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Racial Disparities in Housing Value Appreciation: Six Metropolitan Areas, 1980-1990

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Abstract

In this paper we investigate the relationship between race and appreciation in the value of owner-occupied homes with tract-level data for six metropolitan areas. Appreciation in the value of one's home is important because it has historically been the primary mechanism for the accumulation of wealth among middle-class Americans. As Oliver and Shapiro (1995) have eloquently argued, racial wealth differentials are a major source of social and economic disadvantage for African-Americans.

With 1980-1990 tract-level data on appreciation in housing value for white and black homeowners, and 1980 tract-level data on housing characteristics, neighborhood quality, and neighborhood racial composition, we attempted to answer several key questions regarding disparate opportunities for the accumulation of wealth through home equity: Are there racial differentials in appreciation rates? Do appreciation rates covary with the racial composition of neighborhoods? Do the effects of neighborhood characteristics on appreciation rates differ between white and black homeowners? Are African-American homeowners differentially located in neighborhoods with low appreciation rates?

We find that white and black homeowners in the same neighborhoods face similar housing markets, but that white and black homeowners live together in only half of the 3035 tracts in our data. This suggests that housing-market segregation is the principal mechanism underlying racial disparities in housing value appreciation rates. This conclusion reinforces that in the prior research literature: racial differentials in opportunities for wealth accumulation are primarily due to segregation in the market for owner-occupied housing.

Racial Disparities in Housing Value Appreciation: Six Metropolitan Areas, 1980-1990

I. Introduction

Oliver and Shapiro (1995) estimate that the current generation of African American homeowners has lost out on \$82 billion in wealth accumulation through homeownership, with lack of appreciation in housing value accounting for 71 percent (\$58.0 billion) of this loss. Since housing value and home appreciation represent the principal portion of the wealth portfolio of the middle and lower classes (Holloway, 1991), it is clear that the housing market does not return the same benefits to African Americans as it does to whites. A priori, there is no reason to expect that the race of a homeowner should affect housing value or appreciation once other factors are controlled, despite racial stereotyping by whites that includes the belief that black presence in a neighborhood lowers property values (Farley et al., 1994). The most plausible cause of this differential then is the fact that African Americans continue to live in racially segregated neighborhoods whose housing market values are substantially below those characteristic of white neighborhoods (Massey and Denton, 1993; Farley et al., 1994; Flippen, 2001). These neighborhoods, shaped in part by past government and real estate practices that actively promoted residential segregation (Massey and Denton, 1993), are maintained by continued white aversion to more than minimal percentages of African Americans in their neighborhood (Farley et al., 1994; Emerson et al., 2001).

Because correlations between percent black and housing value and housing value appreciation are negative (Archer et al., 1996; Harris, 1999), neighborhood racial composition (summarized as percent black) is often used in the definition of neighborhood quality, either as a single variable or in factor scores (Cf. Can and Megbolugbe, 1997; Can 1992a & b; Brooks-Gunn et al., 1997; Chambers, 1992). In reality, however, little is known about the relationship between race and property values embedded within the context of neighborhood racial composition. Are housing values and housing value appreciation the same

for blacks and whites situated within the same residential context? Do these relationships vary across metropolitan areas, in cities with declining or stable residential segregation, with large or small black populations? Harris (1999) argues that our lack of knowledge about these specifics of the relationship between racial composition and property values is a failure to link sociological theory with econometrics.

This paper makes cross-metropolitan area variation in African American and white home value appreciation its explicit focus. We investigate the relationship between neighborhood racial composition, socio-economic status, housing characteristics, and change in neighborhood housing values between 1980 and 1990 in six metropolitan areas, separately for black and white homeowners. The identification of which neighborhood areas experience strong appreciation versus weak appreciation is of particular importance for both wealth accumulation by African Americans and the future of integrated neighborhoods.

II. Prior Research

This research relates to several different interrelated topics of importance in contemporary sociological and demographic research. First, it flows directly from decades of research on residential segregation and the limitations that segregation has imposed on African Americans (Massey and Denton, 1993). Lack of home value appreciation can be thought of as one more in a long list of negative consequences of residential segregation (Oliver and Shapiro, 1995). Second, this research relates to the importance of homeownership, a fundamental part of the American Dream (Doyle, 1992; Hughes and Zimmerman, 1993). Homeownership has always been an important component of the wealth of middle and lower-class Americans (Stegman et al., 1995), though the gap between black and whites in this regard is noteworthy (Long and Caudill, 1992). Third, neighborhoods with higher proportions of homeowners are more stable (Rohe and Stegman, 1994) and children raised in owned homes have fewer problems (Green and White, 1997). The value of the home includes other spatially linked characteristics such as

school quality (Martinez-Vazquez et al., 1997) and municipal services, what is commonly thought of as the “geography of opportunity” (Galster and Killen, 1995). Taken together, these research themes all speak to the importance of dismantling the segregated system of housing present in most urban areas.

Research on housing segregation has a long history in sociology and demography. This literature has concluded that the residential segregation of African Americans has been and continues to be higher than that of any other group in U.S. cities (Cf. Massey and Denton, 1993). Though African Americans remain hypersegregated in many large metro areas with large black populations (Denton, 1994), researchers have shown that residential segregation has declined, albeit often slightly, in many metro areas (Farley and Frey, 1994), particularly multi-ethnic high immigration ones (Frey and Farley, 1996). The largest declines were in places where segregation was lower to start with and which have smaller black populations (Massey and Denton, 1993; Farley and Frey, 1994). These modest changes in segregation have been accompanied by significant declines in the number of all-white neighborhoods located in both suburbs and cities between 1970 and 1990 (Denton and Massey, 1991; Denton and Alba, 1998, Alba et al., 1995; Denton and Anderson, 1995). Although the pace of neighborhood racial change is not rapid for a large number of neighborhoods over the ten year periods 1970-80 (Denton and Massey, 1991) and 1980-90 (Alba et al., 1995; Denton and Anderson, 1995), by 1990, the vast majority of all neighborhoods, including those in suburbs have at least a few members of non-white racial groups living in them (Denton and Alba, 1998, Ellen, 1998; Nyden et al., 1997, 1998). Early calculations of segregation indices for 2000 by the Mumford Center show that these patterns have not changed (Mumford Center, 2002).

Taken together, these changes in the segregated urban landscape lead us to suspect that much of what is thought to be known about the links between housing value and race may well be outdated or specific to certain configurations of neighborhood characteristics and locations. Historical research has

demonstrated that the declines in value associated with an influx of black neighbors were structured by a combination of real estate guidelines, FHA and other bank mortgage policies in force during the peak years of the black migration from the South (Massey and Denton, 1993; Jackson, 1985; Hirsch, 1983). Real estate guidelines and mortgage policies have changed substantially as a result of the Civil Rights Acts of 1964 and the Fair Housing Acts of 1968 and 1988, plus black migration from the South is essentially over, if not reversing. Furthermore, research on specific cities such as Chicago has shown that factors sometimes associated with neighborhood undesirability (poverty or crime) do not operate in the same way across neighborhoods. As Taub, Taylor and Dunham state “Attitudes toward racial differences, for example, are not distributed the same way everywhere, nor are propensities to invest. Contextual forces intercede, influencing both the distributions and the scales of costs and benefits which individuals use to make their decisions.” (Taub, Taylor and Dunham, 1984:13).

Though significant discrepancies between the economic status of white and black Americans remain, it is equally true that the economic status of the black population has improved during the last half century. Levy (1998:22) shows that compared to 1949, African Americans saw a threefold increase in the proportion with incomes in the top quintile and more than a doubling of their proportions in the 4th quintile, while white Americans only saw increases of one percentage point. So despite the fact just over 20 percent of whites are in each of these quintiles, while only 9 and 13 percent of blacks are in them, the gains imply a much more heterogeneous black income distribution than was true in the past.

Though they still are lower than whites, African American homeownership rates have also improved (Hughes, 1996; Gyourko and Linneman, 1997; Myers and Wolch, 1995), along with education levels and occupational status (Harrison and Bennett, 1995). Research shows that part of the remaining black-white socioeconomic status difference is attributable to wealth differences (Oliver and Shapiro, 1995), which in turn is linked to housing equity (Parcel 1982) and inheritance (Menchik and

Jianakkoplos, 1997). The intergenerational nature of housing equity advantage is threefold: housing equity can pay for childrens' education, used to help them with their first home down payment, and in later life be used to pay college costs for grandchildren, either before or after the grandparent's death (Oliver and Shapiro, 1995).

Despite these reasons to suspect changes in the relationship between home values and racial composition, it is also true that minority home purchasers still confront severe discrimination. In the most recent national study, blacks were likely to be unfavorably treated at some step in the home buying process about half the time on a single visit to a realtor (Yinger, 1995). This is in addition to discrimination by the mortgage (Squires, 1992; Yinger, 1995; Buist et al., 1994; Munnell et al., 1996) and insurance industries (Squires, 1997) and the likelihood of receiving a lower appraisal for a home which in turn affects the insurance and mortgage amounts (Lacour-Little and Green, 1998). Yinger (1997) estimates that discrimination currently costs black and Hispanic homeowners to pay a "tax" of about \$4,000 every time they search for a home to buy. Despite the fact that discrimination was once overt and is now much more subtle, housing discrimination remains a potent force in the distribution of homeowners across neighborhoods (Yinger, 1998).

All these lines of research come together at the neighborhood level and in the return to investment in one's home. While housing economists have long pointed out the relationship between physical characteristics of the structure itself (square footage, number of bathrooms, age, style, condition, etc.) and the home's value, realtors and the American public have also pointed to the effects of 'location, location, location' on a home's value and potential for future increases in value. Neighborhood racial composition has been viewed as such an important determinant of home value that race is often used in the definition of neighborhood quality, either as a single variable or in factor scores (Cf. Can and Megbolugbe, 1997; Can 1992a & b; Brooks-Gunn et al., 1997). As one reviewer noted (Massey, 1998), the correlation of

race and class is the *result* of discrimination and prejudice, and using race as a measure of neighborhood quality only serves to reinforce these segregated patterns. In contrast to prior research that used race as a proxy for neighborhood quality, we estimate the impact of race on the percent change in the value of owner-occupied homes (housing value appreciation) controlling for more valid measures of neighborhood quality.

III. Data and Methods

In the current research, neighborhoods are approximated by census tracts. These are small, non-overlapping geographical units of about 5,000 people (U.S. Bureau of the Census, 1993a). Tracts are the only data source available which meet our criteria: 1) they cover all neighborhoods in a MSA/CMSA; 2) they have race-specific housing values available for all the neighborhoods; and 3) their boundaries can be made comparable across time. The basic data file for this project has already been prepared in the form of census tract files covering the 50 largest MSA/CMSAs in the U.S. for 1970, 1980 and 1990. Tract boundaries have been matched across years,. The final dataset contains data on a total of 108 MSA/PMSAs. All data are taken from the STF4A (or Fourth Count) files. These files contain much more detail on characteristics of racial subgroups than the more commonly used STF3A files, and hence are very appropriate to our research question which focuses on comparing blacks and whites.

Though our longer-term aim is to perform these analyses comparatively for many of the 50 largest MSA/CMSAs in the U.S., for this paper we investigate only six metropolitan areas. The six metro areas, selected for the diversity of neighborhood characteristics, are: Albany, NY, Washington, D.C., Philadelphia, PA, Miami, FL, San Francisco, CA and Houston, TX. Among the salient characteristics of these six areas are a large black middle-class population as well as new immigrants (Washington, D.C.), older housing stock and very high residential segregation (Philadelphia), large Mexican and Hispanic populations as well as newer housing stock (Houston), a large Cuban population (Miami), and a large

proportion of Asians together with significant proportions of Hispanics and Blacks (San Francisco). Albany, NY is included because the researchers' location there enables "ground verification" of particular combinations of neighborhood traits. None of these metro areas is particularly large, an advantage in these preliminary analyses.

Our analyses are aggregate because our research questions specifically refer to geographical aggregates. Does neighborhood quality – as measured by the age and condition of housing units, the prevalence of single- vs. multi-family units, and the social and economic status of residents – have an impact on the average appreciation rate of owner-occupied homes? Net of these measures of neighborhood quality, does the racial composition of neighborhoods affect housing appreciation rates? Are there racial disparities in the effects of neighborhood quality and racial composition on average appreciation rates? Are these effects constant across the metropolitan landscape, or do they vary substantially among metropolitan areas? Finally, are African-American homeowners differentially located in neighborhoods with low average appreciation rates?

Housing value appreciation, the dependent variable in these analyses, is the percent change in the median value of owner occupied housing units between 1980 and 1990. Housing value appreciation is calculated separately for white and black homeowners. White housing value appreciation is the percent change in the median value of white owner-occupied housing units. Likewise, black housing value appreciation is the percent change in the median value of black owner-occupied housing units. The unit of analysis is the neighborhood (census tract), so housing value appreciation and race-specific housing value appreciation are characteristics of neighborhoods, not of individuals. For example, a 10% increase in black housing value in a neighborhood can be the result of an average increase of 10% in the value of black-owned homes, but can also be the result of other processes. These might include the loss by black owners of low-value homes (e.g., urban "renewal") or the acquisition of high-value homes by new black

home-buyers.

Independent variables include percent of the tract population that is black, the median age of housing units, the percent of housing units that are boarded-up, the percent of housing units that are single-family, and two indexes of the socio-economic characteristics of residents. Variables included in these indexes are: the percent of adult residents with at least a high-school education, the percent of adult residents with at least a college education, the percent of employed residents in professional occupations, the logarithm of median household income, the percent of households receiving public assistance, the percent of households below the poverty line, and the percent of unemployed in the civilian labor force. Principal components factor analysis for all tracts, and separately for each MSA, found that these variables always load on the same two factors with approximately the same loadings. The first (“education”) factor has high positive loadings ($>.9$) for the two education variables and a moderate positive loading for percent professional. The second (“poverty”) factor has high positive loadings (between $.8$ and $.9$) for the poverty, unemployment, and public assistance variables, a high negative loading (between $-.7$ and $-.9$) for median household income, and a moderate negative loading for percent professional.

We use 1980 values of the independent variables to predict 1980-1990 housing value appreciation rates. Although change in housing values may be the result of change in neighborhood characteristics (due to migration, renovation, new construction, etc.), measuring both dependent and independent variables as 1980-1990 change produces intractable endogeneity problems. Change in neighborhood characteristics may be the result of change in housing values, as when gentrified neighborhoods attract better-off and better-educated home-buyers, or higher housing prices motivate the renovation of boarded-up units .

IV. Findings

Table 1 presents the distribution of percent change in median housing value across all census tracts in our data, and within each of the six MSAs. Across all 3,035 census tracts, the median neighborhood experienced a 29.1% increase in housing value between 1980 and 1990. In the tract at the 25th percentile, housing appreciated only 2.2%, while at the 75th percentile housing values increased 43.4%. There are clearly racial disparities in this distribution. First, note that of the 3,035 tracts, only 1,693 (55.8%) contained black homeowners, while 2,912 (96%) contained white homeowners. That is, 44.2% of the neighborhoods contained no black homeowners, while 4% contained no white homeowners. This finding is consistent with the large body of research that reports continuing high levels of segregation in metropolitan housing markets (e.g., Massey and Denton, 1993). Among the 2,912 tracts where white homeowners reside, appreciation of white-owned homes in the median tract was 31.4%, while among the 1,693 tracts where blacks own homes, black owned homes appreciated only 13.9%.

Table 1 about here

Both the distribution of appreciation rates and the extent of black exclusion varies considerably across metropolitan areas. The median neighborhood in San Francisco experienced a 53.5% increase in housing value, whereas in Houston the median neighborhood experienced a 35.3% decline. Even at the 75th percentile, median housing prices in Houston suffered a 20.2% decline between 1980 and 1990. Black homeowners are excluded from over half of San Francisco neighborhoods. Among the 43.5% of tracts that contain black homeowners, black owned homes in the median tract appreciated 49.3%, less than white owned homes in the median tract where whites live (53.6%). The most extreme instance of black exclusion in these data is Albany, where less than 1/3 of neighborhoods have black homeowners. It must be noted, however, that Albany's population is less than 5% black, and only 1/4 of black households own homes (data for 1990, not shown). The least black exclusion in these data is Washington, DC, where

only 18% of neighborhoods have no black homeowners. In contrast to Albany, Washington is more than 30% black, and over 40% of black households own homes (data for 1990, not shown).

Racial differences in housing value appreciation may be due to differences in the processes that determine appreciation rates, to segregated housing markets, or some combination of both. We first consider differences in causal processes. Our models consider both the effects of the administrative context of census tracts, and the distribution of neighborhood characteristics among census tracts within MSAs on the distribution of home appreciation rates. To accomplish this, we estimate two-level models for each MSA, separately for white and black homeowners. In these models, level one is census tract, level two is county. Counties are the component building blocks of metropolitan areas and vary in terms of school quality, employment availability, police protection, and other amenities which are linked to housing markets. Our models are:

$$M_0: Y_i = \beta_0 + \epsilon_i, \text{Var}(\epsilon_i) = \sigma^2$$

$$M_1: Y_{ij} = \beta_{0j} + \epsilon_{ij}, \text{Var}(\epsilon_{ij}) = \sigma^2$$

$$M_2: Y_{ij} = \beta_{0j} + \epsilon_{ij}, \text{Var}(\epsilon_{ij}) = \sigma_j^2$$

$$M_3: Y_{ij} = \beta_{0j} + \sum_k \beta_k X_{kij} + \epsilon_{ij}, \text{Var}(\epsilon_{ij}) = \sigma_j^2$$

$$M_4: Y_{ij} = \beta_0 + \sum_k \beta_k X_{kij} + \epsilon_{ij}, \text{Var}(\epsilon_{ij}) = \sigma_j^2$$

where: Y_{ij} is the appreciation rate for census tract i within county j ;

X_{kij} is the value of the k^{th} independent variable for census tract i within county j ($k=1, 2, \dots, 6$);

β_{0j} is the intercept for county j ;

β_k is the effect of k^{th} independent variable on the appreciation rate for tract i ;

ϵ_{ij} is the stochastic term for census tract i within county j ; and

σ_j^2 is the stochastic variance for county j .

M_0 is a simple, intercept-only baseline model, in which appreciation rates are randomly distributed among

neighborhoods within MSAs, with mean $\$_0$ and variance F^2 . Models M_1 and M_2 explore county-level variation within metropolitan areas. M_1 models between-county differences in mean appreciation rates, to which M_2 adds between-county differences in variability.¹

M_3 adds explanatory variables to M_2 . Here, in addition to spatial effects, 1980-1990 appreciation rates are modeled as linear functions of 1980 neighborhood characteristics. Model M_4 removes from M_3 between-county differences in mean appreciation rates. Comparison of M_4 with M_3 assesses the extent to which between-county differences in appreciation rates can be attributed to between-county differences in the distribution of neighborhood characteristics.

Model comparisons are presented in Table 2 (for tracts with white or black homeowners) and Table 3 (for tracts with both white and black homeowners). Results for white homeowners in the top panel of Table 2 indicate that, for all MSAs except Miami (entirely within one county) and Houston, there are significant between-county differences in mean appreciation rates (M_1 vs. M_0); and for all except Miami there are significant between-county differences in the variability of appreciation rates (M_2 vs. M_1).²

Table 2 about here

For all MSAs, one or more of the six independent variables have a significant impact on appreciation rates (M_3 vs. M_2), and these do not account for between-county differences (M_3 vs. M_4). Results are considerably weaker for black homeowners, presented in the bottom panel of Table 2. There is no indication of between-county differences in appreciation rates for black homeowners in Albany, and

¹Several counties in Washington, D.C. consist of only one census tract – these are small independent cities in Virginia. Within-county variances are not defined for these counties, so they are excluded from all analyses.

²Previous analyses of these data found heteroscedasticity to be an important issue (Denton, et al., 2001). Alternative analyses using a different estimation technique (GMM) with a different variance specification (the two tails of the percent black distribution) reach similar conclusions.

minimal evidence in San Francisco (both with high levels of black exclusion – see Table 1). Results for Philadelphia and Washington, D.C. are similar to those for white homeowners, and in Houston there is stronger evidence of county effects for blacks.

Table 3 presents model comparisons for tracts that include both white and black homeowners.

Table 3 about here

Results for black homeowners in Table 3 are virtually identical to those in Table 2 – it is black homeowners, after all, who have been excluded from residential neighborhoods. So, the black neighborhoods in Table 2 are virtually the same as in Table 3 since there are very few all-black neighborhoods, especially compared to the number of all-white neighborhoods. Results for white homeowners in neighborhoods that also include black homeowners appear more similar to those for black homeowners than are results in Table 2. In Albany, for example, between county differences are smaller for whites in Table 3 compared to Table 2 (for blacks, between-county differences are non-significant); and in Houston, between-county differences are significantly non-zero in Table 3, as they are for blacks. This suggests that patterns of racial exclusion may be important for racial differences in the rates at which home values appreciate.

The likelihood-ratio tests of Tables 2 and 3 reject all other models in favor of Model M_3 in all MSAs for whites³, and in all MSAs except Albany, Miami, and San Francisco for blacks. Results for model M_3 (which includes explanatory variables in addition to county effects) are presented in Table 4 (tracts with white or black homeowners) and Table 5 (tracts with both white and black homeowners). These 2-level regression models estimate the effects of neighborhood racial composition (%black), the “poverty” and “education” factors, housing age, housing type (% single family), and housing condition

³In Table 3, the baseline intercept-only model for Miami is not rejected by M_3 at conventional significance levels for whites or blacks.

(% boarded up) on median appreciation rates for white-owned homes (left panel) and black-owned homes (right panel). County-intercepts and county-variances are included in the estimated models but are not shown in the tables.

Results for white homeowners suggest that percent black in 1980 decreased 1980-1990 white appreciation rates in Philadelphia, San Francisco, and Washington, D.C., but had no effect in Albany, Houston, or Miami. The “poverty” factor decreased white appreciation rates in Houston and Washington, D.C., but had the opposite effect in San Francisco (results for the other MSAs are negative, but not significant). The “education” factor increased white appreciation rates in Houston, Philadelphia, and San Francisco, had no effect in the other MSAs (effects are positive, but not significant). Housing age in 1980 increased 1980-1990 appreciation rates in all MSAs, but the percent single family housing decreased appreciation rates in all except Philadelphia (no effect) and San Francisco (significant positive effect).

Table 4 about here

The percent of housing boarded-up in 1980 has no impact on white appreciation rates in any of the six MSAs.

Results for black homeowners are neither as strong nor consistent. Consistent with results for white homeowners, percent black in 1980 reduced 1980-1990 black appreciation rates in Philadelphia and Washington, D.C., but had no significant effect in Albany, Houston, or Miami. The “poverty” factor decreased black appreciation in Philadelphia (where there was no effect for white homeowners) but increased appreciation in Miami (also no effect for white homeowners). The “education” factor reduced appreciation for black homeowners in Miami (the effect for white homeowners was also negative, but not significant), but increased appreciation for black (as for white) homeowners in Philadelphia. Housing age increased appreciation for black homeowners only in Houston and Philadelphia (compared to all MSAs for white homeowners). Percent single-family homes affected appreciation rates for blacks only in

Philadelphia (compared to five of the six MSAs for whites).

White appreciation rates are higher in those tracts with older housing (six of six MSAs) and a lower proportion of single-family housing (five of six MSAs). Black appreciation rates were similarly affected in only two of the six MSAs). In half of the MSAs, white appreciation rates were lower in tracts with a higher proportion black population, while black appreciation rates were similarly affected in only two of the three. Similar patterns of racial differences are evident for the “poverty” and “education” factors, but these effects display both racial and MSA differences in significance and direction. From these results it appears that white and black homeowners face similar market conditions in some MSAs (most notably Philadelphia) but not in others (e.g., Miami, where different variables have significant effects and with different signs). But these findings cannot assess the extent to which white and black homeowners face similar market contingencies because, as often as not, white and black homeowners live in different census tracts.

Table 5, on the other hand, includes only those tracts with both white and black homeowners, so the specific census tracts included are the same for whites and blacks. As with the the model contrasts in Tables 2 and 3, results for black homeowners are very similar to those in Table 4: there are relatively few tracts that include black homeowners but exclude white. Results for white homeowners , however, do change when we include only those tracts that also have black homeowners. Overall, results are now more similar to those for black homeowners, though important differences remain. In Houston, for example, where black homeowners are excluded from almost half of the neighborhoods in which whites own homes (see Table 1), the “poverty” and “education” factors no longer have significant effects on appreciation rates for whites. White and black homeowners now differ only in the impact of single-family housing (negative effect for whites, no effect for blacks). In San Francisco, where black homeowners are excluded from more than half of the neighborhoods in which whites own homes (see Table 1), white and

black homeowners now differ only in the impact of percent black and the “poverty” factor.⁴

Differences in the effects of explanatory variables between white and black homeowners in Table 4 could be due to differences in the neighborhoods in which white and black homeowners reside. Differences in these effects in Table 5 cannot be attributed to segregated owner-occupied housing at the tract level because only tracts that included both white and black homeowners were included in the Table 5 analyses. Although differences may be due to segregation at the sub-tract level, we cannot address this issue with our data. Instead, we take a closer look at the differences we observe in Table 5. Washington D.C. exhibits more racial differences in the effects of explanatory variables than any of the other MSAs: for whites, four of the six coefficients are significantly non-zero, for black homeowners, none are. Yet, all coefficients for blacks have the same sign as those for whites, and most are comparable in magnitude (e.g., for percent black, $b = -1.9$ for whites, vs. -1.3 for blacks; for housing age, $b = +4.17$ for whites, vs. $+2.87$ for blacks). All are within one standard error of each other.⁵ Similar patterns are apparent for the other MSAs in Table 5.

The most consistent finding in Table 5, as in Table 4, is that 1980-1990 appreciation rates are higher in tracts with older housing stock. Percent black, perhaps the most contentious of explanatory variables in models of neighborhood quality, significantly reduces appreciation rates for whites in half of our MSAs; for blacks in only one (Philadelphia). Some of the Table 4 results, most notably the negative effect of single family housing on appreciation rates for whites but not for blacks, appear due to differences in neighborhoods where whites and blacks own homes. Although it is not entirely clear what

⁴We note that the coefficient estimates for these two variables are very similar, it is the standard errors that are markedly different. This is also the case with the effects of housing age and percent single-family in Albany.

⁵We cannot statistically test the equality of coefficients because that would require simultaneous estimation of white and black equations, not possible with the multilevel procedure we use for these analyses. We do know from other analyses that white and black appreciation rates are correlated, so the covariance between coefficients cannot be ignored. Simultaneous estimation with alternative techniques (GMM) found very few significant coefficient differences.

to make of racial differences in the effects of explanatory variables once analyses are restricted to neighborhoods where both whites and blacks own homes, we suspect that the differences we find in Table 5 are more apparent than real: coefficient values are typically comparable in magnitude but standard errors frequently are not (see fn. 4). We know that many neighborhoods with white homeowners have relatively few black homeowners. This has the effect of inflating variances in the black equations relative to the white equations.

Overall, our regression models find between-county differences in both the mean and variance of appreciation rates for both white and black homeowners, and suggest some variation across metropolitan areas in the determinants of housing value appreciation. We find racial disparities in the determinants of appreciation rates across all neighborhoods, and apparent racial disparities in the determinants of appreciation rates in integrated neighborhoods, but regard these latter differences with some suspicion. It is clear, however, that patterns of segregated owner-occupied housing are important for explaining racial disparities in rates of home value appreciation within metropolitan areas. Metropolitan housing markets are severely segregated, black home-owners typically face lower returns on their investment in housing than do whites (Table 1), and racial differences in model fit and parameter estimates narrow when we restrict analyses to neighborhoods in which both whites and blacks own homes (Tables 2-4). Taken together, these findings suggest that black homeowners are differentially allocated to neighborhoods with lower appreciation rates.

Evidence bearing on this conjecture is presented in Table 6. Table 6 presents the mean and median percent of owner-occupied homes owned by blacks at each quartile of housing value appreciation. If blacks were distributed among these neighborhoods in the same proportion as whites, the percent of

Table 6 about here

homes owned by blacks would not vary across quartiles. In Albany, for example, blacks owned 1.63% of

homes in the median census tract in 1980, but are disproportionately located in the top appreciation quartile. Among census tracts in the top quartile of the appreciation distribution, blacks own 5.51% of homes in the median tract⁶. This pattern is apparent – though to a lesser extent – in San Francisco and Houston. In Philadelphia and Washington, in contrast, blacks own over half of the homes in the median tract of the lowest appreciation quartile, but only a few percent of homes in the median tract of the highest quartile. This concentration of black homeownership in neighborhoods where appreciation is low most likely reflects the effect of segregation, as Denton (1994) found that black homeownership rates were slightly higher in hypersegregated metropolitan areas, which include Philadelphia and Washington.

V. Summary and Conclusions

In this paper we investigated the relationship between race and appreciation in the value of owner-occupied homes. Appreciation in the value of one's home is important because it has historically been the primary mechanism for the accumulation of wealth among middle-class Americans. As Oliver and Shapiro (1995) have eloquently argued, racial wealth differentials are a major source of social disadvantage for African-Americans.

With 1980-1990 tract-level data on appreciation in housing value for white and black homeowners, and 1980 tract-level data on housing characteristics, neighborhood quality, and neighborhood racial composition, we attempted to answer several key questions regarding disparate opportunities for the accumulation of wealth through home equity: Are there racial differentials in appreciation rates? Do appreciation rates covary with the racial composition of neighborhoods? Do the effects of neighborhood characteristics on appreciation rates differ between white and black homeowners? Are African-American homeowners differentially located in neighborhoods with low appreciation rates?

⁶The mean is many times the median because the distribution has a very large positive skew. In Albany, for example, blacks own less than 1% of homes in 30% of neighborhoods, but more than 1/4 of the homes in 10%. This pattern is consistent across MSAs.

We found that there are racial disparities in appreciation rates in the six metropolitan areas we studied, but that these disparities are not easily characterized because of the extreme levels of segregation in metropolitan housing markets. Typically, the median appreciation rate among neighborhoods where blacks own homes is lower than in neighborhoods where whites own homes. But on average, blacks do not own homes in over 40% of the neighborhoods in our data. Furthermore, both the extent of segregation and disparities in accumulation rates vary across the MSAs. In Washington, D.C. and Philadelphia, African-American homeowners are overwhelmingly located in neighborhoods with very low appreciation rates, but this is not the case in Albany, Houston, and San Francisco. In these three metropolitan areas, black homeowners tend to be located in neighborhoods with above-average appreciation rates.

In all MSAs except Miami (entirely within Dade County), we found between-county differences in both the mean and the variance of appreciation rates. These between-county differences could not be attributed to between-county differences in neighborhood characteristics. Counties are administrative units, not merely a random clustering of census tracts, so we must look instead to county-level administrative processes and outcomes for an explanation of these differences..

Net of these between-county differences, we found that appreciation rates also covary with neighborhood characteristics. The 1980 neighborhood characteristic that had the most consistent impact across metropolitan areas on 1980-1990 appreciation is the age of the housing stock. Racial and socio-economic composition had an impact in only a minority of MSAs. We found some racial disparities in the effects of neighborhood characteristics on appreciation rates, but these disparities narrowed considerably when analyses were restricted to neighborhoods where both whites and blacks own homes.

Our finding that white and black homeowners appear to face similar housing markets in the same neighborhoods, together with the finding that white and black homeowners live together in only half of the 3035 tracts in our data, suggests that housing-market segregation is the principal mechanism

underlying racial disparities in housing value appreciation rates. This conclusion reinforces that in the prior research literature: racial differentials in opportunities for wealth accumulation are primarily due to segregation in the market for owner-occupied housing.

Our finding of considerable variation among MSAs in the distribution of appreciation rates, the extent of segregation, and the effects of neighborhood quality and racial composition on appreciation rates, suggest that research efforts focus on understanding these differences. Analyses of additional metropolitan areas, and more comprehensive multilevel modeling of MSA and county differences is on our agenda for further research. Of particular importance are the spatial autocorrelation of appreciation rates and covariates among census tracts and the measurement of county-level structures, processes, and outcomes. Spatial autocorrelation affects standard error estimates, and may be one factor underlying apparent racial differences, in the same neighborhoods, of the effects of explanatory variables on appreciation rates. Between-county differences in means and variances are thus far unexplained, but we suspect county level variables, such as crime rates, school quality, and the distribution of employment opportunities and services.

In this paper, we were unable to model the effect of neighborhood change on appreciation rates because of endogeneity concerns. Neighborhood change is clearly an important consideration, and methods for incorporating neighborhood change in our analyses is on our agenda, also.

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Table 1: Housing Value Appreciation Rates, 1980-1990 (Quartiles).

	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>N</u>
Total	2.2%	29.1%	43.4%	3035
W	3.5	31.4	44.9	2912
B	- 7.8	13.9	40.0	1693
Albany	38.5	45.9	51.7	186
W	38.9	46.1	51.8	185
B	22.9	62.6	89.8	59
Houston	-46.3	-35.3	-20.2	544
W	-48.3	-35.8	-19.7	520
B	-57.7	-31.2	-13.2	284
Miami	- 7.7	- 0.5	10.6	217
W	- 8.3	- 1.0	13.2	209
B	-13.6	- 3.8	11.5	119
Philadelphia	23.9	35.9	43.6	1121
W	27.2	36.9	45.0	1088
B	4.7	23.6	42.4	557
San Francisco	41.8	53.5	61.0	310
W	41.2	53.6	60.6	301
B	29.2	49.3	75.2	135
Washington, DC	12.4	25.1	39.3	657
W	14.2	26.9	40.8	609
B	2.4	14.7	36.6	539

Table 2. Model Contrasts: Likelihood-Ratio Test Statistics, All Tracts.

White

	M ₁ vs. M ₀		M ₂ vs. M ₁		M ₃ vs. M ₂		M ₃ vs. M ₄		<u>Counties</u>
	<u>P²</u>	<u>df</u>	<u>P²</u>	<u>df</u>	<u>P²</u>	<u>df</u>	<u>P²</u>	<u>df</u>	
Albany	34.4	4**	49.1	4**	36.8	6**	34.4	4**	5
Houston	6.6	4	29.8	4**	162.2	6**	36.2	4**	5
Miami	0.0	0	0.0	0	19.9	6**	0.0	0	1
Philadelphia	100.1	7**	441.2	7**	136.0	6**	75.7	7**	8
San Francisco	39.5	2**	59.2	2**	68.7	6**	32.4	2**	3
Washington, D.C.	64.9	9**	205.7	9**	72.0	6**	44.1	9**	10 ^a

Black

	M ₁ vs. M ₀		M ₂ vs. M ₁		M ₃ vs. M ₂		M ₃ vs. M ₄		<u>N. of Counties</u>
	<u>P²</u>	<u>df</u>	<u>P²</u>	<u>df</u>	<u>P²</u>	<u>df</u>	<u>P²</u>	<u>df</u>	
Albany	6.9	3	6.6	3	10.2	6	9.0	3*	4
Houston	19.1	4**	18.4	4**	26.3	6**	17.6	4**	5
Miami	0.0	0	0.0	0	12.1	6	0.0	0	1
Philadelphia	29.1	7**	57.8	7**	73.2	6**	29.6	7**	8
San Francisco	6.2	2*	1.6	2	3.8	6	4.3	2	3
Washington, D.C.	34.5	7**	93.4	7**	22.6	6**	22.0	7**	8 ^b

Models:

M₀: Intercept only

M₁: Between-county differences in intercepts

M₂: M₁ + Between county differences in within-county variances

M₃: M₂ + Independent variables

M₄: M₃ - M₁

Notes:

a. Three counties with one tract are excluded

b. Five counties with one tract are excluded

* p<.05

** p<01

Table 3. Model Contrasts: Likelihood-Ratio Test Statistics, Tracts With Both White and Black Home-Owners

White

	M ₁ vs. M ₀		M ₂ vs. M ₁		M ₃ vs. M ₂		M ₃ vs. M ₄		N. of Counties
	P²	df	P²	df	P²	df	P²	df	
Albany	8.7	3*	23.7	3**	41.6	6**	12.5	3**	4
Houston	14.7	4**	11.5	4*	33.1	6**	30.7	4**	5
Miami	0.0	0	0.0	0	7.1	6	0.0	0	1
Philadelphia	40.2	7**	312.5	7**	44.3	6**	59.7	7**	8
San Francisco	24.5	2**	26.3	2**	14.3	6*	12.1	2**	3
Washington, D.C.	53.7	7**	145.0	7**	54.9	6**	38.2	7**	8 ^a

Black

	M ₁ vs. M ₀		M ₂ vs. M ₁		M ₃ vs. M ₂		M ₃ vs. M ₄		N. of Counties
	P²	df	P²	df	P²	df	P²	df	
Albany	6.9	3	6.6	3	10.2	6	9.0	3*	4
Houston	19.1	4**	16.8	4**	25.7	6**	17.4	4**	5
Miami	0.0	0	0.0	0	12.1	6	0.0	0	1
Philadelphia	22.0	7**	59.0	7**	45.0	6**	28.9	7**	8
San Francisco	6.2	2*	1.6	2	3.8	6	4.3	2	3
Washington, D.C.	33.60	7**	96.1	7**	25.2	6**	21.6	7**	8 ^a

Models:

M₀: Intercept only

M₁: Between-county differences in intercepts

M₂: M₁ + Between county differences in within-county variances

M₃: M₂ + Independent variables

M₄: M₃ - M₁

Notes:

a. Five counties with one tract are excluded

* p<.05

** p<.01

**Table 4. Effects of Tract Characteristics on Percent Change in Housing Value, by MSA and Race of Home-Owner.
Maximum Likelihood Estimates, All Tracts.**

	White			Black		
	Estimate	Standard Error	Pr > t	Estimate	Standard Error	Pr > t
Albany						
%Black	2.7643	2.2802	0.2270	-14.9093	8.0680	0.0706
Pov. Factor	-10.5938	17.0957	0.5363	119.90	95.2666	0.2141
Ed. Factor	7.9404	15.0027	0.5973	-102.82	73.0230	0.1654
Housing Age	2.0801	0.8863	0.0200*	4.3922	5.7004	0.4447
%1-Fam.	-2.1264	0.8688	0.0154*	-7.7348	4.0352	0.0611
%boarded	1245.47	642.10	0.0540	1851.08	1389.99	0.1891
Houston						
%Black	-0.3176	0.6113	0.6037	0.8142	1.0870	0.4545
Pov. Factor	-47.7559	20.3982	0.0196*	1.0010	46.4288	0.9828
Ed. Factor	53.0701	14.1069	0.0002*	-8.1282	28.8891	0.7786
Housing Age	12.7497	1.5180	<.0001*	11.2394	3.8184	0.0035*
%1-Fam.	-1.5895	0.6536	0.0154*	1.0377	1.4692	0.4806
%boarded	-444.21	2249.18	0.8435	-2648.77	3727.78	0.4780
Miami						
%Black	-1.6764	1.0680	0.1181	-0.6819	1.1341	0.5489
Pov. Factor	-25.7549	32.4482	0.4283	96.7893	45.7569	0.0366*
Ed. Factor	-66.2398	34.9553	0.0595	90.4519	41.3919	0.0310*
Housing Age	10.5513	3.8517	0.0067*	1.8284	5.0203	0.7164
%1-Fam.	-4.4008	1.1752	0.0002*	0.3891	1.6483	0.8138
%boarded	26.8498	2688.69	0.9920	3317.34	6879.67	0.6306

Note: All models include county-intercepts and county-variances. All coefficients are multiplied by 10.0.

* p<.05 (two-tailed)

Table 4 (Cont). Effects of Tract Characteristics on Percent Change in Housing Value, by MSA and Race of Home-Owner. Maximum Likelihood Estimates, All Tracts.

	White			Black		
	Estimate	Standard Error	Pr > t	Estimate	Standard Error	Pr > t
Philadelphia						
%Black	-1.1981	0.3862	0.0020*	-1.5118	0.6094	0.0134*
Pov. Factor	-19.5627	11.9102	0.1008	-51.6041	23.3975	0.0278*
Ed. Factor	20.6819	5.5060	0.0002*	34.0577	16.9882	0.0455*
Housing Age	2.2541	0.3767	<.0001*	5.5534	1.1650	<.0001*
%1-Fam.	-0.5295	0.2854	0.0639	-1.7775	0.9039	0.0498*
%boarded	-7.8233	383.72	0.9837	-195.36	508.95	0.7012
San Francisco						
%Black	-3.7597	0.7393	<.0001*	-2.2359	3.5004	0.5241
Pov. Factor	90.3509	14.4429	<.0001*	79.4524	95.9163	0.4090
Ed. Factor	24.0459	11.6169	0.0393*	15.0926	76.3551	0.8436
Housing Age	2.6613	0.9094	0.0037*	5.6996	5.2718	0.2817
%1-Fam.	1.0426	0.3962	0.0089*	0.6218	2.7203	0.8196
%boarded	2491.16	1715.43	0.1475	-7668.68	8247.94	0.3543
Washington, DC						
%Black	-2.2441	0.5605	<.0001*	-1.4571	0.7377	0.0488*
Pov. Factor	-40.7352	18.8609	0.0312*	-13.1199	22.9055	0.5670
Ed. Factor	23.0267	12.6865	0.0700	24.7873	19.4313	0.2027
Housing Age	4.0741	0.9501	<.0001*	2.9709	1.5555	0.0567
%1-Fam.	-0.8285	0.3394	0.0149*	-0.7088	0.5678	0.2125
%boarded	926.07	636.72	0.1464	1128.37	738.70	0.1272

Note: All models include county-intercepts and county-variances. All coefficients are multiplied by 10.0.
 * p<.05 (two-tailed)

**Table 5. Effects of Tract Characteristics on Percent Change in Housing Value, by MSA and Race of Home-Owner.
Maximum Likelihood Estimates, Tracts with White and Black Home-Owners.**

	White			Black		
	Estimate	Standard Error	Pr > t	Estimate	Standard Error	Pr > t
Albany						
%Black	3.9223	1.9867	0.0540	-14.9093	8.0680	0.0706
Pov. Factor	-36.8101	17.9087	0.0452*	119.90	95.2666	0.2141
Ed. Factor	5.5455	18.4403	0.7649	-102.82	73.0230	0.1654
Housing Age	3.4462	1.1615	0.0046*	4.3922	5.7004	0.4447
%1-Fam.	-3.0282	0.9777	0.0032*	-7.7348	4.0352	0.0611
%boarded	787.04	397.78	0.0535	1851.08	1389.99	0.1891
Houston						
%Black	0.1778	0.7633	0.8160	1.0545	1.2058	0.3827
Pov. Factor	-31.4516	31.8347	0.3241	5.5298	51.1953	0.9141
Ed. Factor	41.8950	21.3840	0.0512	-10.1206	29.1642	0.7289
Housing Age	11.1106	2.5765	<.0001*	12.0299	4.0791	0.0035*
%1-Fam.	-2.1219	0.9960	0.0341*	0.9561	1.5512	0.5382
%boarded	-3547.70	2913.30	0.2245	-5829.76	4646.80	0.2108
Miami						
%Black	-1.4003	1.2884	0.2796	-0.5143	1.2524	0.6822
Pov. Factor	53.7920	50.5613	0.2898	110.73	49.1491	0.0263*
Ed. Factor	-13.8089	45.3950	0.7616	97.9443	44.1271	0.0286*
Housing Age	1.0199	5.5270	0.8539	2.9825	5.3727	0.5800
%1-Fam.	-0.7979	1.8408	0.6656	0.8360	1.7894	0.6413
%boarded	17355.0	8369.38	0.0406*	150.54	8135.62	0.9853

Note: All models include county-intercepts and county-variances. All coefficients are multiplied by 10.0.

* p<.05 (two-tailed)

Table 5 (cont). Effects of Tract Characteristics on Percent Change in Housing Value, by MSA and Race of Home-Owner. Maximum Likelihood Estimates, Tracts with White and Black Home-Owners.

	White			Black		
	Estimate	Standard Error	Pr > t	Estimate	Standard Error	Pr > t
Philadelphia						
%Black	-1.4286	0.4901	0.0037*	-1.4753	0.6389	0.0213*
Pov. Factor	14.5750	16.2445	0.3700	-43.3781	25.7687	0.0929
Ed. Factor	18.7453	7.6987	0.0152*	34.2464	18.1631	0.0599
Housing Age	2.6237	0.5077	<.0001*	5.5408	1.2443	<.0001*
%1-Fam.	-0.3331	0.4313	0.4403	-1.7669	0.9669	0.0682
%boarded	59.5285	503.38	0.9059	-540.77	561.12	0.3356
San Francisco						
%Black	-2.6759	0.8872	0.0031*	-2.2359	3.5004	0.5241
Pov. Factor	74.0097	23.6265	0.0022*	79.4524	95.9163	0.4090
Ed. Factor	13.2545	17.2007	0.4424	15.0926	76.3551	0.8436
Housing Age	0.2903	1.4932	0.8462	5.6996	5.2718	0.2817
%1-Fam.	0.9063	0.6457	0.1629	0.6218	2.7203	0.8196
%boarded	1654.33	1823.16	0.3659	-7668.68	8247.94	0.3543
Washington, DC						
%Black	-1.9288	0.5991	0.0014*	-1.3271	0.7775	0.0885
Pov. Factor	-17.4774	20.7196	0.3994	-41.9821	25.7014	0.1030
Ed. Factor	33.2371	14.7488	0.0247*	19.5090	19.9777	0.3293
Housing Age	4.1724	1.1497	0.0003*	2.8683	1.6244	0.0781
%1-Fam.	-0.7033	0.3702	0.0580	-1.0775	0.5774	0.0626
%boarded	1513.33	714.21	0.0346*	778.10	861.14	0.3667

Note: All models include county-intercepts and county-variances. All coefficients are multiplied by 10.0.

* p<.05 (two-tailed)

Table 6. Percent of Owner-Occupied Housing Owned by Blacks in 1980, by Quartiles of Housing Price Appreciation, 1980-1990.

	<u>Appreciation Quartiles</u>				
	Q1	Q2	Q3	Q4	Total
Albany					
Mean	3.90	1.65	2.72	13.98	6.15
Median	0.91	1.07	1.59	5.51	1.63
Houston					
Mean	15.37	16.07	29.92	29.92	22.89
Median	3.33	1.35	8.26	7.32	3.79
Miami					
Mean	25.89	24.76	24.12	8.94	21.65
Median	5.01	8.22	4.90	0.22	3.00
Philadelphia					
Mean	50.89	11.80	10.44	13.75	24.20
Median	57.70	2.80	3.35	4.18	5.82
San Francisco					
Mean	6.40	11.18	3.96	14.00	9.04
Median	1.06	1.72	1.12	2.03	1.40
Washington, DC					
Mean	52.74	26.94	16.84	12.94	28.58
Median	54.89	9.32	5.24	4.02	8.65