show that property crime rates demonstrate a somewhat different spatial pattern than the other two groups. Such crimes are most concentrated in downtown and its surroundings. Affluent Northside does not differ substantially from

disadvantaged Southside. In contrast, other types of crime have two distinct clusters: a large one in Southside and a small one toward western boundary of Chicago.

The correlations coefficients for all types of crime or combined crime rate[5] are lower than that for the three groups considered independently. Partly because of that, the central business district (CBD) of Chicago—the Loop—ranks first in terms of the combined crime rate (number 7 in terms of absolute values; Figure 3). Because of a higher concentration of various activities and relatively smaller permanent population, a high rate of offenses exists in the CBD despite expensive housing. Among other reasons, there is a high demand for housing, as this community area is particularly attractive, even though it mostly contains commercial buildings. Similarly, in New York, aggregate crime (six types; not shown) is much more pronounced in four cores, namely, large cores of Downtown and Midtown Manhattan and smaller cores of Downtown Brooklyn and Queens Plaza. Thus, we infer that CBDs can be potential secondary cores of concentrated crime even though they contain some of the most expensive housing.

Due to more pronounced correlations than in New York and Los Angeles, it is reasonable to assume that in these cities there are different magnitudes of crime than those in Chicago. The homicide rates are available for all the investigated cases. In the two most dangerous neighborhoods of northern Brooklyn, homicide rate ranges between 23-28 per 100,000 residents (Figure 2), whereas it varies between 24-32 in the most dangerous neighborhoods of Los Angeles; in contrast, three community areas in Chicago have homicide rates of 150-165. Thus, we conclude that it is important to look at not just the average rates of such crimes or rank order of a particular neighborhood and its local reputation, but also at the value(s) and meanings of the indicator itself. For example, South Los Angeles, also known for its infamous 1992 riots, is the most dangerous area of the city. However, in Los Angeles as a whole, the correlations are lower, since the gap between the extremes is not as big as in the case of Chicago.

Recently, an analysis on income and property crimes in the cities of Nashville, Portland, and Tucson has demonstrated that as the gap in the incomes of adjacent census block groups widened, the rates of property crimes in the richer block groups increased (Metz and Burdina 2018), and fewer property crimes occurred in the poorest census block groups, all else being equal. This finding suggests that poorer neighborhoods may have fewer valuables to be potentially stolen. This finding somehow also supports our assumption that an apparent positive relationship between thefts and real estate price indicators is true. Nevertheless, this conclusion was drawn based on the research that had income as a dependent variable, whereas our study uses real estate values. A quick look at the relationship between housing values and income suggest that the two have significant positive correlations in Chicago (r-value is 0.69 for the median sales price, 0.77 for price per sq. ft., and 0.70 for median rent). Another possible explanation is that stealing right next to one's place of residence seems less appealing because of consequences and/or retaliatory actions against a perpetrator. Further, some minor thefts and minor property crimes may not be reported to the authorities, masking the real picture, and people with a criminal

[5] –0.44 for median sales price, –0.42 for price per sq. ft., and –0.19 for median rent

background may be less likely to contact the police if a property crime against them was not of serious nature.

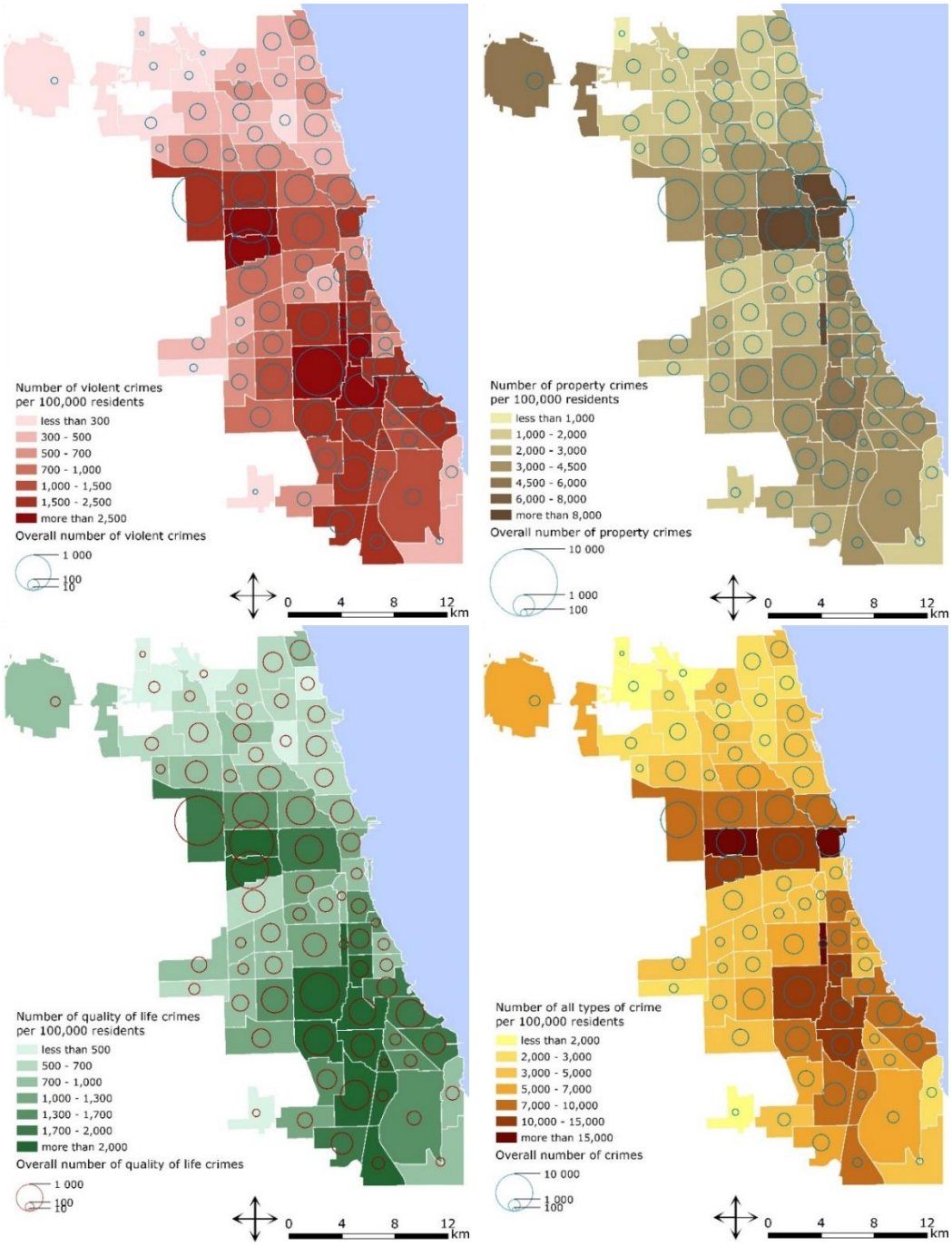

Figure 3. Various crime rates by the community areas of Chicago (left top—violent, right top—property, left bottom—quality of life, right bottom—combined crimes)

4.2. Quality of Schools

Distance to the nearest schools and their quality are important characteristics on realtor websites since education has far-reaching consequences on quality of life for future generations. Some of the best schools in New York are all located in the most expensive TNAs of Brooklyn, and a few are in the more affordable parts of Staten Island and Brooklyn (not shown). The TNAs of Manhattan, the most expensive borough, start to appear in rankings of best schools rather late (i.e., forties and below; out of 188).

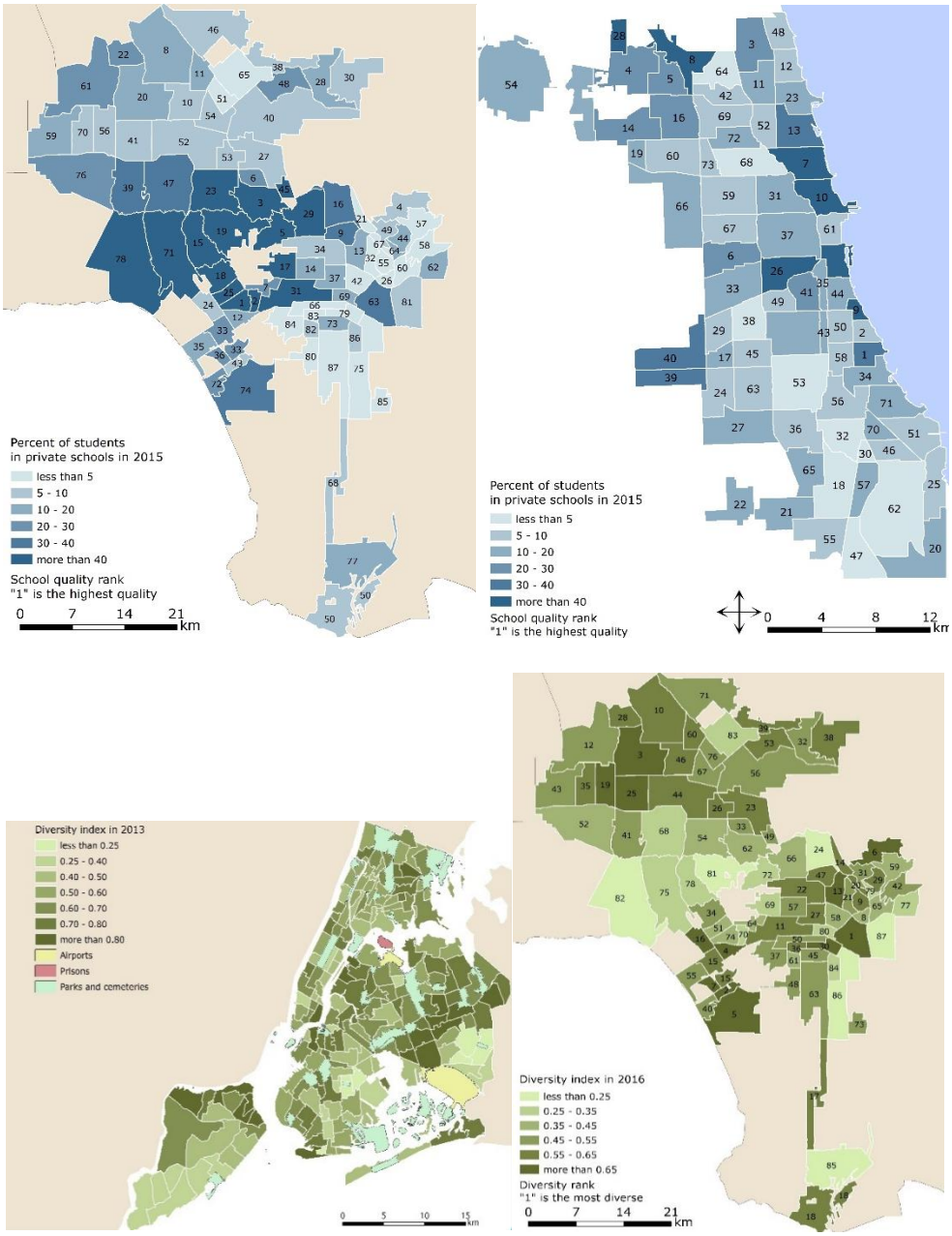

Figure 4. Quality of public schools and percentages in private schools (top left—L.A., top right—Chicago); diversity index (bottom left—New York, bottom right—L.A.)

Predictably, many TNAs with the worst ranking schools are found in the Bronx. This borough comprises the lowest quality schools and the cheapest real estate. NYC-wide coefficients are significant and about –0.5 (Table 2), implying a strong association between school quality and housing values. Further, there are 32 school districts in New York, which also emphasizes the value of a particular place. In compact, dense, and transit-dependent cities such as New York, proximity to certain schools may be crucial for prospective residents.

In neighborhoods with expensive real estate, public schools are among the worst in Los Angeles, whereas schools are ranked medially in the most disadvantaged neighborhoods. The affluent neighborhoods with poorly performing public schools include, for example, Westchester, Playa del Rey, Downtown, Brentwood, and Pacific Palisades. In many well-off neighborhoods, public schools do not necessarily demonstrate good performance since the wealthiest communities are likely sending their children to private schools. However, even a single case of disadvantaged area with good schools was not found in our data. Simultaneously, we also found many mediocre/average-priced neighborhoods with rather good schools. Thus, it seems like the modest performance of public schools in certain cases do not significantly affect real estate prices if there are other stronger factors affecting housing values more.

Table 2. Correlations between school quality and real estate indicators

	Med. sales price	Price per sq. ft	Med. rent	Combined index
New York City				
School Rank	–0.443**	–0.415**	–0.437**	–0.537**
Los Angeles				
School Rank	–0.247*	–0.350**	–0.325**	–0.517**
Private Schools	0.598**	0.573**	0.729**	0.656**
Chicago				
School Rank	–0.256*	–0.271*	–0.254*	–0.446**
Private Schools	0.488**	0.506**	0.433**	0.576**

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Moreover, in Los Angeles, some sort of substitution of poorly performing public schools with private ones is apparent, given the coefficients illustrated in Table 2 and Figure 4 where the highest percentages of students in private schools (40% and higher) often coincide with mediocre public schools. Thus, if there are private schools with significant number of seats in them, the importance of public school quality declines. However, even at the city level, private schools cannot compete with public schools, and in the city of Los Angeles, only 10.1% of total students attend private schools (Statistical Atlas).

In Chicago, the presence of quality schools in lower-valued disadvantaged areas is impossible, even though the opposite situation (i.e., mediocre schools in affluent community areas) is more common there. Thus, as indicated in the correlations analysis, higher school quality in a neighborhood associates with more expensive real estate. This trend holds true across the three cities analyzed in this study. Moreover,

high-quality public schools are not located in communities with the cheapest housing, whereas mid-level public schools are complemented by private schools in affluent neighborhoods.

4.3. Racial/ethnic Diversity

Racial/ethnic residential diversity and segregation are integral characteristics of large American cities. However, despite higher segregation, New York also has a large number of intermixed neighborhoods (Rath 2007). As noted (Table 3), there is no apparent association between real estate values and diversity indicators due to higher intermixing in numerous neighborhoods, especially in multi-ethnic settings found in New York. In different boroughs of New York, diversity plays different roles when it comes to the differentiation of real estate prices. There exists spatial irregularity among TNAs by diversity as some peripheral TNAs toward south of Staten Island, east of Queens, and central Brooklyn have lower diversity (Figure 4), whereas hotspots of higher diversity are visible in north Staten Island, the rest of Queens, and in eastern Bronx.

In Los Angeles, the most racially homogeneous neighborhoods exist at the extremes—in the most expensive communities on the hills as well as in the disadvantaged ones surrounding the CBD. A negative relationship between real estate and diversity is driven by the overbalance in favor of prosperous neighborhoods that are located in and around the Santa Monica Mountains. As such, in Los Angeles, racial/ethnic diversity shows an unexpected, negative relationship with property values.

Table 3. Correlations between racial/ethnic diversity and real estate indicators

	Med. sales price	Price per sq. ft	Med. rent	Combined index
New York City				
Diversity Index	–0.008	0.002	0.016	0.086
Los Angeles				
Diversity Index	–0.345**	–0.171	–0.332**	–0.051
Diversity Rank+	0.185	0.042	0.258*	0.117
Chicago				
Diversity Rank	–0.422**	–0.449**	–0.401**	–0.555**

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

+ Positives with "Diversity Rank" (Los Angeles) indicate a depreciating effect of diversity on real estate, negatives (Chicago) indicate the opposite.

In Chicago, lower housing values are common in less diverse areas (Table 3). This could be because racial/ethnic homogeneity in Chicago is not necessarily associated with white or Asian communities, but with African American and Hispanic communities. Thus, it is important to understand the specifics of Chicago-style homogeneity which is caused by the concentration of African Americans and Hispanics. Chicago's South Side and some community areas west of the CBD are more than 90% African American (Paral 2012). In addition, a majority of homogeneous community

areas are largely Black. Fischer and Joseph's (2008) analysis revealed that the most diverse areas of Chicago were in the northeast (also the most expensive; Figure 1), as well as in the west and southwest of the CBD. The remaining north (white middle class areas) and the south (African American areas with high deprivation) were not diverse. A typology of Chicago's community areas by socio-economic change (Center 2014) posits that middle class and gentrified community areas are the most diverse, whereas both upper class and disadvantaged community areas are the most homogeneous. In New York, however, the role of diversity is unclear, whereas Los Angeles illustrates a negative association between diversity and real estate values.

4.4. Built Environment Characteristics

In New York, higher population density coincides with upscale real estate (Table 4). At the same time, in TNAs with higher vacancy rate, housing is also more expensive. The most high-priced real estate is located in densely populated TNAs of Manhattan, and south of the northern border of Central Park. While moving away from the island, property values drop sharply. As is typical of urban models with an affordable urban core and rich suburbs, the case of New York is quite different wherein the most expensive places are located in Manhattan's CBDs (Midtown and Downtown) and their surroundings, and not in the suburbs or relatively remote TNAs of other New York's boroughs. Suburban living is more of an affordable alternative rather that a privilege or wealth indicator in New York. The most illustrative example in New York is suburban-like Staten Island, which is comparable to the much denser Bronx with regard to property values.

Interestingly, larger supply of residential properties does not alleviate the affordability problem in Manhattan. This borough has the largest concentration of vacant housing (Figure 5), exemplified by Midtown and its surroundings. Due to extremely high real estate prices in Manhattan, it is likely that people with high incomes also may not afford housing there. In the Bronx, higher population density is associated with lower real estate values and this borough is also home to many housing projects (Dastrup et al. 2015). High-vacancy TNAs of the Bronx demonstrate relatively higher housing values. Most likely, residents of this borough cannot afford housing in better areas, and those with an ability to acquire real estate may not consider the Bronx as a good option due to its negative reputation. Staten Island is distinguished by the opposite situation in terms of built environment compared to the whole city. Said differently, lower population density and lower vacancy rates are typical for this borough, whereas a relatively disadvantaged northern part of Staten Island is characterized by slightly higher density and vacancy. In Los Angeles, vacant housing associates with real estate similarly as that in New York (positively and significantly), though the association changes with population density, further highlighting and differentiating the urban ecological nuances between the two. Los Angeles, a typical post-modern American city has a majority of its housing stock comprising of single-

family homes (Figure 6)[6], with 80-85% of its municipal land built-up with such housing stock (Bestor 2015); in contrast, New York symbolizes a classic example of a modern city where apartments and high-rise buildings in Manhattan comprise the most expensive housing.

Table 4. Correlations between built environment and real estate

	Med. sales price	Price per sq. ft	Med. rent	Combined index
New York City				
Population Density	0.327**	0.469**	0.309**	0.268**
Vacancy Rate	0.432**	0.483**	0.415**	0.295**
Los Angeles				
Population Density	–0.301**	–0.208	–0.359**	–0.258**
Vacancy Rate	0.298**	0.242*	0.194	0.132
Chicago				
Population Density	0.424**	0.558**	0.429**	0.523**
Vacancy Rate	–0.454**	–0.402**	–0.298**	–0.512**

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Chicago, however, differs from these two cities in many ways (Table 4). Population density strongly and positively associates with real estate values, coinciding with that of New York, but far more pronounced since the community areas with expensive housing also tend to be densely populated. Higher vacancy rates associate negatively with real estate values, which is exactly the opposite of that in Los Angeles and especially New York where higher vacancy rates are found in very expensive locations. The coastal community areas north of Chicago's CBD are distinguished by the highest population density (Figure 6) due to residential high-rises along Lake Michigan. At the same time, northern inland community areas also have higher population density, drawing a clear divide between the dense north and sparse south. A closer look at the satellite imageries further differentiate Chicago from Los Angeles and New York's built environment, with numerous built-up blocks that underwent demolition and clearance (urban prairies). Such blocks are particularly visible in the community areas of Chicago's Southside and Westside. These cleared blocks serve as an important characteristic of large cities in the Rust Belt. At the same time, this phenomenon does not occur either in New York or in Los Angeles. Housing in some parts of Chicago is no longer attractive, making it quite problematic to sell. Hence, these areas show stagnation, dilapidated housing stock, and depopulation—negative dynamics also tracked by Hinz (2016) who suggested that when the unoccupied housing stock remains unattractive for purchase and housing filtering does not occur, it gets demolished, thence lowering population density of a community area. Consequently, Chicago's community areas with large population exodus, higher vacancy rates, and sparse population also have the lowest property values. In New York, higher vacancy rates are typically associated with high-

[6] Single-family homes with land plots cause lower population density as compared to apartment living, and this is especially noticeable in expensive neighborhoods in the Santa Monica Mountains (Figure 6).

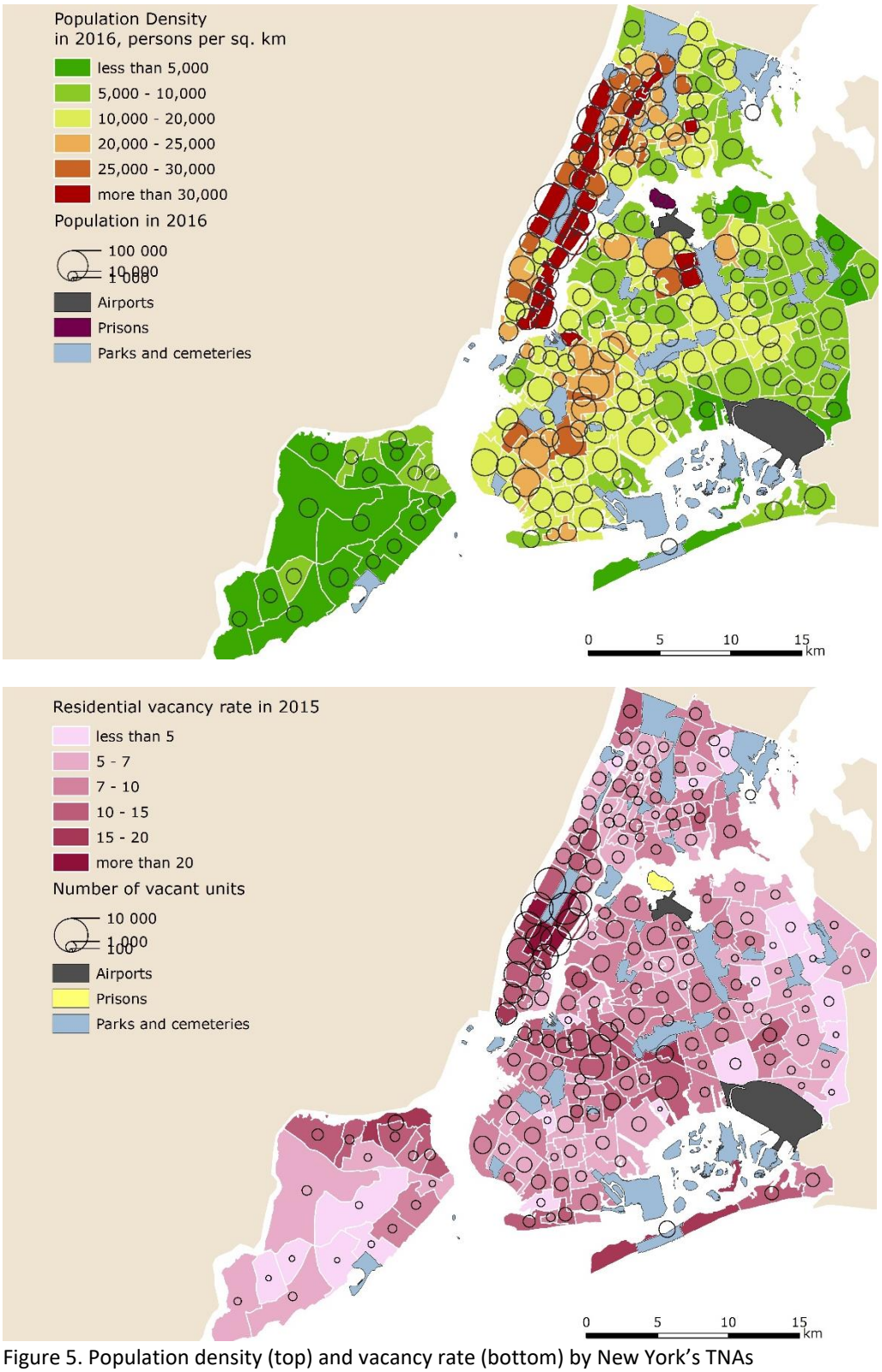

Figure 5. Population density (top) and vacancy rate (bottom) by New York's TNAs

end properties—exactly the opposite of Chicago. Thus, it is reasonable to conclude that in New York, the areas with the cheapest housing are the most populated as it concerns with low affordability and that the local context of each city's built environment can affect its real estate values in various ways.

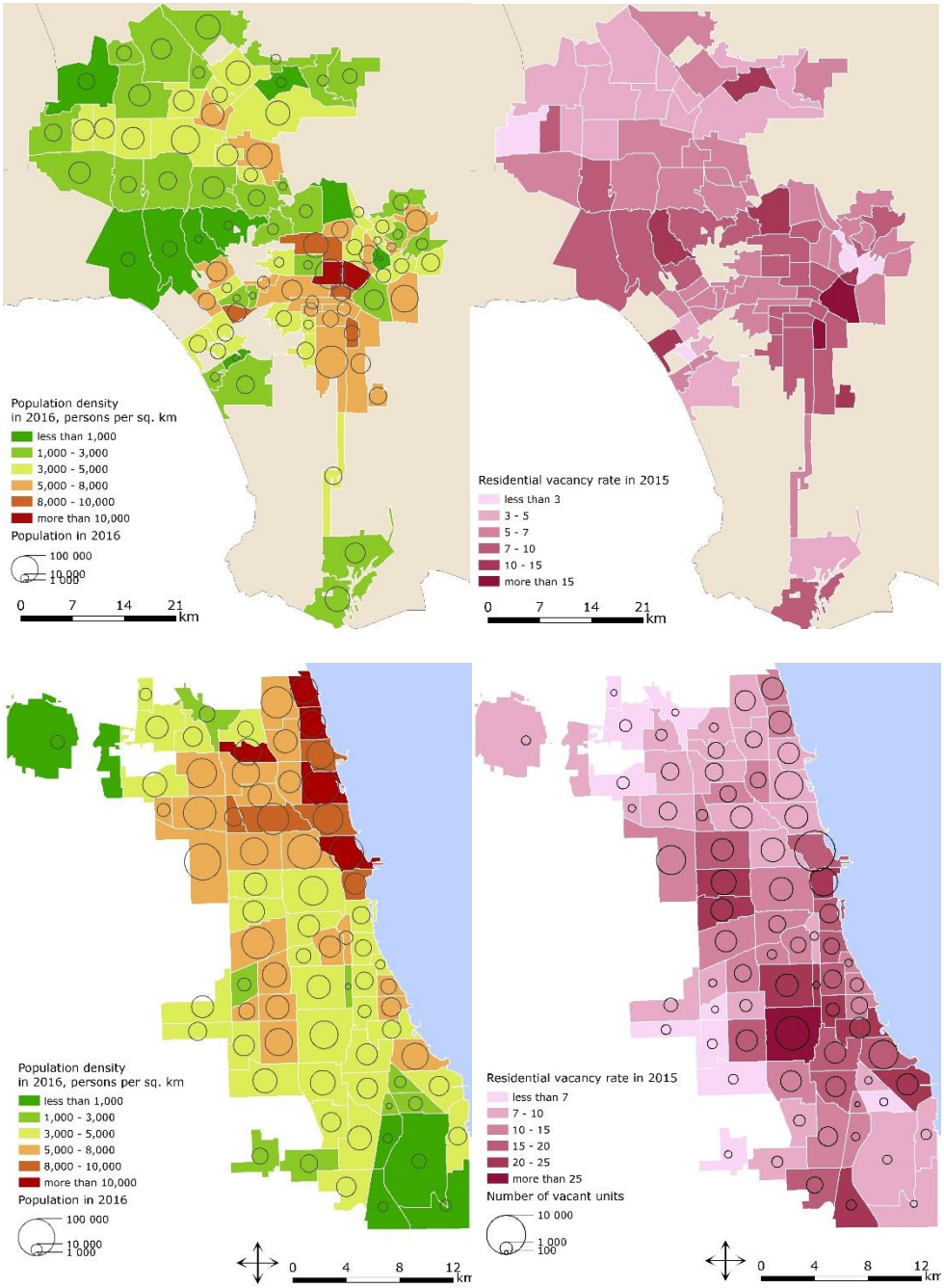

Figure 6. Population density and vacancy rate in Los Angeles (top) and Chicago (bottom)

4.5. Multiple Regression Analyses

Table 5 illustrates multiple regression models for the three cities, each using the limited available list of independent variables at our chosen scale.

Table 5. Multiple regression models for the three cities

New York		
	Standard. Coefficients	p-values
(Constant)	18.852	0.089
Population Density	0.491	0.000
Vacancy Rate	0.122	0.054
Diversity Index	–0.007	0.902
School Rank	0.435	0.000
Homicide Rate	–0.286	0.000
R squared	0.514	

Los Angeles		
	Standard. Coefficients	p-values
(Constant)	40.734	0.001
Population Density	0.115	0.368
Vacancy Rate	0.318	0.002
Diversity Index	–0.063	0.527
Private Schools	0.160	0.214
School Rank	0.294	0.014
Violent Crime	–0.353	0.024
Property Crime	0.142	0.187
R squared	0.433	

Chicago		
	Standard. Coefficients	p-values
(Constant)	36.787	0.000
Population Density	0.304	0.000
Vacancy Rate	–0.010	0.848
Diversity Rank*	–0.099	0.120
Private Schools	0.219	0.005
School Rank	0.091	0.180
Violent Crime	–0.512	0.003
Property Crime	0.456	0.000
Quality of Life Crime	–0.439	0.024
R squared	0.839	

* "Diversity Rank" represents a negative relationship of racial *homogeneity* with real estate
Bold variables have p-value < 0.05

These regression models[7] serve as additional/auxiliary tools to corroborate our findings from the correlations and visual analyses of the maps. The dependent variable is the

[7] The linear regression assumptions have been checked for all three models.

combined price index, whereas the independent variables varied for each city based on data availability at our chosen scale of analysis. As such, these regression models are not to be compared with each other; instead each city should be understood as a case study in terms of broader overview of real estate predictors. As obvious, the regression models mostly confirm our findings from the correlations and mapping analyses where the response (dependent) variable in each model is a combined price index consisting of the three price indicators (i.e., median sales price, price of 1 sq. ft., and median rent). When analyzing the supplementary results obtained from these regression models, we paid attention to the p-values, but were more interested in the direction and nature of these relationships (i.e., positive or negative). While the models cannot be strictly compared, it is worth noting that in each model, violent crime-types emerge as a statistically significant and negative predictor of real estate values, whereas other significant variables typically demonstrate the three city distinctions as discussed in the above subsections. Moreover, in New York, the strongest statistically significant coefficients are attributed to population density and the quality of public schools (both being positive). In Los Angeles, the latter is also important for explaining differences in real estate prices. This city demonstrates quite an unexpected trend, with vacancy rate being statistically significant even though this variable did not turn out significant in the correlation analysis.

Finally, Chicago illustrates a clear negative role of the two types of crime (violent and quality of life) and low racial/ethnic diversity. The variables with positive association with real estate prices include population density, followed by the percentage of students in private schools, and the quality of public schools. Higher property crime rate (positive and statistically significant) is obviously not a cause for more expensive real estate, but a consequence, and therefore it is impossible to claim that it is attractive to potential buyers or renters.

Table 6. A summary for real estate determinants in the three cities

	New York	Los Angeles	Chicago
Crime			
Violent Crime	–	–	–
Property Crime		±	+
School Quality			
School Rank	+	+	+
% in Private Schools		+	+
Racial/ethnic Diversity			
Diversity Index	±	–	
Diversity Rank		–	+
Built Environment			
Population Density	+	–	+
Vacancy Rate	+	+	–

Finally, based on the maps, correlations, and multiple regressions, Table 6 shows that crime in most cases has a negative impact, with property crime being the outlier. School quality has similar and positive degrees of association with real estate in all

three cities, whereas the other two determinants (racial/ethnic diversity and built environment) demonstrate different relationships depending on a city.

4.6. Spatial Splitting of New York

Given the uniqueness of each of the three cities at our chosen scale of analysis, during the manual data collection for New York, we found that the TNAs (table 7) of different boroughs showed significant inconsistencies regarding the proportions of property values and crime. There were many TNAs with noticeably higher homicide rates despite more expensive housing (e.g., Brooklyn, northern Manhattan) compared to other safer areas. Thus, New York is very diverse in terms of its real estate determinants distinguishing it from other two cities. New York has included five counties/boroughs since 1898, and each of them has its own local government, besides the central government of New York. As such, we further divided our data by boroughs for correlations analyses. After splitting, the coefficients became more revealing, and the relationships became more pronounced (Table 7), since the contrasting parts of the city ceased to distort each other.

Queens and Staten Island show a strong negative association between crime and real estate. This could be because these boroughs are almost suburbs, comprising mostly of single-family homes, differing significantly from the typical image of New York. They have lower population density and a strong sensitivity toward crime. Splitting by boroughs further revealed an unexpected pattern regarding diversity, with negative association in Manhattan and Staten Island where more diverse TNAs associated with lower-priced real estate. Also, these two boroughs comprise largely of white alone population (62.6% in Staten Island and 47.1% in Manhattan) (Census FactFinder). However, they are also the most contrasting parts of the city concerning built environment and real estate values. Moreover, vacancy rate in Manhattan does not imply similar meaning as in Staten Island, where it is mostly due to unattractive housing stock located in not the best neighborhoods, whereas in Manhattan, high vacancy may be due to extremely high prices.

5. CONCLUSIONS AND IMPLICATIONS

This study focused on the real estate determinants at an intra-urban level, using the socially and politically recognized units as the scale of analysis in the three largest cities of the U.S. that represent three distinct regional settings in terms of urban ecology, historical evolution, and socio-economic and urban growth dynamism. A detailed and multi-layered in-depth analysis of these three case studies suggest varying roles and nature of relationships of select variables with real estate values, making it difficult to establish a universal hierarchy of determinants. A clear trend, though, is the widespread negative association of real estate prices with higher crime rates across all three cities, and a positive relationship between quality of public schools and real estate values.

Table 7. Correlations with select indicators split by boroughs of New York

	Median sales price	Price per sq. ft	Median rent
Manhattan			
Vacancy Rate	0.361	0.457*	0.288
Diversity Index	–0.287	–0.223	–0.085
School Rank	–0.682**	–0.866**	–0.697**
Homicide Rate	–0.417*	–0.452*	–0.273
Crime Rank	0.036	0.072	–0.152
Bronx			
Vacancy Rate	0.405*	0.291	0.137
Diversity Index	0.197	0.230	–0.002
School Rank	–0.218	–0.343	–0.019
Homicide Rate	–0.442**	–0.465**	–0.178
Crime Rank	0.283	0.379*	0.189
Staten Island			
Vacancy Rate	–0.392	–0.234	–0.631**
Diversity Index	–0.421	–0.498*	–0.664**
School Rank	–0.475*	–0.387	–0.070
Homicide Rate	–0.415	–0.380	–0.741**
Crime Rank	0.462	0.488*	0.674**
Queens			
Vacancy Rate	–0.249	–0.124	–0.236
Diversity Index	0.252	0.220	0.352**
School Rank	–0.606**	–0.471**	–0.427**
Homicide Rate	–0.594**	–0.463**	–0.359**
Crime Rank	0.596**	0.392**	0.460**
Brooklyn			
Vacancy Rate	0.081	0.016	0.118
Diversity Index	0.259	0.292*	0.263
School Rank	–0.418**	–0.335*	–0.361*
Homicide Rate	–0.289*	–0.336*	–0.331*
Crime Rank	0.006	–0.014	0.092

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Other determinants such as racial/ethnic diversity and built environment characteristics do not demonstrate consistent relationships in all three cities. In particular, racial/ethnic diversity shows the largest inconsistency. This is attributable to the varied nature and meanings of racial/ethnic diversity in the three cities being analyzed here. Even though all three cities are prime gateways for immigrants and diversity, the socio-spatial patterns of diversity and segregation across these cities vary significantly due to their historical ecological evolutions and regional economic dynamism (see Brown and Sharma's (2010) analysis of diversity/segregation and regional economy in the 49 largest metropolises of USA). While New York and Los Angeles typically represent a modern and post-modern urban entity respectively, Chicago carries a lot of historical weight from the pre-industrial and the 1970s post-

industrial restructuring era within the U.S., making its internal dynamics of racial/ethnic mosaics and Black/minority disadvantage far more complicated.

Ambivalence also exists in terms of population density and vacant housing. For example, Manhattan's neighborhoods with very high vacancy rates associated with extremely high-priced unaffordable properties, whereas in Chicago, higher vacancy rates associated with a lack of desirability of real estate in certain areas. Minor change in scale of analysis can affect results, making it critical for scholars to reflect on scale when researching complex geographical questions. The presence of detached and distinct parts within a city may add complexity to its understanding, as illustrated in the above subsection, but it may also mask important patterns. Thus, if there were relatively substantive parts within a city with distinct patterns, then a finer scale of geography would help separate them and provide a better understanding. Due to the multidirectional trends within the territory of large, complex, and segregated cities, an overall picture might provide blurred and masked results. A secondary finding of our analysis is that the central business districts are exceptions due to higher concentration of activities. In all three cities, the CBDs and their surroundings deviated from an expected pattern because real estate values in the CBDs are noticeably higher, despite higher crime rates, racial/ethnic diversity, and lower quality of public schools. We also find that property crimes may gravitate toward more affluent neighborhoods with expensive housing. These crimes may not produce a substantial price-dropping effect typical for other crimes. Consequently, property crimes cannot be used as a reliable determinant and should be not treated in the same way as violent crimes.

Finally, this article's contribution to scholarship is in the usage of unconventional (but more locally-accepted) spatial divisions which helped conduct a detailed analysis of three case studies located in different settings. Moreover, we included the most common neighborhood data available at realtor websites that are searched by prospective buyers/renters (besides mere prices and basic physical characteristics of housing). By utilizing such data, we demonstrated either ubiquitous patterns or dissimilarities depending on the local context. Further research is needed that might focus on major cities of smaller size (e.g., Houston, Phoenix, Philadelphia, etc.) to corroborate results from this study. Additionally, future research might find, collect, and analyze more uniform data in order to make a more precise comparison and infer other intra-urban and/or regional (dis)similarities.

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