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Changing Neighborhood Determinants of Housing Price Trends in Southern California,

1960-2009

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Changing Neighborhood Determinants of Housing Price Trends in Southern California,

1960-2009

Abstract

Research has generally failed to explore whether the effect of neighborhood characteristics on home values has changed over time. We take a long-range view and study decadal changing home values in the southern California region over a 50 year period, from 1960 to 2009. We focus on the effects of racial composition and measures associated with the New Urbanism on changing home values. We find that whereas neighborhoods with more racial/ethnic minorities and racial mixing experienced relative decreases in home values in the earlier decades, this effect has effectively disappeared in the most recent decade and actually became positive for some measures. We also found that certain characteristics associated with the New Urbanism—population density, older homes, a lack of concentration of single family units—show stronger positive effects on home values in the most recent decades.

Keywords: neighborhoods, context, home values, race, New Urbanism

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California, 1960-2009

Home values vary across neighborhoods. This implies that certain neighborhood

characteristics are more desirable than others. However, studies typically focus on the

relationship between neighborhood attributes and home values at one specific point in

time (Chambers 1992; Harris 1999; Kiel and Zabel 1996b; Myers 2004), and thus we

have less knowledge regarding whether these relationships may have changed over a long

period of time. Although there are sociological reasons to expect that certain structural

characteristics of neighborhoods impact relative home values across space, a key question

is whether these effects are invariant across time.

We ask whether the relationship between home values and two key social aspects

of neighborhoods may have changed over the last 50 years. First, although the deep

structural importance of race in the U.S. history is unquestioned, an open question is

whether the impacts of racial composition on home values are invariant over time. On

the one hand, American society is marked by high levels of racial segregation (Iceland

2004; Iceland and Nelson 2008; Massey, Gross, and Shibuya 1994), and racial

composition has a strong effect on neighborhood home values (Chambers 1992; Harris

1999; Kiel and Zabel 1996b; Myers 2004). On the other hand, there is some evidence of

modest decreases in racial segregation recently (Denton 2013; Frey and Farley 1996;

Galster and Cutsinger 2007; Logan 2013; Logan, Stults, and Farley 2004; Vigdor 2013),

and some evidence that attitudes towards racial groups may be changing in recent years

(Bobo, Charles, Krysan, and Simmons 2012; Farley, Steeh, Krysan, Jackson, and Reeves

1994; Ihlanfeldt and Scafidi 2004; McDermott 2011). As a consequence, it is worth assessing whether the effect of the racial composition of a neighborhood on home values may have changed over the last 50 years.

Second, whereas the dominant development pattern in the U.S. since 1945 was suburban development of single-family houses, the rise of New Urbanist thinking among academics and planners suggests possible changing preferences among the general population. The growth in the popularity of New Urbanist principles espousing denser and less sprawling development has been one of the most notable developments in regional planning over the last 20 years or so. But whether these principles actually align with the attitudes of the general population is harder to determine. If such principles are indeed embraced by a large contingent of the population, we would expect this to change the relationship between certain physical characteristics of neighborhoods and home values over time. Little research has assessed whether this is indeed the case.

We assess whether the relationship between these neighborhood racial and physical characteristics and home values have changed over a 50 year period (1960-2009) using data on census tracts in the Southern California region. Given the racial conflict that has occurred at particular points in time, and the large influx of racial/ethnic minorities and immigrants into the region over this time period (Aguilar-San Juan 2009), it is useful to assess how the racial/ethnic composition of neighborhoods impact home values over this long period. And given that the built form of the region is dominated by low density development, single use zoning, and extensive roadways that solely support automobile travel (Baldassare 1986; Baldassare 1992; Baldassare 2000)—making the

region a prime example of urban sprawl and particularly inimical to the principles of New Urbanism—it is useful to assess whether the relationship of these characteristics with home values have changed throughout the decades.

Home values over time

The effects of race/ethnicity on home values

There is much scholarly interest in the question of whether the racial/ethnic composition of a neighborhood impacts home values. Since the mid-20th century countless studies have attempted to test "the widely held view that the entry of [African Americans] into neighborhoods reduces property values" (Bailey 1966). Studies consistently find that whites pay a premium for homes in predominantly white areas relative to black areas (Chambers 1992; Harris 1999). More recent studies have begun also to consider the relationship between Latinos or Asians and market prices. A study using national level data from 1970 through 1990 found that both blacks and Latinos had less housing wealth than whites (Flippen 2001).

However, there is some evidence that the racial gap with whites may be narrowing. One national study found that housing values for all nonwhites relative to whites grew from 1970 to 2000 (Sykes 2003). Research focused at the neighborhood level suggests a significant negative effect of Latino concentration on the change in housing values during the 1980's, but a positive effect for heavily Asian neighborhoods (Phelan and Schneider 1996). This highlights that Asians are typically a more advantaged minority compared to Latinos or African Americans.

Only rarely have studies assessed whether the effect of neighborhood racial composition on home values has changed over time. Keil and Zabel (1996a) focused on these changes in three cities over a 13-year period from 1978 to 1991. Even in this relatively short period of time, they found that the premium for living in all white neighborhoods in both Denver and Philadelphia increased over the years, suggestive of increasing prejudice; on the other hand, premiums for white neighborhoods in Chicago decreased during this period. Given that Chicago was the most ethnically/racially diverse city in the study, this suggests the processes may differ in highly racially and ethnically diverse cities such as Los Angeles.

The fairly consistent negative relationship between minority concentration and home values is further supported in studies regarding mixed race neighborhoods. Given the preferences of many whites for homogeneous neighborhoods, and the fact that racially mixed neighborhoods may reflect locations undergoing transition, racially mixed neighborhoods would likely experience a decline in home values on average. There is evidence that residents, especially whites, prefer relatively homogeneous neighborhoods with only a very small presence of minorities (Bobo and Zubrinsky 1996), and that whites hold negative racial attitudes (Bobo, Charles, Krysan, and Simmons 2012; McDermott 2011) . Furthermore, studies have shown the residents in racially mixed neighborhoods express less neighborhood attachment and satisfaction (Connerly and Marans 1985; Hipp 2009; Hipp 2010; Sampson 1991), implying that such neighborhoods are less desirable. One study found that mixed race neighborhoods with a sizeable

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proportion of white residents experienced greater home value appreciation from 1990 to 2000 than mixed-race neighborhoods without a sizeable white presence (Anacker 2010).

The larger trend of growing multi-ethnic diversity and segregation of residents as neighborhoods change is an important piece of this process. One study of Los Angeles from 1980-2000 found that Asians and Latinos are more likely than blacks to enter white neighborhoods; rather, black entry was more likely into neighborhoods have Latino and Asian as well as white residents (John R. Logan and Charles Zhang 2010). Although this may suggest a pathway to more integrated neighborhoods, the further evidence that white residents were more likely to exit mixed neighborhoods implies their continuing preference for homogenous white neighborhoods.

Despite the evidence of race-based housing differentials from 1970 to 2000, a plausible hypothesis is that the magnitude of such effects may have changed in recent years. First, there is some evidence that general racial attitudes have changed over time. For example, Farley and colleagues (Farley et al. 1994) found in Detroit that whites who said they would remain comfortable in a neighborhood that transitioned from all white to 1/3 black went from 43 percent to 56 percent from 1976 to 1992. Similarly, Ihlanfeldt and Scafidi (2004) cite a Gallup Poll finding that white respondents who would move if a black family moved in next door went from 44 percent to 1 percent from 1958 to 1997. A study using the General Social Survey over time showed a steady change in norms regarding race (Bobo, Charles, Krysan, and Simmons 2012). These survey results suggest that residential preferences are changing; of course, such findings could simply be driven by social desirability bias, so more empirical evidence is necessary.

Second, there is some evidence of modest changes in racial attitudes based on audit studies of discrimination in housing. The Housing Discrimination Study 2000 (Turner, Ross, Galster, and Yinger 2000) noted that, despite the serious barriers in the housing market still experienced by African Americans and Hispanics, during the 1990s the "nation has made progress in combating housing market discrimination, achieving significant reductions for black renters, and for both black and Hispanic homebuyers." The report also found that in Los Angeles, Asians are less disadvantaged than are blacks and Latinos (Turner, Struyk, and Yinger 1991). Thus, the level of discrimination faced by various racial groups differs.

New urbanism and home values

The recent rise in the application of New Urbanism principles suggests that the relationships between some emblematic characteristics of this perspective and home values may have also changed in recent years (Leccese and McCormick 1999). The New Urbanism perspective was crystallized with a meeting of the Congress for the New Urbanism, which was founded in 1993 by a group of architects and planners (Leccese and McCormick 1999). Duany and Plater-Zyberk are important figures in the development of New Urbanism, and they emphasized the importance of mixed development on a walkable scale (Duany, Plater-Zyberk, and Alminana 2003; Duany, Plater-Zyberk, and Speck 2000). The defining goal of New Urbanist design theory is to create neighborhoods and cities that simultaneously foster a "sense of community" while "protecting the natural environment" (Talen 1999; Talen 2013). New Urbanists believe that "neighborhoods should be diverse in use and population; communities should be

designed for the pedestrian and public transit as well as the car; cities and towns should

be shaped by physically defined and universally accessible public spaces and community

institutions; urban places should be framed by architecture and landscape design that

celebrate local history, climate, ecology, and building practice" (Talen 2013).

One primary design element of New Urbanism is high density, mixed use

development (Talen and Routledge 2005). High density development is posited to

facilitate social interaction through increased population density, leading to 'vibrant'

public spaces filled with mixed commercial and residential land uses (Calthorpe 1993;

Calthorpe and Fulton 2001). The Los Angeles metropolitan area has the highest gross

density among all U.S. metropolitan areas and among the most dense suburbs in the

nation, with over "30 percent of Los Angeles's suburbanites liv[ing] at densities of

greater than 10,000 people per square mile, compared with 10 percent of New York's

suburbanites" (Danielsen, Lang, and Fulton 1999). Yet this does not necessarily translate

into the sustainable mixed use communities envisioned by New Urbanism. Density can

come in different forms (Campoli 2012; Campoli and MacLean 2007). For example, a

high-rise building located in an isolated neighborhood that is not linked to other land uses

via transit is highly dense, but fails to adhere to a New Urbanist vision. Indeed, Campoli

and MacLean (2007) provide a number of examples of neighborhoods at similar density

levels and yet varying in the degree to which they achieve various principles of New

Urbanism. Rather, communities with a high density of population *and* a mix of several

land uses, such as "jobs, housing, and food outlets, cross walks, bike racks" (Campoli

2012) are places with destination accessibility, which is a key goal of high density, according to New Urbanism (Bohl 2000).

In contrast, Southern California is more typically characterized as dense sprawl. Numerous municipalities are dominated by single use zoning and single family housing. These typically are not diverse mixed-use neighborhoods that integrate different social classes (Bohl 2000; Ewing 1997; Levine 2006). The most conspicuous feature of southern California is the abundance of single family housing, which arguably perpetuated the dearth of multifamily and affordable dwellings as well as multipurpose spaces in the area (Myers 2001). Nonetheless, the State of California has recently made a concerted effort to incorporate New Urbanist principles with legislation to reduce greenhouse gas emissions. New laws are promoting mixed use development in transit priority areas to encourage pedestrian-friendly, transit-accessible communities (SCAG 2009).

Despite Southern California's typically sprawling development, there are some examples of New Urbanist communities in the area. Two such examples are Playa Vista in west Los Angeles and the Americana at Brand in Glendale. Both developments contain a mix of high end boutiques, condominiums, office buildings, open space, and a network of bike paths and sidewalks. Whereas these developments contain a mix of land uses, they are less successful in creating the mix of social classes theorized by New Urbanism. Playa Vista upholds the New Urbanist tenet of infill development, since the community now in-fills the once-sparsely developed land north of Los Angeles International Airport (Vincent 2013). Playa Vista is an economically revitalized area

enjoying a great deal of economic success and investment due to the recent influx of firms such as Youtube, Microsoft, and Fox Sports.

The economic success of these New Urbanist developments is not surprising, given that developers have perceived an unmet market for alternative developments— defined as anything other than conventional, low density, automobile-oriented suburban development—for some time (Danielsen, Lang, and Fulton 1999; Levine 2006). Levine and Inam (2004) in 2001 found that at least 10 percent of local markets are interested in alternative development.

Despite the professed goal of mixed income levels in New Urbanism communities, the affluence that often characterizes them suggests that 'marginalized' groups of society are not prevalent. Thus, some criticize New Urbanism for failing to fulfill goals of social justice (Day 2003; Larsen 2005) and instead accomplishing the opposite by encouraging gentrification and displacement of lower income households (Kennedy and Leonard 2001; Larsen 2005)   For example, local residents resisted a revitalization plan for a low income area in Costa Mesa Orange County to convert a dilapidated shopping center into a mixed space with multifamily housing, public space, and retail , arguing that it would displace existing industry and multifamily housing (Day 2003). In this case, the existing low income residents felt disadvantaged.

Although New Urbanism has undoubtedly captured the attention of many, the question remains whether these principles have permeated the general public's views of desirable neighborhood amenities. That is, have preferences of residents changed over the last 20 to 30 years in line with the rise in this way of thinking? Are developers

correct when they argue that the consumers' preference for New Urbanism development has gone unmet? Given that there was previously such a strong preference for single family homes located in automobile dependent suburban locales that were relatively far from downtowns and jobs, such a shift would represent a profound change in the preferences of households over time. Nonetheless, there is limited empirical evidence whether the proxies for New Urbanism development are more strongly associated with home price appreciation in more recent years.

While direct evidence of design preferences is lacking, there is some recent empirical evidence showing consumers pay premiums to live within New Urbanism communities (Tu and Eppli 1999; Tu and Eppli 2001). However, studies attempting to isolate the effects associated with specific New Urbanism features are mixed (Matthews and Turnbull 2007; Song and Knaap 2003). Cao and Corey (1982) found a preference for mixed use development in Tucson, AZ census tracts. Whereas Song and Knapp (2003) found that neighborhoods with an even distribution of various land uses (such as multi-family, commercial, industrial and public spaces) were more highly valued, they also found a negative association with population density, which is inconsistent with New Urbanist principles. Research in Seattle did find that measures of street connectivity were associated with higher home values in pedestrian oriented neighborhoods (Matthews and Turnbull 2007).

If indeed the principles of New Urbanism are generally desirable to residents, we might expect to observe certain patterns over time. First, given that areas with mixed use housing are more desirable, we would likely observe that neighborhoods with greater

percentages of single family housing units (and thus less mixed use) will exhibit lower

home value appreciation in more recent periods (Cao and Cory 1982; Song and Knaap

2003). Second, we should see that areas with higher population density experience

greater home value appreciation more recently (Myers and Gearin 2001). Third, a key

feature of New Urbanism is the revitalization of abandoned urban centers with older

housing stock. As a result, areas with older homes would presumably become more

desirable, implying that the effect of the age of the housing stock on how home values

change over time would be different now compared to earlier eras. Indeed, whereas

earlier research suggests that the age of housing stock is associated with home

devaluation, age may be a proxy for the structural condition of a home (Franklin and

Waddell 2003; Oates 1969), Li and Brown (1980) in Boston and Goodman and

Thibodeau (1995) in Dallas found a positive coefficient for the quadratic housing age

variable, implying that consumers are willing to pay a premium for homes with a historic

quality. Finally, given the push to co-locate housing and jobs, it is possible that the effect

of commute times on home values has likely changed over time. To the extent that

residents prefer living closer to work, we would expect that commute time would now

have a stronger negative effect on home values compared to earlier eras (Ball 1973;

Franklin and Waddell 2003; Srour, Kockelman, and Dunn 2002).

Setting of study

Southern California is an ideal locale to study the relationship between

racial/ethnic composition and home values is not only its history of immigration, but also

its history of racial violence and racial conflict. From the Watts riots of the 1960s to the

Rodney King riots of 1992, the area has long experienced simmering race relations and high segregation between blacks and whites (McConville and Ong 2003). All-white, low density housing tracts have drastically declined in number throughout the area since the 1990s, especially in the central core area (Holloway, Wright, and Ellis 2012). It is possible that this large structural change in the population composition of the region might change the relationship between neighborhood racial composition and home values.

The period has also seen punctuated changes in immigration law, including the immigration reform of 1965, the Immigrant Reform and Control Act of 1986, the Immigration Act of 1990, and California's Proposition 187 in 1994 attempting to deny schooling and medical care to illegal immigrants. Given the recent large increase in the Latino population as a share of the overall population in the region, and the simultaneous relative stagnation of the black population in the region, what has been the effect these macro changes on home values in the region? If there has indeed been a decline in the acrimonious race relations in Southern California, it should be reflected in home values.

Given that Southern California is notable for its sprawling development, it is also an appropriate site to study the rise of New Urbanism over time. The cost of housing is high in the region: housing was 19% higher than the rest of the U.S. in 1970, 72% higher in 1980, peaked at 130% higher in 1990 before the 1990s housing bust, remained 80% higher in 2000, and increased to 117% higher in 2007 (measured as the average tract housing value). The region exemplifies the quintessential "car culture," as development since the 1920s is one of sprawling suburbs reaching ever further away from downtown

Los Angeles (Bottles 1987; Fogelson 1967). The region has continued to build one freeway after another to address these commuting needs. We therefore assess whether proxies for some of the principles of New Urbanism are more strongly associated with higher home values in recent years.

Data and Methods

Data

This study uses data aggregated to census tracts for the Southern California region over the period from 1960 to 2009. We define the Southern California region to constitute six counties: Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura counties. We obtained data from the U.S. Census for 1960, 1970, 1980, 1990, 2000 and 2005-09. The data for the latter time-point come from the American Community Survey five-year aggregation. The data are placed into constant tract boundaries over time: we reconciled all data to 2000 tract boundaries based on the proportion of population, and using the appropriate Census tract relationship files.

Dependent Variables

The dependent variable for these analyses was the change in the logged median self-reported home value in a census tract over a decade from the U.S. Census. We logged the median home value at the beginning and end of the decade in question, and computed the difference. These values are based on self-reports; although respondents consistently tend to overestimate the value of their home, there is very little evidence that this overvaluation is systematically related to particular characteristics of the

neighborhood (Goodman Jr and Ittner 1992; Kiel and Zabel 1999).[1] Thus, we suggest that these self-reported home values can operate as relatively reasonable proxies of neighborhood home values. Furthermore, our modeling strategy controlled for the perceived home value at the previous time point, so our models are capturing change within a neighborhood (and therefore approximately canceling out differences across neighborhoods in the size and quality of the housing).

Independent variables

We constructed several measures that act as proxies for the principles of New Urbanist development. First, we include a proxy for the mixed use in an area with the *percent single family housing units*. Neighborhoods with high values on this measure have relatively little mixed use, whereas lower values have a mix of housing types.[2] Given that older housing may have "better bones" and therefore be more desirable, we constructed measures of the *average age of housing units* in the tract (the Census reports age of unit in ranges of years; we therefore assigned unit age to the mid-point of this range), as well as the *quadratic* version of this variable to capture possible nonlinear effects. Given the importance of density for New Urbanist developments, we constructed a measure of *population density* in the neighborhood by dividing the population by the area of the tract. We capture the tendency to locate work near home location with a

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[1] We further assessed this by comparing these reported home values in tracts to data on sales prices in zipcodes in the Southern California region obtained from the Rand Corporation. Despite the fact that we had to apportion the sales price data from zipcodes to tracts (assuming a uniform distribution of prices), which adds additional measurement error, the correlations were still quite high between the sales prices and the reported home values: 0.73 in 2007 and 0.77 in 2000.
[2] Although we would prefer to include a measure of mixed use based on retail, offices, residential, etc, we do not have such measures over this period of time. We therefore are constrained to this single measure capturing the type of housing in the tract.

measure of the *average commute time* in the neighborhood, under the assumption that shorter commute times will be more desirable, especially in more recent years. A limitation of commute time is that it is related to mode of transportation, and therefore not a pure measure of employment access; although we would prefer measures of commute distance, they were not available over the entire study period.

We measure the *racial/ethnic composition* of the neighborhood with three measures. We constructed measures of the *percent African American, percent Latino*, and *percent Asian*. The first two groups often have less access to all neighborhoods, and therefore their presence might have a negative effect on neighborhood home values over time.[3] We also captured general racial/ethnic mixing with a measure of *racial/ethnic heterogeneity* within neighborhoods. We constructed a measure of the Herfindahl index with five racial/ethnic groupings (white, African-American, Latino, Asian, and other races).[4]

We also included other measures that capture the desirability of the neighborhood. We computed a measure of the *percent of households with children*, to test whether the presence of more children in a neighborhood (perhaps implying greater school costs but a good place to raise families) increases its desirability. We computed a measure of *residential stability* as the average length of residence in the neighborhood, under the assumption that such stability reduces social disorganization, increases neighborhood cohesion, (Sampson and Groves 1989; Shaw and McKay 1942) and therefore increases

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[3] We also tested for possible threshold effects in which home values fall particularly sharply when these groups constitute a relatively large proportion of the tract population by estimating polynomials. No such effects were detected.

[4] We estimated ancillary models that included percent foreign born. Our substantive results of interest were unchanged in these models.

the desirability of the neighborhood (and might even be a reflection of the desirability). For much the same reason, vacant units arguably reduce the desirability of a neighborhood, so we constructed a measure of the *percent occupied units* in the tract.

Three other neighborhood amenities/disamenities we wished to account for were quality of schools, crime rate, and nearby toxic sites. However, we did not have measures of these in all years at the census tract level. Two of the measures we only had in the 1990s: the *graduation rate* of the local school district comes from the Common Core of data (U.S. Department of Education 2001), and a measure of toxic waste from emitters in the tract based on the Toxic Release Inventory System was computed based on the pounds of release in the tract weighted by their toxicity based on the Risk Screening Environmental Indicators (United States Environmental Protection Agency 2004). And we only had measures of crime at the city level—neighborhood-level crime data is not available longitudinally—so we computed the logged violent crime rate per 1,000 population in the city from the Uniform Crime Reporting data (United States Department of Justice Federal Bureau of Investigation 2000). Prior evidence suggests that violent crime has a stronger effect on residents' perceptions and mobility behavior than does property crime (Hipp 2011), and therefore it likely has stronger effects on the change in home values as well. We believed that including a city level measure of crime was better than excluding the construct entirely in the absence of a neighborhood-level measure.

To capture the possibility that home values in neighborhoods are also affected by the characteristics of nearby tracts, we computed spatially lagged measures. For these

variables, we constructed a spatial weights matrix (W) in which nearby tracts are linked based on a distance decay function capped at two miles. Thus, the closest neighborhoods have the strongest effect on the focal neighborhood, and tracts more than two miles away from the focal neighborhood have no effect on it. We then multiplied this spatial weights matrix by the values of key variables to create the spatially lagged measures. We thus computed a measure of percent occupied units in tracts within two miles, and the racial/ethnic composition of tracts within two miles (percent African American and percent Latino). We constructed measures of these variables at each time point, as well as differenced variables that capture the change in these constructs over the decade.

The summary statistics for the variables used in the analyses illustrate the changes over time in the region (see on-line Table S1). For example, the average population density of tracts in the region has increased from 4842 persons per square mile in 1960 to almost double that in 2000 (9380 per square mile). The average age of housing in tracts has more than doubled from 14.6 years in 1960 to 32.7 years in 2000. Nonetheless, the growth in housing has remained strong: whereas 38% of the existing housing stock in 1970 was built during that decade, and these values were 29% and 24% in 1980 and 1990, even currently 15% of the housing units were built in the most recent decade. This represents the ongoing demand for all housing given the large population growth in the region. There are also notable changes in the racial composition, as the average tract has gone from 9.1% Latino in 1960 to 37% in 2000. Likewise, the average racial heterogeneity in tracts has increased dramatically from 19 in 1960 to 47.3 in 2000. This increasing tract-level heterogeneity parallels the decreasing black/white segregation in

the region: the average black/white index of dissimilarity in the counties in the region fell

from above 80 in 1960 and 1970, to 70 in 1980 and to 60 in the most recent decades.

However, Latino/white segregation has inched up during this period.

<<<Table 1 about here>>>

Methods

In order to assess change in home values between 1960 and 2009 and to

determine if the relationship between the demographic and New Urbanist neighborhood

characteristics and home values have changed over time, we estimated a linear regression

model for each decade separately. The model estimates the difference in logged average

home value for census tract k from time points $t-1$ to t, and the covariates include the

logged home value at the previous time point, independent variables at the previous time

point, and the change in these variables between the two time points. This specification

results in five separate models on logged home values in 1) 1970, 2) 1980, 3) 1990, 4)

2000, 5) 2007 (the mid-point of the 2005-09 period). The model is:

(2) $(y_{kt} - y_{kt-1}) = \beta_1 y_{kt-1} + \beta_2 X_{kt-1} + \beta_3 (X_{kt} - X_{kt-1}) + \rho W X_{kt-1} + \varepsilon_{kt}$

where, $(y_{kt} - y_{kt-1})$ is the change in logged average home value in the tract during the

decade. For example, for the earliest decade, this is the change in logged average home

value from 1960 to 1970. y_{kt-1} is the logged average home value in the same tract at the

beginning of the decade (e.g., 1960 for the first model) which has a β_1 effect on the

change in logged home value, X_{kt-1} is a matrix of lagged neighborhood variables

measured at the beginning of the decade (e.g., 1960 for the first decade) and β_2 is a vector

of their effects on the logged home value in the current decade; $(X_{kt} - X_{kt-1})$ is a matrix of

the changes in these neighborhood measures over the decade (e.g., 1960 to 1970) and β_3

is a vector of their effects on the average logged home value. *WX* is a matrix of the

spatially lagged variables in tract *k* at the beginning of the decade (e.g., 1960) and ρ is a

vector of their effects on the outcome variable, and ε_{kt} is an error term with an assumed

normal distribution.[5] We consider the effects of the X_{kt-1} measures to be *long-term*

effects, as they capture the extent to which home values change over the subsequent ten

years due to these measures. And we consider the effects of the $(X_{kt}-X_{kt-1})$ measures to be

short-term effects given that these measures are changing during the same decade that the

outcome measure of home values is changing.

In our analytic strategy, we estimated models for each decade based on equation

2. By estimating models for each decade separately, we can assess the change in these

coefficients over time. We account for missing data by using a full information

maximum likelihood estimator in STATA; for a discussion of how this handles missing

data, see Arbuckle (1996). We note that there was minimal missing data: some spatial

lag measures have missing cases, as some tracts do not having any neighbors within the

buffer (given that the tracts themselves are larger than the buffer size), and the remainder

occurs due to missing crime data for cities that did not report in a particular year. Finally,

to assess the robustness of our models, we estimated ancillary models with city fixed

effects. The results of these models were very similar to those presented in our main

analyses. Although these ancillary models cannot estimate any city-level variables, the

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[5] We computed the Moran's I for the residuals and there was no evidence of spatial autocorrelation as the
values were essentially 0. In fact, the differencing removed spatial autocorrelation, as the outcome
measures had Moran's I values close to 0.

similar results increase confidence that our main models do not have any city-level omitted variables.

Results

The relationship between racial composition and home values

We begin by focusing on whether the effect of the racial/ethnic composition on home values has changed over the period of the study. Although we see some particularly strong effects for the racial/ethnic composition in the earlier decades, we also detect considerable changes in the size of this effect over the period of study. Tracts with higher percentages of African Americans at the beginning of the decade experienced larger relative drops in home values over the subsequent decade during the 1970s and 1980s (models 2 and 3 in Table 1), but no such effect was observed in the two most recent decades (models 4 and 5). And whereas tracts with a higher percentage of Latinos experienced larger relative drops in home values over the subsequent decade than during the earlier decades, in fact, during the 2000s (model 5) they showed a *positive* effect on the subsequent change in home values over the decade. There was modest evidence of a spatial effect from the racial/ethnic composition in tracts within two miles at the beginning of the decade, as a higher percentage African American in tracts within two miles decreased home values only during the 1970s, and nearby Latinos decreased home values only during the 1970s and 1980s.

<<<Table 1 about here>>>

On the other hand, the short term change in racial/ethnic composition (that is, how racial composition changed during the decade) exhibited stronger effects: tracts

experiencing an increase in African Americans or Latinos experienced simultaneous

falling home values during the 1970s, 1980s and 1990s (models 2-4). Notably, this effect

was much smaller in the most recent decade (and not statistically significant for blacks).

On the other hand, there is evidence of a short term spatial effect, as home values

suffered an additional negative impact if the surrounding neighborhoods experienced an

influx of African Americans or Latinos from the 1970s to 2000s.

The effect of racial/ethnic heterogeneity has also shown considerable change over

the study period. Whereas a higher level of racial/ethnic heterogeneity at the beginning

of the decade resulted in lower home values during the 1960s, 1980s and 1990s, the

effect reversed sign in the 2000s and resulted in *higher* home values by the end of the

decade.[6] A similar change is observed for the effect of the short term change in

racial/ethnic heterogeneity during the decade. During the first four decades,

neighborhoods experiencing an increase in racial/ethnic heterogeneity experienced

simultaneous decreases in home values. However, this effect reversed during the most

recent decade of the 2000s, as neighborhoods that saw an increase in racial/ethnic

heterogeneity experienced an *increase* in home values.

The relationship between New Urbanist principles and home values

We next ask whether some features that characterize New Urbanism show a

different effect on the change in home values over the period of the study. Turning first

to the effect of housing stock composition, we see in Table 1 the effect of clustering of

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[6] This does not appear to be white gentrification occurring: the neighborhoods with higher racial/ethnic heterogeneity at the beginning of the decade (one standard deviation above the mean) with the largest increases in home values (more than one standard deviation) actually experienced a 3 percentage point decrease in whites during the decade.

single family units on changing home values is mixed. Such neighborhoods experienced weaker home value appreciation in the 1970s and 1980s, but greater home value appreciation in the 1960s and the two most recent decades. Furthermore, neighborhoods that experience an increase in percent single family housing units during the decade also experience a boost in home values. Given that the outcome measure is log transformed, we can interpret these as percentage changes: a one percent increase in single family housing units during the decade increases home values 1.6% (β=.0162) in the 1960s, but only between 0.3% and 0.7% in the subsequent decades. Thus, the size of this effect has also weakened in more recent decades, and is smallest in the 2000s.

We also see that housing age has strong effects. As units age over the decade, housing values fall in all but the most recent decade. Each additional year increase in the age of housing units reduces home values about 9% in the 1960s, but just 0.5% and 0.7% in the 1980s and 1990s, and not at all in the 2000s. Note that neighborhoods that are falling in average age of housing units are either losing the oldest units to redevelopment or destruction, or else experiencing an influx of new units (otherwise unit age would increase monotonically during the decade). The effect of the age of housing units at the beginning of the decade also has changed over the study period: during the 1960s and 1970s, neighborhoods with older homes at the beginning of the decade experienced a relatively greater decrease in home values. However, during the latter three decades neighborhoods with older homes actually experienced home value *increases* (though the strength of this effect is weakening).

There is some evidence that population density at the beginning of the decade is associated with greater increases in home values over the decade, especially in the two most recent decades. Whereas this effect was nonsignificant or negative in the first three decades of the study, it actually exhibited a small positive effect on the change in home values during the 1990s and 2000s, suggesting a possible change in preferences towards more dense locales.[7] The change in population density over the decade is important, and the pattern of this effect has changed over this time period. During the 1960s, 1970s, and 1990s increasing population density during the decade resulted in simultaneous decreases in home values during the decade. However, this effect reversed into a positive effect in the most recent decade. We also tested an interaction between the percentage single family housing units and the population density in ancillary models to assess whether the two features in combination lead to higher home values. We found little evidence to support this hypothesis, as the interaction terms for these measures at the beginning of the decade, or for their change over the decade, were either nonsignificant or substantively very small when the effects were plotted. We therefore do not find that the *combination* of population density and housing mix has an additional effect on changing home values.

The relationship between commute time and home values is quite mixed: whereas longer commute times were associated with lower home values during the 1990s, they were actually associated with greater *increases* in home values during the 1980s and 2000s. And the contemporaneous change in commute lengths during the

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[7] This also does not appear to be white gentrification occurring: the neighborhoods with high population density at the beginning of the decade (one standard deviation above the mean) with the largest increases in home values (more than one standard deviation) actually experienced a 5 percentage point decrease in whites during the 1990s and a 1 percentage point increase in whites during the 2000s.

decade reduced home values in the 1990s, but was not significant in the other decades. One possible explanation for these findings is that commute time was a stronger disamenity during the 1990s when home values were largely flat during the decade, suggesting that this could have a stronger effect on home choice during this period. In contrast, during decades when home values are appreciating quite a bit, commute time may actually represent more desirable housing options on the fringe of the region. In such cases, some households accept long commutes to obtain more satisfactory housing.

Control variables

Turning to other neighborhood characteristics that might impact desirability, the effect of residential stability has changed over this time period. In the 1960s, there were strong positive effects on home values for neighborhoods with more residential stability at the beginning of the decade or increasing stability during the decade; however, by the 1970s neighborhoods with more residential stability at the beginning of the decade experienced lower home value appreciation. In the 1990s and 2000s, neighborhoods with more residential stability at the beginning of the decade or increasing residential stability during the decade actually experienced relatively decreasing home values.

We see evidence that the presence of vacant units has a somewhat negative effect on home values, as expected, but this effect has also changed over time. In the 1980s and 1990s, whereas neighborhoods with more vacant units experienced relative *increases* in home values, it was neighborhoods *surrounded* by areas with more vacant units that experienced decreases in values. In the 2000s, it was the presence of more vacant units in

the tract itself that resulted in relatively lower home values during the decade. The effects are weaker and mixed for short term change in vacancies.

Sensitivity analyses

Finally, an interesting feature of southern California is the stark distinction between the more affluent coastal areas and the more blue-collar inland locations. We estimated ancillary models that assessed whether the patterns we observed over the study period differed in these two sub-areas. We accomplished this by creating two subsamples: 1) coastal areas (tracts within 20 miles of the beach); 2) inland areas (tracts more than 20 miles from the beach). Although 20 miles is somewhat arbitrary, it seems reasonable to capture the coastal counties (Los Angeles, Orange, San Diego). It also appropriately classifies inland Los Angeles county as part of the inland area.

The results were quite robust across the two subsamples. The effects of the racial composition across the two subsamples were very similar. The only difference was that the positive effect for percent black and percent Latino at the beginning of the decade in the 2000s was only found in the inland tracts (these were nonsignificant in the coastal tracts). The New Urbanism proxies all operated similarly across the two subsamples with the one exception that the negative effect of increasing commuting distance in the 1990s was only present in the inland tracts. This may be due to searching for more affordable housing as values increased during the decade.

Conclusion

This study has focused on the relationship between neighborhood characteristics and home value change over the subsequent decade. We took a very long range view and

studied these processes over a 50 year period in the Southern California region. By taking this long term view, we were able to assess whether these relationships have changed over this period. Our results demonstrated that indeed, the effect of certain characteristics has changed over time. Most notably, we found evidence that the negative effect of racial minorities and racial heterogeneity on home values has weakened and effectively disappeared in the most recent decade in the Southern California region. Furthermore, we found evidence of changing relationships of proxies consistent with the principles of New Urbanism.

A particularly notable finding is that the negative impact of racial/ethnic minorities (measured as percent black or percent Latino) or racial/ethnic heterogeneity on changing home values has weakened over this 50 year period. Whereas there was strong evidence of a negative effect in earlier decades whether measured as the level of minorities in the tract at the beginning of the decade, the change in minorities over the decade, or the increase in minorities in nearby tracts, this has effectively disappeared in the most recent decade. This implies that preferences for living in racially homogeneous neighborhoods are now weaker. The patterns of white flight observed in earlier decades in which whites left neighborhoods as minorities entered and home values fell are not present in more recent decades. Our results suggest that this change also translates into more stability for housing values in mixed-race neighborhoods. As further evidence of possible changes in preferences, whereas we found that in earlier decades, tracts with more racial/ethnic heterogeneity at the beginning of the decade, and those that experienced a larger increase in heterogeneity during the decade, suffered lower home

value appreciation compared to other tracts, this effect has also disappeared in the most recent decade. While this does not mean that race is unimportant, nor that housing markets do not contain discrimination, it does suggest that deeper levels of racial intolerance may be weakening at least somewhat. In fact, in the 2000s, tracts that had more Latinos at the beginning of the decade, more racial/ethnic heterogeneity at the beginning of the decade, or experienced a larger increase in racial/ethnic heterogeneity during the decade, actually experienced a larger *increase* in home values compared to other tracts. This is a striking change that to our knowledge has not been documented in the literature.

A second finding was consistent with the hypothesis that residents' preferences regarding key features of New Urbanism have changed in recent decades. We found that older housing led to greater decreases in home values over the subsequent decade in the 1960s and 1970s, but this effect has reversed since 1980. This is consistent with the notion that older housing can represent more desirable units with better "bones." There was also modest evidence that higher levels of population density are less undesirable in recent years. Whereas increasing population density was associated with lower home values in earlier decades, this flipped to a positive relationship in the most recent decade. Furthermore, in the two most recent decades, neighborhoods with higher population density at the beginning of the decade actually experienced *greater* home value appreciation. Neighborhoods with a greater mix of housing also experienced greater home value appreciation during the most recent decade. Although some have suggested that the combination of mixed housing along with higher population density is a hallmark

of New Urbanism, we did not find that neighborhoods with high levels of mixed housing and population density experienced appreciably higher home value appreciation than other neighborhoods. This is consistent with the idea the preferences may be changing, and is consonant with the arguments of some that younger residents prefer more dense living (Nelson 2013).

One of the principles of New Urbanism emphasizes the desirability of diversity, and we noted the apparent changes in the effect of racial heterogeneity on home values over this study period. Nonetheless, the New Urbanist principles of diversity and compact urban form need not move in concert. This suggests that diversity would only be desirable if it is accompanied by other New Urbanism amenities. In ancillary models, we tested interactions between racial diversity and our proxies for New Urbanism characteristics, and found no statistically significant effects. Thus, although we did not find that diversity only impacts home values when accompanied by these other characteristics, this would be a useful direction for future research to explore.

We acknowledge some limitations of this study. First, we relied on residents' self-reports of the value of their home. Although this is certainly not ideal, there is little evidence that such reports are *systematically* related to key measures that are typically used in analyses. Nonetheless, future studies using sales data would be useful. Second, although we attempted to be exhaustive in including all important neighborhood characteristics that might impact the change in home values, and indeed our study arguably contained many more such measures than most studies, it is nonetheless the case that we could not include all measures that might be of importance. For example, we

lacked a measure of school quality in most decades. Therefore, we tested in the one decade for which we did have it. The fact that it did not change the effect of the other measures in that one decade analysis is encouraging. Nonetheless, the presence of other possible confounding variables is something to keep in mind. Third, the definition of the ethnic category of "Hispanic" has varied over this period, which should be kept in mind when interpreting the results. Nonetheless, the fact that the most dramatic changes in this definition occurred in earlier years, not the more recent ones when the pattern seemed to have changed, provides some reassurance regarding the results. Fourth, we were limited to relatively crude proxies for New Urbanist principles. It would be preferable to assess whether these patterns remain when using more direct measures capturing New Urbanism principles. Fifth, although the study provided novel information on a region that is arguably quite important for studying the effect of racial change or New Urbanism principles on changing home values, we nonetheless cannot necessarily generalize our findings to other regions. The question is whether the high cost of housing in the region that likely deters migration into the region then has consequences for these patterns of home value changes in neighborhoods. Although we have no specific reason to think it would, future research studying these processes in other metropolitan areas will be necessary.

Another challenge is that various economic expansions and contractions have occurred over this period. Normally, time trend studies of market fluctuations control for the business cycle; we accomplished this by estimating separated models by year. Of particular note is the housing bubble of the 2000s: a question is whether prices in some

neighborhoods rose particularly sharply due to speculation. In ancillary analyses using zipcode home sales price data from Rand (described in footnote 1), we found no evidence that sales prices rose more sharply in minority neighborhoods or more impoverished neighborhoods from 2000 to 2006. Thus, given the general rise in housing prices, and the lack of evidence that speculation was more rampant in neighborhoods dominated by racial minorities or high levels of racial mixing, we suspect that the bubble is not a driver of the results in the most recent decade.

We also note that we could not directly capture resident preferences, as home values reflect both supply and demand. Indeed, studies have focused on the important role that the supply can play in changing home values (Glaeser, Gyourko, and Saiz 2008). If changing preferences move ahead of the supply of various types of housing, then we would observe changing values for certain types of housing. Of course, one would expect builders to respond by offering a different mix of housing. Nonetheless, if we presume that the housing supply for New Urbanism type developments is in fact increasing given the prevailing rhetoric among many planners, then increasing prices for this type of housing would suggest that preferences are changing even faster than the supply. The benefit of using changing prices to estimate preferences rather than surveys is that residents in surveys tend to express a preference for their current location. One's neighborhood is often tied up with one's own identity (Nelessen 1993). Furthermore, residents are typically not asked in surveys to consider trade-offs, which are a fundamental feature of housing choice.

Despite these limitations, this study has provided important new insights. We studied a particularly important region---the southern California region---and demonstrated that there have been some important changes over this 50 year period in structural neighborhood characteristics that predict changes in home values. Most importantly, whereas the presence of racial/ethnic minorities and racial/ethnic heterogeneity in neighborhoods previously had strong negative effects on the changes in home values over decades, no such effect was evident in the most recent decade. This is a dramatic change, particularly in a region that has experienced a considerable amount of racial strife. The second key finding was evidence that residents seem to prefer features of New Urbanism in the most recent decades. To observe this effect in a region with a characteristically car-oriented culture is particularly notable. If changing preferences towards New Urbanist principles are evident in this region, then they may be present in other locales as well. These findings highlight the importance of taking a long-range view when attempting to understand how neighborhood home values change over time.

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Tables and Figures

Table 1. Predicting home values by decade from 1970-2007 for census tracts in Southern California

	(1)		(2)		(3)		(4)		(5)	
	1960-1970		1970-1980		1980-1990		1990-2000		2000-2007	
Tract characteristic at beginning of decade										
Logged home values	-0.3492	**	-0.2954	**	-0.4218	**	-0.1686	**	-0.2579	**
	(0.0214)		(0.0132)		(0.0141)		(0.0139)		(0.0088)	
Percent single family housing units	0.0170	**	-0.0062	**	-0.0008	*	0.0043	**	0.0013	**
	(0.0007)		(0.0005)		(0.0004)		(0.0003)		(0.0002)	
Age of housing units	-0.0460	**	0.0569	**	0.0060	**	0.0066	**	0.0028	**
	(0.0026)		(0.0045)		(0.0013)		(0.0008)		(0.0005)	
Age of housing units squared			-0.0006	**						
			(0.0001)							
Percent occupied units	0.0005		0.0024		-0.0029	†	-0.0064	**	0.0043	**
	(0.0023)		(0.0018)		(0.0017)		(0.0015)		(0.0008)	
Percent occupied units in tracts within two miles	0.0049	†	-0.0005		0.0069	**	0.0095	**	0.0009	
	(0.0026)		(0.0019)		(0.0019)		(0.0018)		(0.0009)	
Population density	-0.0053		0.0201	**	-0.0032	**	0.0044	**	0.0026	**
	(0.0038)		(0.0016)		(0.0010)		(0.0008)		(0.0006)	
Toxic waste in pounds (toxicity-weighted)							-0.0018	†		
							(0.0010)			
Percent black	-0.0036	**	-0.0059	**	-0.0068	**	-0.0009		0.0004	
	(0.0012)		(0.0010)		(0.0009)		(0.0010)		(0.0007)	
Percent Latino	-0.0068	**	-0.0040	**	-0.0024	**	-0.0026	**	0.0010	**
	(0.0012)		(0.0008)		(0.0005)		(0.0006)		(0.0004)	

	Model 1	Model 2	Model 3	Model 4	Model 5
Percent Asian			0.0017	-0.0009	0.0001
			(0.0015)	(0.0010)	(0.0006)
Percent black in tracts within two miles	-0.0013	-0.0050 **	0.0000	-0.0013	-0.0011
	(0.0014)	(0.0011)	(0.0011)	(0.0011)	(0.0008)
Percent Latino in tracts within two miles	0.0002	-0.0033 **	-0.0014 *	-0.0008	-0.0004
	(0.0011)	(0.0008)	(0.0006)	(0.0005)	(0.0004)
Percent Asian in tracts within two miles			0.0042 *	0.0006	-0.0002
			(0.0018)	(0.0012)	(0.0007)
Racial/ethnic heterogeneity	-0.0022 **	0.0013 *	-0.0019 **	-0.0030 **	0.0022 **
	(0.0007)	(0.0005)	(0.0004)	(0.0004)	(0.0003)
Percent households with children aged 0 to 18	0.0081 **	0.0070 **	-0.0033 **	0.0013 †	-0.0018 **
	(0.0009)	(0.0008)	(0.0007)	(0.0007)	(0.0005)
Residential stability (average length of residence)	0.1672 **	-0.0747 **	-0.0023	-0.0175 **	-0.0081 **
	(0.0079)	(0.0070)	(0.0043)	(0.0035)	(0.0021)
Graduation rate of local schools				0.0767	
				(0.0615)	
Average commuting time			0.0162 **	-0.0061 **	0.0029 **
			(0.0013)	(0.0012)	(0.0008)
City violent crime rate	0.0101	0.0466 **	0.0313 **	0.0020	-0.0112
	(0.0107)	(0.0117)	(0.0105)	(0.0121)	(0.0072)
Change in tract characteristic					
Percent single family housing units	0.0155 **	0.0041 **	0.0041 **	0.0073 **	0.0028 **
	(0.0006)	(0.0005)	(0.0004)	(0.0004)	(0.0005)
Age of housing units	-0.0879 **	0.0019	-0.0180 **	-0.0074 **	-0.0003
	(0.0052)	(0.0022)	(0.0037)	(0.0013)	(0.0009)
Age of housing units squared	0.0012 **		0.0003 **		
	(0.0001)		(0.0001)		

Changing home values in SoCal

	(1)	(2)	(3)	(4)	(5)
Percent occupied units	-0.0001	0.0054 **	-0.0014	0.0007	-0.0041 **
	(0.0013)	(0.0015)	(0.0015)	(0.0011)	(0.0008)
Percent occupied units in tracts within two miles	0.0018	0.0004	0.0009	0.0028 *	-0.0002
	(0.0012)	(0.0018)	(0.0022)	(0.0013)	(0.0012)
Population density	-0.0100 **	-0.0042 *	0.0007	-0.0088 **	0.0059 *
	(0.0032)	(0.0020)	(0.0015)	(0.0016)	(0.0023)
Toxic waste in pounds (toxicity-weighted)				-0.0008	
				(0.0012)	
Percent black	0.0040 **	-0.0036 **	-0.0039 **	-0.0066 **	-0.0006
	(0.0013)	(0.0011)	(0.0014)	(0.0013)	(0.0011)
Percent Latino	0.0005	-0.0040 **	-0.0024 **	-0.0059 **	-0.0017 **
	(0.0010)	(0.0006)	(0.0008)	(0.0007)	(0.0006)
Percent Asian			0.0036 **	-0.0012	0.0006
			(0.0013)	(0.0012)	(0.0009)
Percent black in tracts within two miles	0.0013	-0.0085 **	-0.0036 †	-0.0198 **	-0.0073 **
	(0.0017)	(0.0016)	(0.0019)	(0.0020)	(0.0022)
Percent Latino in tracts within two miles	-0.0015	-0.0040 **	-0.0026 *	-0.0032 **	-0.0049 **
	(0.0013)	(0.0010)	(0.0011)	(0.0009)	(0.0010)
Percent Asian in tracts within two miles			0.0008	-0.0014	-0.0031 †
			(0.0017)	(0.0016)	(0.0016)
Racial/ethnic heterogeneity	-0.0060 **	-0.0008 *	-0.0032 **	-0.0034 **	0.0023 **
	(0.0007)	(0.0004)	(0.0006)	(0.0006)	(0.0005)
Percent households with children aged 0 to 18	0.0038 **	0.0089 **	-0.0061 **	0.0014 †	-0.0005
	(0.0009)	(0.0008)	(0.0008)	(0.0007)	(0.0004)
Residential stability (average length of residence)	0.1251 **	-0.0042	0.0061	-0.0166 **	-0.0048 *
	(0.0082)	(0.0066)	(0.0047)	(0.0035)	(0.0022)

Changing home values in SoCal

	(1)	(2)	(3)	(4)	(5)
Graduation rate of local schools				-0.1814 *	
				(0.0742)	
Average commuting time			0.0016	-0.0056 **	-0.0003
			(0.0016)	(0.0013)	(0.0009)
City violent crime rate	-0.0393 †	-0.0383 †	-0.1595 **	0.0209	-0.0206
	(0.0227)	(0.0228)	(0.0199)	(0.0236)	(0.0206)
N	3,959	3,959	3,959	3,959	3,959

Note: ** $p < .01$; * $p < .05$; † $p < .1$. *Standard errors in parentheses. Full information maximum likelihood estimation.*