

Measuring Neighborhood Investments: An Examination of Community Choice

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Community choice is a very important household decision, since it represents an investment in community attributes that can have a significant effect on the quality of life of all household members, particularly by influencing the future prospects of children. In this paper, we examine the housing and community choices of migrants to and within Los Angeles County identified in the 1990 5% public-use sample of the Census. Controlling for income, we find that expenditures on housing structure are quite similar across races. However, controlling for income, black and Hispanic households consume significantly less in community attributes than white households.

Community choice represents a household investment that can have significant effects on the quality of life of household members, particularly on the future prospects of children. There is growing empirical evidence that neighbors matter in determining outcomes that our society views as bad or good. For example, Case and Katz (1991) find that, controlling for a host of characteristics of the individual, neighbor attributes have an effect on the probability of committing a crime, illegal drug use, alcohol abuse and church attendance. Haveman and Wolfe (1994) find that with an increase in a neighborhood's average percentage of youths who are high-school dropouts, a youth's probability of graduating from high school falls, as does educational attainment level. Cutler and Glaeser (1997) find that African Americans in racially segregated communities earn less income and are less likely to be high-school graduates, more likely to be unemployed and more likely to become single mothers.¹

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¹ Cutler, Glaeser and Vigdor (1999) show that segregation of African Americans in urban America peaked in 1970, when the average African American lived in a neighborhood that was 68% African American. By 1990, there was a modest decline in segregation, with the average African American living in a neighborhood that was 56% African American. Massey and Denton (1993) and others have carefully documented the patterns of racial segregation within urban America over time.

The growing evidence that community quality is an important determinant of outcomes in the development of children raises the question of how households choose communities. While any household would like to live in a community with quality neighbors, good schools and low crime, all households face budget constraints such that they must decide how they trade off structure, community and tenure status. This paper investigates how recent Los Angeles migrant households of similar income levels allocate their housing expenditures on housing structure, community and tenure.

We examine the housing structure and neighborhood choices of households in Los Angeles County using the 5% sample of the 1990 Census Public Use Micro Sample (PUMS). The 1990 PUMS provides information on various characteristics of housing structure and geographic information that divides Los Angeles County into 58 communities (PUMAs—Public Use Micro Sample Areas).² We use this geographic information to examine community choice by households that have moved in the previous five years. Recent movers take community attributes as given and face high moving costs which provide a strong incentive to choose the right location.

In this paper, we explicitly define community by measuring crime, neighbor human capital, school quality, environmental quality and accessibility to the central city. By collecting detailed information on specific community attributes, we shed light on the relative importance of individual attributes in determining overall community quality. We also document community quality consumption patterns by demographic group.

We use hedonic methods to decompose housing consumption into consumption of housing structure characteristics and consumption of community attributes. These straightforward methods yield for each household its expenditure on structure and community. These expenditure indexes are used as the dependent variables to estimate household Engel curves to study expenditure patterns. Controlling for income, we find that

² Nelson and Edwards (1993) examine community choice by race using 12 metropolitan files of the American Housing Survey (AHS). The AHS metro files provide sub-metro geography by defining *zones* within each metro area. In their paper, they measure community quality by average income. Our work builds on their paper by addressing a similar question with the 1990 PUMS, which provides data on far more households, and by measuring community quality on the basis of more attributes such as crime, school quality and environmental quality. Gabriel and Rosenthal (1989) examine locational choice among counties within the Washington, D.C. metropolitan area using the 1980 PUMS. Our work builds on theirs by using the more detailed geography of the 1990 PUMS to provide a more in-depth look at community choice within the Los Angeles metropolitan area.

consumption of structure attributes is far more similar across racial groups than consumption of community quality. We find surprisingly large differences in consumption of community quality across racial groups, with whites spending significantly more on community quality than blacks or Hispanics. As expected, we find that for all races, as income rises, a smaller percentage of households move into the worst communities and a larger percentage move into the best communities. However, the percentage of blacks and Hispanics moving into the best communities is considerably smaller than that of whites with similar incomes.

Controlling for income, we would expect differences in structure and community choices to reflect differences in preferences. However, housing choice may be influenced by social networks and lack of information about potential opportunities. In addition, there is an extensive literature documenting limits to community choice for minorities due to housing market discrimination (Turner 1992; Yinger 1986, 1990, 1995; Roychoudhury and Goodman 1996). Regardless of the reasons for the large differences in community expenditures by race presented in this paper, they represent large differences in neighborhood investments which can significantly affect the future prospects of minority children.

In the next section, we outline a conceptual framework to shape the empirical work presented in this paper. In the third section we sketch our empirical methodology; in the fourth section we present the data on households and the characteristics of the communities that they live in. The results from our estimates of structure and community expenditures are presented in the fifth section along with our estimates of the gaps in these expenditures by race controlling for income. Finally, we draw our conclusions from this analysis.

Analyzing Housing Expenditures

This paper focuses on the housing expenditure choices of households who lived in Los Angeles County in 1990 and had switched homes between 1985 and 1990. By studying one large city, we can assume a single labor market, equal access to state-provided public goods such as state universities, and similar natural amenities such as climate. Taking household income as given, each household must choose how to allocate its housing expenditure on three major components: tenure status, structure and community. Neighborhood characteristics are capitalized into local land prices. We assume that movers

take housing prices and community attributes as given.³ This section explores factors which determine how households choose to allocate their housing expenditure.

Homeownership tends to rise with age and income. Homeownership presents considerably higher transaction costs (*e.g.*, agent fees, mortgage origination fees) than renting. In addition, homeownership generally requires sufficient wealth for a down payment as well as sufficient income to qualify for a mortgage. As a result, households that move frequently may find renting less costly. Younger heads of households may be uncertain about their future income prospects or not sure that they want to lock in to a given area.

Household consumption of structure generally increases with household size and household income. DiPasquale and Wheaton (1996, p. 220) find that wealthier households choose structures with more bedrooms. Households with three or four members and income between \$25,000 and \$40,000 consume 3.01 bedrooms on average; if income rises to \$40,000 to \$60,000, bedroom consumption rises to 3.17. Holding income constant, as household size increases, the number of bedrooms increases.

Community may be of greater value to households with school-age children. While all households value living in a safe and clean environment, most adults work and spend a significant amount of time away from their neighborhood. Children are likely to have the greatest amount of social interaction with other members of the community. Neighborhood choice represents an investment in a public good that provides utility for each family member and is an input in the production of child quality (Becker 1993, p. 184). While all households with children value community quality, the presence of housing market discrimination may limit access to certain communities for minority households.⁴

A household that chooses to live in a community with neighbors with high human capital levels, low crime and good schools is making a long-run

³ Clearly, such community attributes as school quality, crime and neighborhood human capital levels depend on the set of people who have chosen to live in the community. Over time, the stock of people in a community is affected by the flow of migrants who enter and exit the community.

⁴ Discrimination may also affect homeownership propensity and structure consumption if minorities face a larger denial rate for home mortgages (Munnell *et al.* 1996) or if structures with particular characteristics are unavailable in minority communities.

investment. Only years later will such an investment pay “dividends.” Parents must form an expectation of what would be the marginal gains for the child of living in a better community. When a family invests in living in a nice neighborhood, it is forgoing private consumption for increased investment in its safety, health and human capital. From the parents’ perspective, neighborhood quality may be a substitute for parents’ time or for market investments in activities such as private tutoring. From the child’s standpoint, there may be few real substitutes for community attributes. While private schools and tutoring may be a substitute for poor local schools, for many children these are not an option given the family budget constraint.

One of this paper’s empirical focuses is to document housing expenditure patterns on structure and community for observationally identical white, black and Hispanic households. In our data, we observe each household’s choice of expenditure on housing, structure and community. These data permit us to test the following hypotheses: Controlling for income, Los Angeles migrants, regardless of race, have:

1. Equal probabilities of owning a home.
2. Equal expenditures on housing structure.
3. Equal expenditures on community.

Empirical Methodology

Census data provides information on each household’s total expenditure on housing, the structure’s attributes and its location within Los Angeles County. We use this information to estimate hedonic price regressions to decompose total expenditure into structure expenditure and community expenditure. The hedonic model we estimate takes the form:

$$\log(\text{price}_{ij}) = \text{constant} + \psi X_i + \gamma Z_j + \epsilon_{ij} \quad (1)$$

where price_{ij} is for household i in community j , X_i is a vector of structure characteristics for the housing unit occupied by household i , and Z_j is a vector of community amenities.

Following Follain and Jimenez (1985) and King (1976), we construct an index of community quality based on a composite of the individual community amenities. The coefficients on the locational amenities serve as

index weights used to construct an index of expenditures on these amenities.⁵ Linearizing the coefficients estimated in Equation (1), we construct the community expenditure index

$$\text{community expenditure}_{ij} = \gamma Z_j \quad (2)$$

We then construct a structure index by subtracting expenditures on locational amenities from total housing expenditures [total housing expenditure as indicated in the Census minus community expenditure as defined in Equation (2)].

An alternative approach generating estimates of community expenditure would be to estimate Equation (1) with the structure variables and PUMA dummy variables rather than the PUMA-specific amenities (the Z 's). While this fixed effects model would yield estimates of expenditures, this approach does not explicitly measure the prices of individual investment attributes. As discussed below, we estimated the fixed-effects model and found that the community expenditures estimated using that model are highly correlated with the expenditure estimates based on Equation (1).

In addition to studying community consumption, based on Equation (2), we also study household consumption of each amenity such as neighbor human capital and local school quality, individually. Below, we present both approaches. We prefer the hedonic approach, because the hedonic price gradient reflects market valuations of the relative importance of the different local amenities.⁶

For Los Angeles migrants, we use the structure and community expenditures to estimate household Engel curves by race to predict how expenditures differ for households of different income levels. The regression equation is

$$\text{expenditure}_{ij} = \psi D_{ij} + U_{ij} \quad (3)$$

⁵ This procedure mimics the cross-city quality-of-life literature [see Blomquist, Berger and Hoehn (1988) and Gyourko and Tracy (1991)]. This literature estimates household expenditure on local public goods and ranks cities with the largest expenditure for these goods as having the highest quality of life.

⁶ We estimate Equation (1) for the entire sample including migrants and non-migrants. Thus, estimated implicit prices do not reflect solely the tastes of migrants.

where $expenditure_{ij}$ is either expenditure on community or expenditure on structure, and D_{ij} is a vector of household attributes.

In addition to estimating Equation (3), we also present regressions of how household consumption of local amenities (Z) vary with household demographics. This regression is

$$Z_{ij} = \psi D_{ij} + \epsilon_{ij} \quad (4)$$

We do not attempt to recover structural demand parameters for community attributes from our hedonic model. Identification of structural parameters requires some underlying price variation which is present when estimating a hedonic model across different urban housing markets but not when examining a single housing market.⁷ The presence of housing market discrimination would present another problem in recovering structural demand parameters from the hedonic. Yinger (1995) and others have argued that search costs can be significantly higher for minority than for majority households.⁸

Data

The 1990 Census of Population and Housing 5% PUMS for Los Angeles County contains 150,338 households records. Each household in the sample resides in one of the PUMAs. These 58 areas represent our geographical variation within the county. In most cases, PUMA boundaries were defined for the Census by state government. While PUMAs generally are aggregations of census tracts and urban places, they do not reflect the boundaries of political jurisdictions. PUMAs are intended to reflect “like” areas containing 100,000 people or more. For each household, we know the PUMA of residence in 1990 and whether or not the household has moved (changed housing units) in the previous five years. While PUMAs are a large unit of analysis for considering neighborhood effects, the data do indicate that the 58 communities in Los Angeles County are quite different on average. However, for this analysis we need to assume that locations within

⁷ For the necessary conditions to identify structural parameters, see Epple (1987).

⁸ Yinger (1995, p. 101) estimates that minority homebuyers pay a premium in search costs on the order of \$3,000 per search. Similarly, Ayres and Siegelman (1995) report that black men are paying a significant premium (10%), or on average an additional \$1,000, to buy cars due to discrimination significantly increasing search costs.

a PUMA are homogeneous, which could be problematic given the size of the PUMAs.⁹

A major goal of this paper is to examine the housing structure and community choices by race and income. Figures 1 to 3 provide evidence on migrant locational choice by race. These maps show substantial differences: blacks are considerably more spatially concentrated in the central city than whites or Hispanics. We get very similar patterns if we consider just high-income households.

A priori, racial segregation does not necessarily mean that minority communities are of lower quality. Communities vary significantly across a large number of attributes. In this paper, we explicitly measure several community attributes for each of the 58 PUMAs in Los Angeles County. Amenities such as climate, state-provided services and University of California education access do not vary across the county. Attributes which do vary within the county and which we measure in this analysis are educational attainment of residents, school quality, air quality and crime.

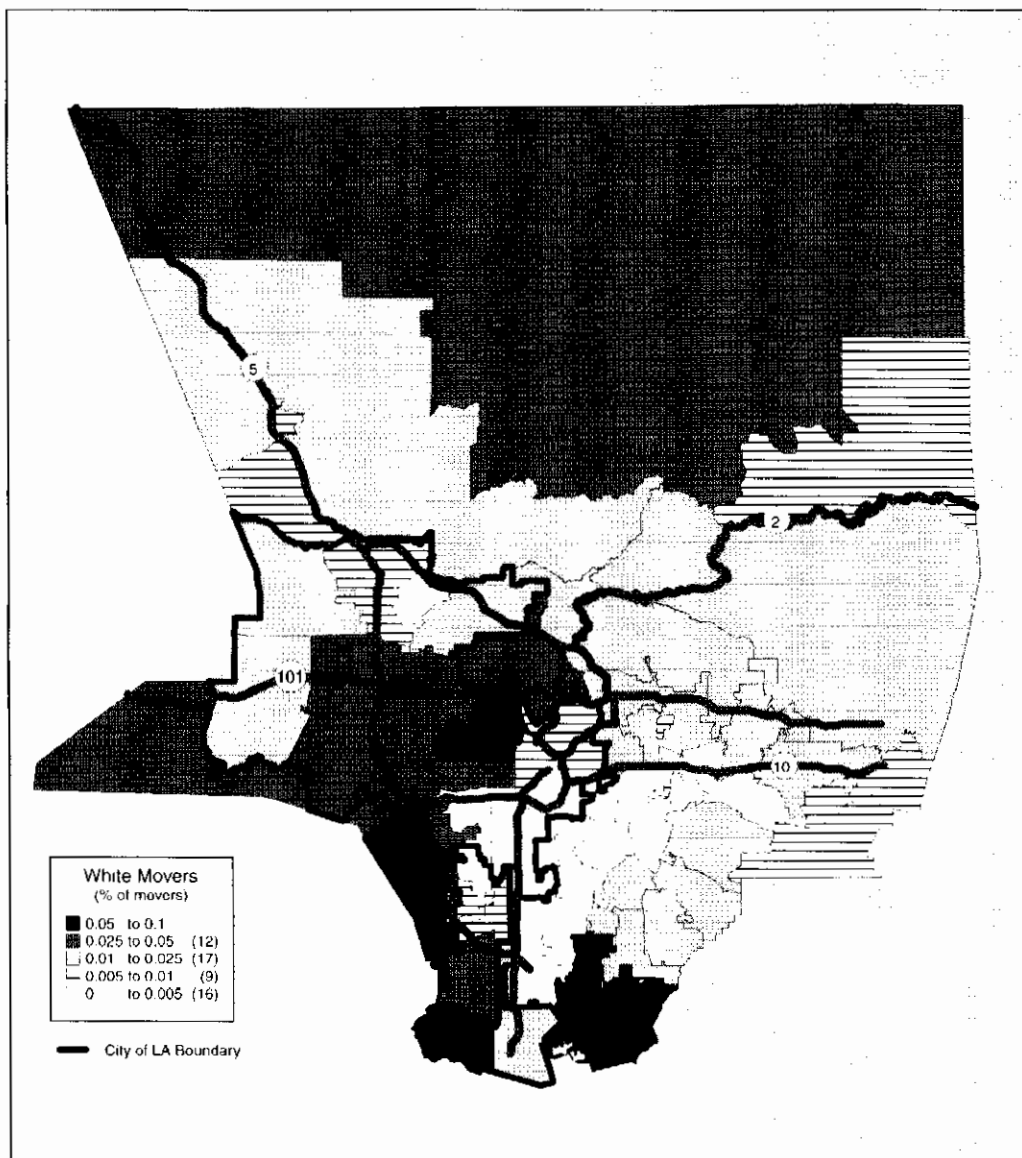
As a proxy for neighborhood human capital, we use the percentage of a PUMA's adult population that are college graduates. Recent empirical studies by Rauch (1993) and Borjas (1995) indicate that there are significant gains from living near highly educated people. As shown in Table 1, on average 20% of household heads within a PUMA are college graduates.

Our measure of school quality is the average math score on an achievement test administered to all eighth graders in the state as part of the California Assessment Program (CAP).¹⁰ As shown in Table 1, the average math score

⁹ Are PUMAs too large and diverse to accurately measure consumption of community quality? The 58 PUMAs in Los Angeles County comprise 1,594 census tracts. To test for within-PUMA heterogeneity, we examine the characteristics of the census tracts that make up each of the PUMAs from the census-tract-level data provided by the U.S. Census. For example, we regress average census-tract percentage of college graduates on the 58 PUMA fixed effects, which yields an R^2 of 0.6, indicating that the variation across PUMAs is greater than the variation within. Regressing average tract percentage white, black and Hispanic on the 58 PUMA fixed effects yields R^2 's of 0.72, 0.66 and 0.66, respectively. This finding increases our confidence that PUMA averages are not masking the existence of racial or ethnic enclaves within PUMAs.

¹⁰ Outside the City of Los Angeles we map school districts to PUMAs and average the scores weighted by district enrollment. The City of Los Angeles is served by the Los Angeles Unified School District. Since this is a large district with enrollment over 500,000 and there is wide variation in the quality of schools within it, using the district average score for all 21 PUMAs in the city would be meaningless. As a result, we allocate all of the junior high schools in the Los Angeles Unified School District

Figure 1 ■ 1990 white-mover destinations.

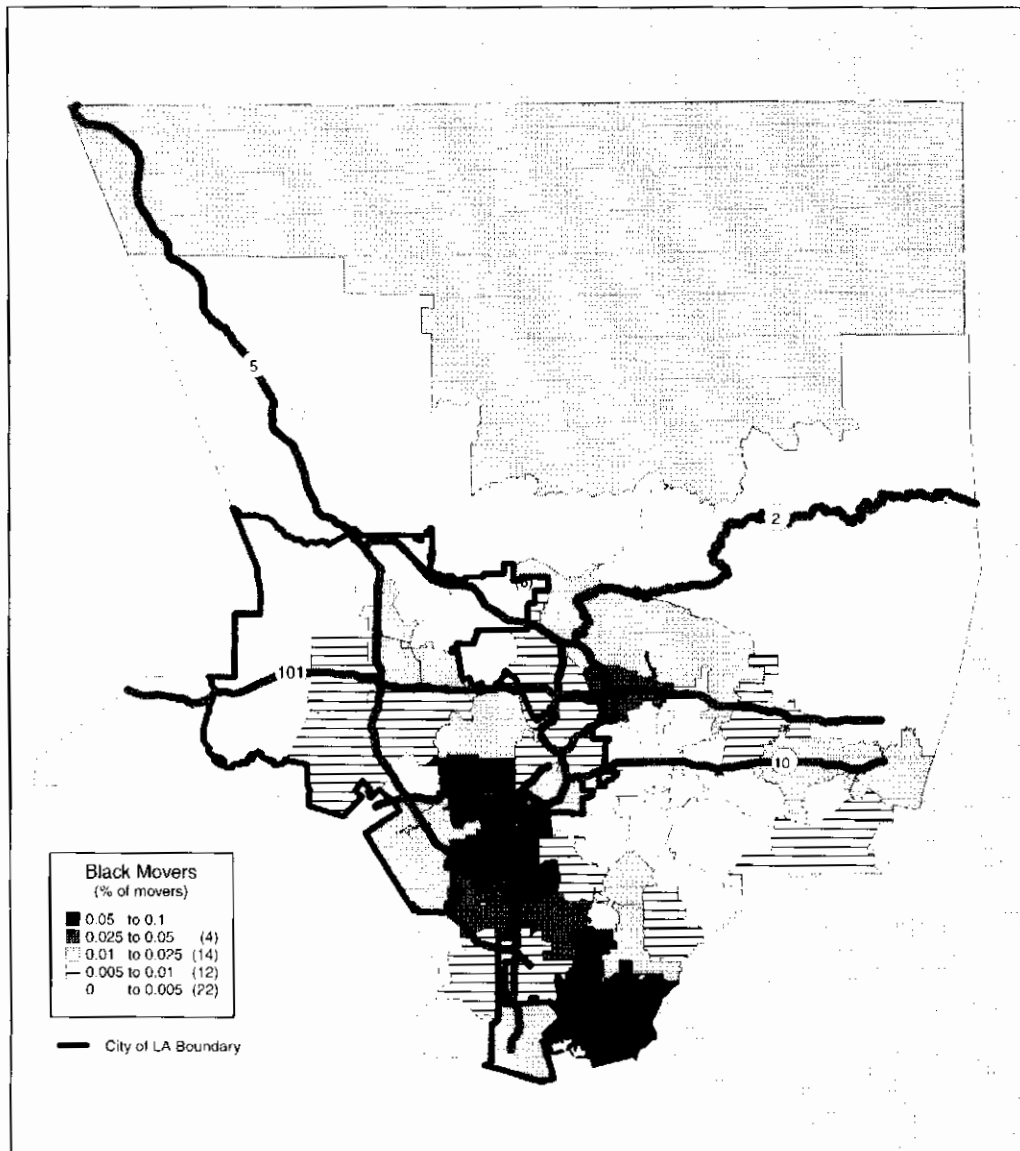


by PUMA is 248.2 with a standard deviation 39.3.¹¹ Air quality data is constructed from ozone data reported by the California Environmental Protection Agency. Los Angeles has the worst ozone smog problem in the

to PUMAs by the address of the school and average the test scores of the schools allocated to each PUMA weighted by school enrollment.

¹¹ To test for within-PUMA heterogeneity, we regress math scores of individual schools on the PUMA fixed effects. We can explain 70% of the variation in individual school math scores using the PUMA fixed effects, providing additional evidence that variation across PUMAs is greater than variation within.

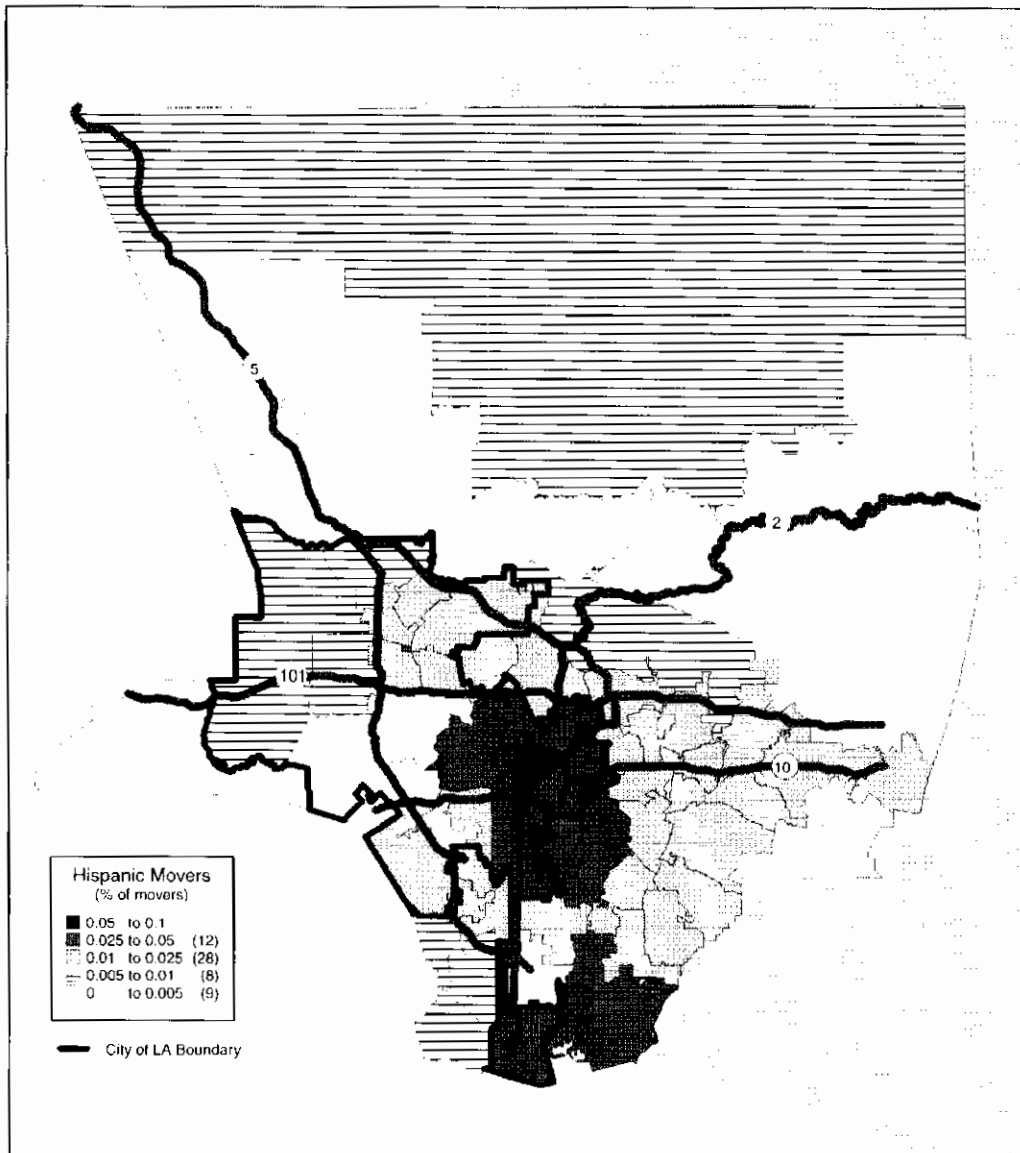
Figure 2 ■ 1990 black-mover destinations.



nation.¹² In 1990, there were 18 monitoring stations within Los Angeles County. We assign each PUMA to the closest monitoring station. The ozone variable is a measurement of the number of hourly readings per year for which ozone exceeded the Clean Air Act standard; as shown in Table 1, on average, nearly 36 readings per year exceed the standard. Not surprisingly, the ozone problem increases dramatically on moving inland.

¹² Krupnick, Harrington and Ostro (1990) and Portney and Mullahy (1990) estimate health production functions using micro data to control for individual smoking and report statistically significant impacts of ozone on respiratory diseases.

Figure 3 ■ 1990 Hispanic-mover destinations.



Our crime data is the number of murders per thousand in population in 1990. As shown in Table 1, on average, there was one murder per 10,000 people in 1990. For the City of Los Angeles, we use data published by the Los Angeles Police Department on crimes by reporting district. There are 18 reporting districts, which we map onto the 21 PUMAs in the city. Outside of the city, we aggregate crime data by cities and urban places to reflect the remaining 37 PUMAs; these data are published by Los Angeles County.

As an estimate of accessibility, we measure the distance between the center of each of the 57 PUMAs and the Civic Center in downtown Los Angeles, located in PUMA 6502. Clearly, Los Angeles, with its many employment

Table 1 ■ Summary statistics.^a

Panel A: Community Characteristics				
Characteristic	Mean			
Percent college graduates	0.202 (0.133)			
Average math score	248.188 (39.309)			
Murder rate per thousand	0.098 (0.084)			
Ozone	35.690 (25.79)			
City of Los Angeles	0.362 (0.485)			
Distance from city hall	14.416 (8.341)			
Number of observations	58			
Panel B: Household Characteristics				
Characteristic	Means			
	All	Whites	Blacks	Hispanics
Homeownership rate	48.2%	56.6%	36.6%	34.7%
Renters:				
Rooms	3.364 (1.481)	3.634 (1.45)	3.660 (1.418)	2.993 (1.443)
Bedrooms	1.431 (0.932)	1.554 (0.898)	1.562 (0.902)	1.255 (0.946)
Rent (annual)	7,033 (2,532)	7,749 (2,610)	6,271 (2,548)	6,340 (2,119)
Number of observations (unweighted)	66,956	29,385	8,411	22,982
Owners:				
Rooms	5.708 (1.672)	6.007 (1.563)	5.660 (1.556)	5.022 (1.698)
Bedrooms	2.796 (0.954)	2.908 (0.898)	2.707 (0.883)	2.531 (1.009)
Home value	239,986 (106,964)	264,840 (105,120)	164,693 (89,362)	190,646 (83,898)
Number of observations (unweighted)	71,225	44,442	5,819	13,538

^a Standard deviations are in parentheses below the means.

centers, is a poor example of a monocentric city. However, the City of Los Angeles is still the largest employment center for Los Angeles County residents, with 41.5% of county residents who are employed working in the city. As a result, distance to the center seems a reasonable if somewhat crude estimate of accessibility.

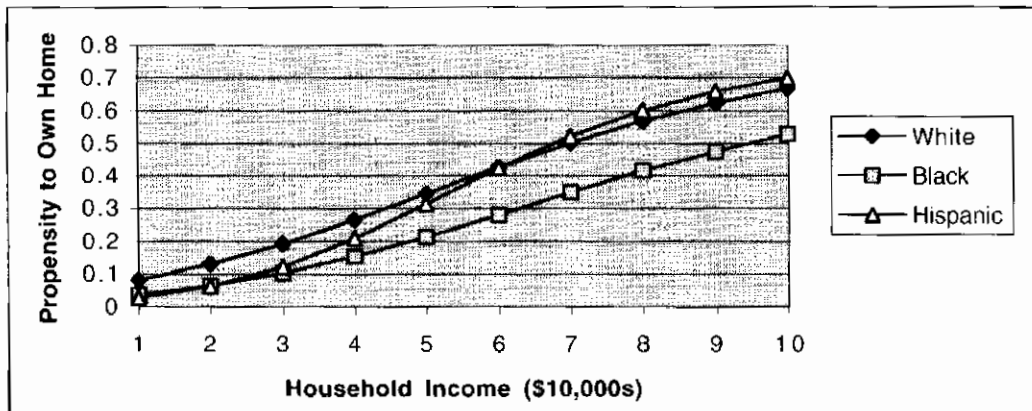
As shown in Table 1, 48.2% of households in Los Angeles are homeowners. For white households the homeownership rate is 56.6%, while for black households it is 36.6%. As shown in Figure 4, the propensity to own increases with income, but, controlling for income, blacks have significantly lower ownership rates. As a result, we examine the structure and community choices of both homeowners and renters.

Home prices and rents are self-reported. Home prices are top-coded at \$400,000, while rents are top-coded at \$1,000. As shown in Table 1, the average reported home price is \$239,986 and the average reported gross rent is \$7,033 per year, or \$586 per month. On average, white owners have homes valued at considerably more than those of black or Hispanic owners, while homes owned by blacks have somewhat lower values than those owned by Hispanics. Unfortunately, the Census is quite limited in data on the standard attributes of the house. For example, there is no information on the number of bathrooms or the size of the unit in square feet.¹³ As shown in Table 1, on average, rental units have fewer rooms and bedrooms than owner-occupied units. The homes of white and black renters are similar in size, while Hispanic renters are consuming considerably less space. White owners are consuming 0.34 more rooms than black owners and one more room than Hispanic owners.

Results

In Table 2, we present average consumption of our community attributes by tenure, race, income and whether the household is a recent mover. In general, the differences in average consumption of community attributes are small

¹³ The American Housing Survey (AHS) provides much more extensive characteristics of the home and neighborhood than the Census. Like the Census, the AHS metro files in recent years provide sub-county geography (zones). However, the metropolitan surveys are small, providing very few observations per zone. Examining household locations by race would yield very small samples by zone with some zones having no observations. DiPasquale and Somerville (1995) estimate house price hedonic models using the AHS metro files and provide a detailed description of the advantages and disadvantages of the AHS. Given the focus of this paper on locational choice, the 1990 Census, with its limited information on housing characteristics but large sample and sub-county geography, is the better data source.

Figure 4 ■ Homeownership propensity by income and race.

between recent movers and non-movers for white and Hispanic households. For black households, recent movers are moving to communities with better schools, more educated neighbors and more pollution and further from the CBD than non-mover black households. Recent-mover black households are considerably less likely to live in the central city than non-movers; for middle-income black renters, 63% of non-movers are in the central city, while only 45% of recent movers are.

As expected, with increases in income, households consume better communities. For example, the percent of residents in the community with a college degree rises with income. A considerably higher portion of the neighbors of white households across the three income groups have college degrees than do the neighbors of black and Hispanic households. Similarly, school quality as measured by math scores increases with income for all three racial groups, with white households in the lowest income group consuming considerably better schools than black and Hispanic households in the highest income groups. For white households, community crime rates are low and there is little change in exposure to crime as incomes rise. For black households, the community murder rate is considerably higher for all income groups than for Hispanic and white households; the murder rate declines significantly with income for black households. Across all income groups, black and Hispanic households live in considerably more racially diverse communities than whites. The portion of residents who are black declines with increasing income for all three groups.

As discussed earlier, the data in Table 2 treats all community attributes as though they had equal weight in determining community quality. Clearly, households are in fact more concerned about some attributes than others. Crime and school quality might be expected to receive more consideration

Table 2 ■ Average consumption of community attributes by race, tenure, mobility and income.

	Owners						Renters					
	Movers			Non-movers			Movers			Non-movers		
	<\$20,000	\$20,000 to \$40,000	>\$40,000	<\$20,000	\$20,000 to \$40,000	>\$40,000	<\$20,000	\$20,000 to \$40,000	>\$40,000	<\$20,000	\$20,000 to \$40,000	>\$40,000
Whites												
College	0.24	0.24	0.29	0.23	0.24	0.28	0.26	0.28	0.31	0.27	0.28	0.31
Math	262.83	262.59	270.11	258.25	261.71	268.26	255.39	260.67	265.75	253.30	257.16	263.09
Murder	0.08	0.08	0.07	0.09	0.08	0.07	0.09	0.08	0.08	0.09	0.08	0.08
Ozone	41.06	42.96	38.36	36.95	37.90	36.62	34.36	32.75	29.45	30.63	29.51	27.80
Distance	19.94	21.95	20.67	16.43	17.28	17.75	15.53	16.18	16.35	14.19	14.87	15.34
City of LA	0.31	0.31	0.34	0.31	0.32	0.36	0.43	0.41	0.41	0.48	0.45	0.43
White	0.58	0.60	0.64	0.52	0.55	0.61	0.55	0.58	0.62	0.53	0.55	0.59
Black	0.06	0.06	0.05	0.07	0.06	0.05	0.07	0.06	0.06	0.07	0.07	0.06
Hispanic	0.25	0.24	0.21	0.30	0.28	0.23	0.27	0.25	0.22	0.29	0.27	0.23
Blacks												
Income	<\$20,000	\$20,000 to \$40,000	>\$40,000	<\$20,000	\$20,000 to \$40,000	>\$40,000	<\$20,000	\$20,000 to \$40,000	>\$40,000	<\$20,000	\$20,000 to \$40,000	>\$40,000
College	0.13	0.14	0.18	0.10	0.13	0.16	0.14	0.18	0.20	0.12	0.15	0.18
Math	209.41	219.60	232.48	197.43	206.79	217.80	215.80	227.45	234.63	203.40	214.14	222.79
Murder	0.18	0.17	0.15	0.21	0.19	0.17	0.17	0.16	0.14	0.18	0.16	0.15
Ozone	21.92	25.57	27.98	17.21	19.76	19.84	21.59	22.94	24.35	18.99	19.91	19.84
Distance	11.05	12.50	14.96	8.70	10.01	11.31	10.72	11.86	12.53	8.41	9.75	10.51
City of LA	0.45	0.43	0.32	0.59	0.47	0.40	0.57	0.45	0.42	0.71	0.63	0.55
White	0.21	0.24	0.34	0.12	0.17	0.24	0.24	0.31	0.37	0.14	0.22	0.28
Black	0.34	0.33	0.27	0.42	0.39	0.33	0.32	0.26	0.21	0.39	0.34	0.29
Hispanic	0.39	0.35	0.30	0.41	0.37	0.34	0.37	0.33	0.32	0.41	0.36	0.34

in a household location decision than perhaps air quality or distance to the city center. The hedonic method outlined earlier provides the relative weights of community attributes, permitting us to construct an index of community quality. We estimate Equation (1) for both owners and renters, where the log of price is the dependent variable and the independent variables are number of rooms, number of bedrooms, age of the unit, structure type and the six PUMA characteristics.¹⁴

In Table 3, we present results from six hedonic models.¹⁵ In the first three models, the dependent variable is the log of rent; in models 4 through 6, the dependent variable is the log of price. The structure coefficients provide the expected results. For our purposes, we focus on the coefficients on the community attributes, which are estimates of implicit prices of each of the attributes. In models 1 and 4, locations have higher prices if they have higher test scores, higher percentage of college graduates and lower ozone pollution. In model 1, these estimates indicate that a 10-point increase in the math scores of local school children increases rents by 0.91%. A 10-percentage-point increase in a PUMA's college graduate population increases rents by 8.3%. Ozone's coefficient indicates that a 10-day increase in ozone violations lowers rents by 1.2%.¹⁶ Our coefficient on homicides indicate that an increase of 1 murder per thousand people lowers rents by 19%. Surprisingly, homicides are not statistically significant in the rent regression. The large standard errors may be due, in part, to the fact that within the City of Los Angeles the crime reporting district boundaries are quite different from the PUMA boundaries. The central city dummy variable is negative, but

¹⁴ Santa Monica has rent control and is located in PUMA 6423. In order to control for these non-market-determined rents, we include a dummy variable for PUMA 6423.

¹⁵ The hedonics present two important methodological issues. The presence of group effects is an issue if two housing units from the same community have correlated error terms. We can correct for these group effects by using OLS with the Huber correction for the standard errors. Using OLS without the correction would understate the standard errors, therefore overstating the statistical significance of many of the variables (Moulton 1986; Gyourko and Tracy 1991). The second methodological issue stems from the fact that both rents and house prices are top-coded. The standard correction for top coding would be to estimate the hedonic using a tobit specification. However, there is no correction for group effects with the tobit. As a result, we faced a difficult choice of which problem to address. After extensive testing, we concluded that the group effects had a larger effect on our results than the top coding and therefore estimate our hedonics using OLS with the Huber correction.

¹⁶ Given that ozone accedences increase considerably on moving inland, we had some concern that our air-quality data might be serving as a proxy for temperature increases with respect to increases in distance from the coast. Including average July temperature in our model did not significantly change the air-quality results, but the correlation between July temperature and ozone is roughly 0.6.

Table 3 ■ Determinants of Los Angeles rents and home prices.^a

Dependent variable	Regressions					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Structure Type:	Log rent	Log rent	Log rent	Log home value	Log home value	Log home value
1 unit detached	0.0567** (0.0242)	0.0344 (0.0263)	0.0618** (0.0241)	0.2820** (0.0429)	0.1349** (0.0643)	0.3094** (0.0428)
1 unit attached	0.0151 (0.025)	-0.0106 (0.0264)	0.0225 (0.0248)	0.1334** (0.0411)	0.0051 (0.0628)	0.1616** (0.0427)
2 units	-0.0145 (0.0189)	-0.0240 (0.022)	-0.0052 (0.0192)	0.4138** (0.0499)	0.2758** (0.0735)	0.4502** (0.0521)
3-4 units	-0.0319 (0.0201)	-0.0400* (0.0212)	-0.0230 (0.0198)	0.3258** (0.0505)	0.2156** (0.0656)	0.3634** (0.0545)
5-9 units	-0.0271 (0.0199)	-0.0207 (0.0215)	-0.0205 (0.0195)	0.1573** (0.0386)	0.0850* (0.0454)	0.1794** (0.0401)
10-19 units	-0.0103 (0.0202)	0.0000 (0.0215)	-0.0063 (0.0202)	0.0003 (0.043)	-0.0271 (0.0459)	0.0135 (0.0431)
20-49 units	0.0463** (0.019)	0.0498** (0.0204)	0.0476** (0.0189)	-0.0569 (0.0411)	-0.0690 (0.0443)	-0.0477 (0.0416)
Rent control	-0.3612** (0.0374)	-0.3076** (0.049)	-0.3068** (0.0343)			
Rooms	0.0123** (0.0057)	0.0188** (0.0061)	0.0150** (0.0051)	0.0869** (0.0056)	0.1057** (0.0071)	0.0888** (0.0051)

Table 3 ■ continued

	Regressions					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Bedrooms	0.1367** (0.0075)	0.1298** (0.008)	0.1354** (0.0073)	0.0275** (0.0064)	0.0154** (0.007)	0.0248** (0.0061)
Year Built:						
1989-90	0.2732** (0.023)	0.2550** (0.0231)	0.2712** (0.0219)	0.1679** (0.0429)	0.1117** (0.0364)	0.1647** (0.0406)
1985-88	0.2304** (0.0167)	0.2202** (0.0181)	0.2301** (0.0161)	0.1708** (0.0324)	0.1124** (0.0347)	0.1696** (0.0311)
1980-84	0.0951** (0.0169)	0.0789** (0.0183)	0.0980** (0.0161)	0.1342** (0.0309)	0.0862** (0.0354)	0.1247** (0.0295)
1970-79	0.0992** (0.0171)	0.0891** (0.0172)	0.1020** (0.0159)	0.1186** (0.0285)	0.0874** (0.0315)	0.1055** (0.0267)
1960-69	0.0966** (0.0139)	0.0898** (0.0144)	0.1001** (0.013)	0.0894** (0.0258)	0.0572* (0.0326)	0.0728** (0.0239)
1950-59	0.0576** (0.0136)	0.0503** (0.0141)	0.0608** (0.0129)	0.0488** (0.0211)	0.0136 (0.0303)	0.0215 (0.0182)
1940-49	0.0237** (0.0102)	0.0188* (0.0102)	0.0269** (0.0098)	0.0052 (0.0144)	-0.0051 (0.0209)	-0.0063 (0.0141)
Black			-0.3959** (0.1491)			-0.7956** (0.258)
White			-0.0498 (0.1395)			-0.0454 (0.2012)

Table 3 ■ continued

Regressions						
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Hispanic			-0.2032 (0.1567)			-0.3252 (0.2114)
College graduates	0.8319** (0.1019)		0.6750** (0.1195)	1.5247** (0.1499)		1.2971** (0.1752)
Ozone	-0.0012** (0.0004)	-0.0025** (0.0006)	-0.0013** (0.0003)	-0.0010* (0.0005)	-0.0030** (0.0008)	-0.0011** (0.0005)
Murder	-0.1849 (0.1461)	-0.3478 (0.2123)	0.0439 (0.1548)	-0.3713 (0.2852)	-0.5118 (0.3679)	0.0530 (0.2147)
Math score	0.0009** (0.0004)	0.0032** (0.0007)	0.0003 (0.0004)	0.0010** (0.0005)	0.0053** (0.0009)	-0.0001 (0.0006)
Distance	0.0002 (0.0021)	0.0003 (0.0029)	-0.0018 (0.0022)	-0.0057** (0.0026)	-0.0065* (0.0038)	-0.0087** (0.0032)
City of LA	-0.0390* (0.0221)	0.0187 (0.0325)	-0.0324* (0.0196)	0.0518 (0.0414)	0.1846** (0.055)	0.0481 (0.0329)
Constant	5.6316** (0.1049)	5.2851** (0.1721)	5.9409** (0.2047)	10.8944** (0.1449)	10.3156** (0.2649)	11.4314** (0.3052)
Adjusted R ²	0.276	0.249	0.281	0.389	0.333	0.402
No. of observations (unweighted)	63,250	63,250	63,250	71,224	71,224	71,224

^a All models are estimated using OLS with the Huber correction of standard errors weighted by PUMS housing weights.

* indicates that the coefficient is statistically significant from zero at the 10% level.

** indicates that the coefficient is statistically significant from zero at the 5% level.

Notes: The omitted structure type category is 50 or more units. The omitted year built category is before 1940.

statistically insignificant; the coefficient indicates that rents in the central city are 3.9% lower than rents outside the city. Overall, this model explains 27.6% of the variation in rents. While there is clearly considerable variation that is not explained in this model, our six community attributes explain 80% of the variation in average rents across PUMAs.¹⁷ In model 4, we estimate the same equation for homeowners. The results are quite similar to those in model 1. The presence of college graduates in the community has a larger effect on home prices than on rents; a 10-percentage-point increase in college graduates increases prices by 15.2%.

We were concerned that our results might be driven by the college-graduate variable. As a result, we drop this variable in models 2 and 5. Dropping college graduates decreases the adjusted R^2 from 0.276 to 0.249 in the rent equation. The largest effect of dropping this variable is on the coefficients on math scores, ozone and the murder rate. The coefficient on math scores more than triples in size in the rent equation and increases fivefold in the home-price equation.¹⁸ The coefficient on murder nearly doubles in size in the rent equation. While the college-graduate variable is important, it is not driving our results.

The hedonic models discussed thus far do not include any information on neighborhood racial composition, which is often used in hedonic estimations as a proxy for neighborhood characteristics not explicitly measured. As we argued earlier, we take a stand on the specific community attributes that matter in the location decisions of households and explicitly measure those attributes. However, in models 3 and 6 we add the racial composition of the PUMAs (percentage white, black and Hispanic) to the specification in models 1 and 4 to see the effect of adding race to the model. The results in model 3 indicate that there is a rent discount for living in black and Hispanic areas, but it is quite small. A 10-percentage-point increase in blacks lowers rents by 4.0%, while a 10-percentage-point increase in Hispanics lowers rents by 2.0%. In model 6, a 10-percentage-point increase in blacks lowers home prices by 8.0%, while a 10-percentage-point increase in Hispanics lowers home prices by 3.3%.

¹⁷ We ran a fixed-effects model where our community attributes are replaced with PUMA dummy variables. We then regressed the estimated community fixed effects on our six community attributes, which explained 80% of the variation in community value.

¹⁸ The correlation between PUMA math score and percentage of college graduates is 0.63.

We use the estimated coefficients on community attributes in models 1 and 4 of Table 3 as community quality index weights to collapse each PUMA into a one-dimensional community quality index for renters and owners, respectively. Intuitively, the hedonic yields a set of index weights. Expenditure on community is a function of the community's quantity of each attribute multiplied by its implicit price and then summed over the set of attributes. This index has a cardinal interpretation, measured in dollars, that indicates how much one must pay to live in PUMA *a* over PUMA *b*. This index does not indicate the consumer surplus earned by choosing *a* over *b*.

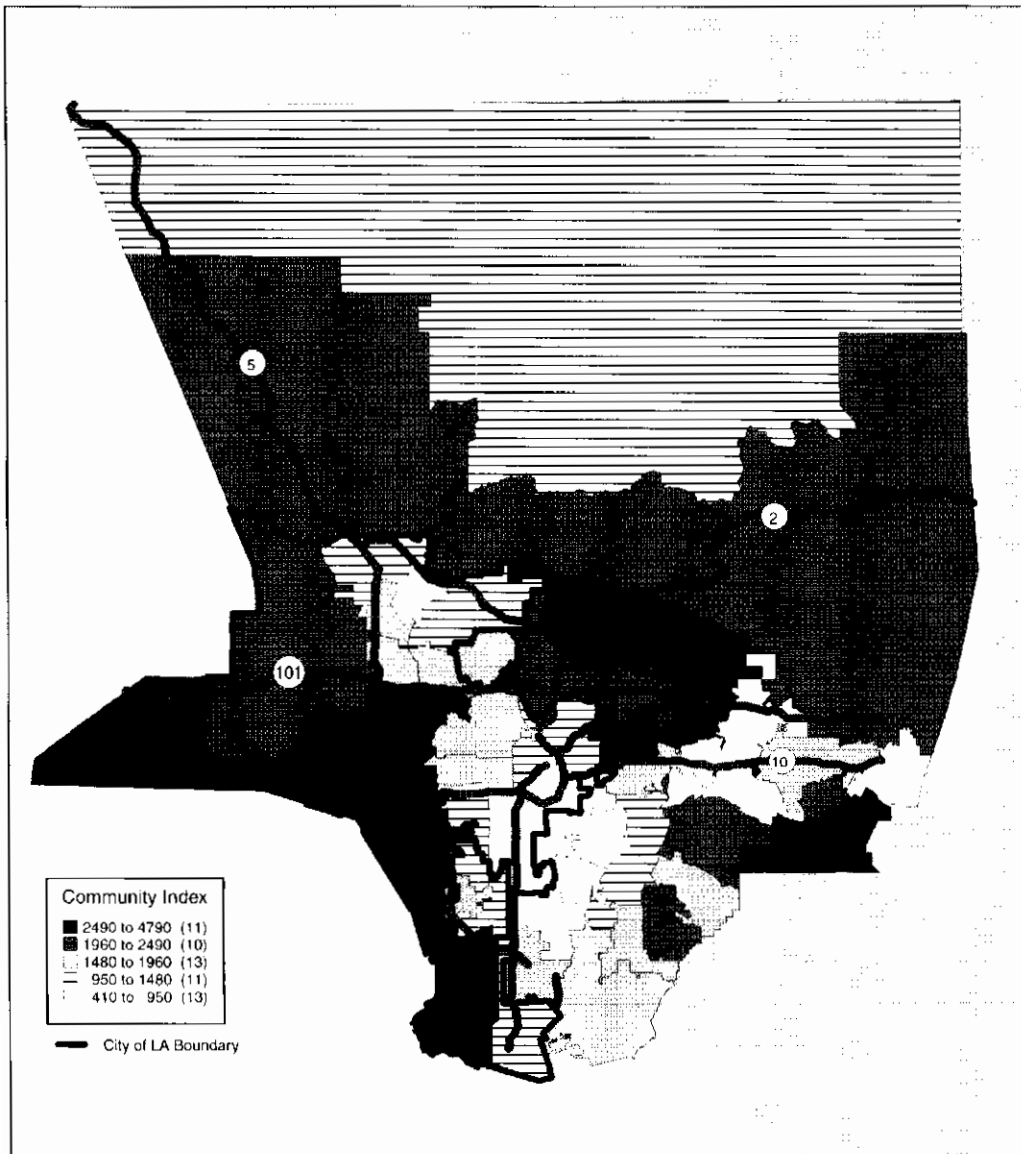
Our estimates indicate wide variation in community quality across the county. Figure 5 presents the spatial variation in our community quality estimates for renters; the correlation between our community quality indexes for renters and homeowners is 0.94. As expected, the community quality estimates tend to be highest along the coast.

By sorting our community quality index, we can rank the 58 communities in Los Angeles County. In Table 4, we present the 10 best and 10 worst communities. Redondo Beach/Manhattan Beach is the top-ranked PUMA based on the rental index, followed by Santa Monica and Bel Air/West Hollywood; Bel Air/West Hollywood is the top-ranked PUMA based on the owner index, followed by Westwood/UCLA and Redondo Beach/Manhattan Beach. Watts is the bottom-ranked PUMA based on the rental index, followed by South Central and Compton; Compton is the bottom-ranked PUMA based on the owner index, followed by La Verne/Pomona and Lynwood/S. Gate. These estimates imply that a renter who moves from the top-ranked PUMA to the bottom-ranked PUMA will be paid \$4,374 per year in compensation for the decrease in community quality.

In panel B of Table 4, we examine the Census data on recent-mover renters and owners to characterize PUMA choice by race and income.¹⁹ As shown in Table 4, for renters, community investment is a normal good. Richer people of all races are more likely to move to the top-10 communities. For blacks, we find that only 3.7% of migrants who have incomes less than \$20,000 move to a top-10 PUMA, while 34.8% move to a PUMA in the bottom 10. Black families with incomes greater than \$40,000 are almost

¹⁹ This part of our work builds on Kain and Quigley (1975), which examined household consumption of housing and locational attributes by race and family type using a 1967 survey of 2,000 St. Louis households.

Figure 5 ■ 1990 community index for renters.



four times as likely (13.7%) to move to the top 10 than poorer blacks and are much less likely to live in the bottom 10 (12.4%). For whites, we find that regardless of income, they are very unlikely to locate in the 10 worst communities. The probability of living in such a community drops from 3.4% to 0.8% as income rises. Whites are much more likely to live in a top-10 community; the poorest white renters have a 22.1% probability of moving into the top 10, much greater than the probability of the richest blacks or Hispanics moving into those communities. Finally, Hispanic migrant renters are similar to black migrant renters in that they have a high probability of

Table 4 ■ Community rankings.

Panel A: Best and Worst Communities		Annual Community Expenditure	Owners	Total Community Expenditure
Renters				
Ten Best Communities				
Redondo Beach/Manhattan Beach		\$4,790	Bel Air/West Hollywood	\$247,888
Santa Monica		4,327	Westwood/UCLA	243,521
Bel Air/West Hollywood		4,182	Redondo Beach/Manhattan Beach	226,398
Westwood/UCLA		3,907	Beverly Hills/West Hollywood	179,934
Beverly Hills/West Hollywood		3,657	Santa Monica	176,488
Torrance		3,192	LA-Mar Vista Plains	164,436
LA-Mar Vista Plains		3,069	Arcadia/San Gabriel	132,163
Diamond Bar		2,876	Alhambra	131,166
Arcadia/San Gabriel		2,784	Torrance	129,937
Alhambra		2,778	Diamond Bar	113,591
Ten Worst Communities				
Watts		\$416	Compton	\$7,309
South Central		602	La Verne/Pomona	9,102
Compton		630	Lynwood/S. Gate	18,349
Arleta		645	South El Monte	18,661
Chinatown/Boyle Heights		685	N. L.A. County	18,924
Huntington Park		740	Watts	20,971
Lynwood/S. Gate		762	Huntington Park	21,894
Bell Gardens/Commerce		793	Bell Gardens/Commerce	22,324
Downtown/Civic Center		813	El Monte	22,644
South El Monte		828	Arleta	26,172

Note: As discussed in the text, community expenditure is calculated as the price of community attributes (based on model 1 in Table 3 for renters and model 4 for owners) times the quantity of the attributes by community (PUMA).

Table 4 ■ Continued

		Panel B: Probability of Moving to Best Communities vs. Worst Communities by Race, Income Group and Tenure					
		Whites		Blacks		Hispanics	
		<\$20,000	\$20,000 to \$40,000	<\$20,000	\$20,000 to \$40,000	<\$20,000	\$20,000 to \$40,000
All							
Renters:							
Ten best communities	19.4%	22.1%	30.1%	39.2%	3.7%	7.6%	13.7%
Ten worst communities	12.6%	3.4%	1.3%	0.8%	34.8%	19.7%	12.4%
Owners:							
Ten best communities	22.7%	23.0%	16.9%	30.4%	5.7%	6.2%	11.4%
Ten worst communities	15.3%	11.6%	17.0%	9.4%	43.3%	29.9%	21.4%

Note: Ten best and ten worst communities match panel A.

moving into the worst areas at low incomes (29.5%). Interestingly, as incomes grow over \$40,000, the probability of a Hispanic household moving to the worst areas is still high at 19.3%.

For owners, as shown in panel B of Table 4, the story is more complicated. Holding income and race constant, owners are more likely to live in the worst communities. For example, 9.4% of white households with incomes over \$40,000 live in the 10 worst communities, while only 0.8% of high-income white renters live in these communities. It appears that due to budget or wealth constraints, households choosing to own locate in worse communities than similar households that choose to rent. The data in Table 4 do show that in general higher-income households are less likely to move to the 10 worst communities and more likely to move to the 10 best communities.

The results presented in panel B of Table 4 provide a rather crude measure of the relationship between income and community choice, since the income categories are broad and we only control for tenure and race. We estimate structure and community expenditure regressions, presented in Table 5, for both owners and renters based on Equation (3). The specification includes controls for the age, race, sex, marital status and citizenship of the household head, and household characteristics including household size, share of members under age 18 and household income. To examine differences in structure and community expenditures by race and income, we plot Engel curves for whites, blacks and Hispanics by tenure.

As shown in Figure 6, there is a large gap between community expenditures by whites and those by minority households at all income levels. At \$50,000 in income, we find that white renters spend \$2,418 per year on community quality, which is \$741 more than black renters and \$669 more than Hispanic renters on average.²⁰ Surprisingly, in Figure 6, the slopes of the lines are quite flat, indicating that the highest income black household never reaches the community investment level of the lowest-income whites.²¹

²⁰ Researchers who have used panel data to study permanent income by race have found evidence that is inconsistent with the claim that permanent-income differences drive our results. Lillard and Willis (1978) use the Panel Survey of Income Dynamics to study transitory components of income for whites and blacks and find larger permanent and smaller transitory variances in log earnings among blacks than among whites (p. 992).

²¹ One potential explanation for the low income elasticities in Figure 6 is unobserved community heterogeneity. If minority communities feature greater unobserved

Table 5 ■ Household expenditure on ownership, community and structure.^a

Dependent variable	Regressions					
	All			Renters		Owners
	Owns home	Community index	Structure index	Community index	Structure index	Community index
Household income	0.5376** (0.003)	108.8204** (1.6382)	604.5635** (3.6591)	320.9378** (6.6047)	997.5505** (10.1417)	
Household income squared	-0.0243** (0.0003)	-2.0983** (0.1759)	-31.8742** (0.3928)	2.3365** (0.4281)	-30.7866** (0.6574)	
Household income* black	0.0575** (0.0101)	98.0486** (4.2615)	53.3116** (9.5183)	170.1400** (26.6139)	-521.2823** (40.8666)	
Household income squared* black	-0.0045** (0.0011)	-13.8606** (0.5966)	-6.8116** (1.3326)	-13.2142** (2.2525)	53.7388** (3.4587)	
Household income* hispanic	0.3712** (0.0084)	-7.0547** (3.5148)	-63.9380** (7.8505)	65.9858** (20.4106)	-726.0432** (31.3413)	
Household income squared* hispanic	-0.0312** (0.001)	-0.7897 (0.5187)	1.8054 (1.1585)	-3.9131 (2.045)	74.6720** (3.1402)	
Household income cubed	0.0003** (0)	-0.0041 (0.0045)	0.5225** (0.01)	-0.1289** (0.0075)	0.2806** (0.0115)	
Household income cubed* black	0.0001** (0)	0.4010** (0.0169)	0.1675** (0.0379)	0.2041** (0.0474)	-1.2096** (0.0728)	
Household income cubed* hispanic	0.0007** (0)	0.0413** (0.0168)	-0.0090 (0.0375)	-0.1484** (0.0534)	-1.6720** (0.082)	

Table 5 ■ continued

Dependent variable	Regressions					
	All		Renters		Owners	
	Owens home	Community index	Community index	Structure index	Community index	Structure index
Age:						
30-39	0.7655** (0.0066)	-5.3878** (2.5177)	121.8729** (5.6234)	470.5264** (21.5139)	926.1490** (33.0353)	
40-49	1.0978** (0.0072)	-14.2223** (3.0496)	257.3800** (6.8113)	700.5366** (22.5405)	1907.0060** (34.6117)	
50-59	1.3151** (0.0087)	-123.5459** (3.9672)	197.3743** (8.8609)	708.7140** (26.0393)	2076.6230** (39.9843)	
60-69	1.6074** (0.0091)	-190.4192** (3.9635)	-402.1795** (8.8525)	1129.7060** (28.0483)	1954.5520** (43.0693)	
Share of household under age 18	1.0862** (0.0136)	-106.3225** (5.9823)	206.9727** (13.3616)	777.9286** (38.8532)	3827.2750** (59.6605)	
Persons in household	-0.1100** (0.0018)	-83.6216** (0.792)	265.3859** (1.7691)	-455.5367** (5.1414)	-136.1824** (7.8949)	
Single female head of household	0.1032** (0.007)	80.4075** (2.7213)	55.4495** (6.078)	662.9189** (23.0996)	-655.8989** (35.4703)	
Married	0.8520** (0.0063)	-15.9097** (2.7723)	200.0213** (6.1921)	-361.9853** (19.4838)	1267.2110** (29.9181)	
Born in U.S.	0.0139** (0.0062)	-7.6317** (2.8504)	318.8491** (6.3665)	-618.9589** (17.3445)	-289.7396** (26.6332)	

Table 5 ■ continued

Dependent variable	Regressions					
	All		Renters		Owners	
	Owens home	Community index	Community index	Structure index	Community index	Structure index
Race:						
Black	-0.8374** (0.0247)	-934.7255** (7.4094)	-343.1244** (16.5492)	-3031.1500** (81.669)	-635.1893** (125.4058)	
Hispanic	-1.1742** (0.0191)	-618.6533** (6.4137)	-476.9500** (14.3251)	-2285.2350** (57.7302)	309.4638** (88.6468)	
Other	0.0965** (0.008)	-232.0768** (4.0684)	-275.9920** (9.0869)	-411.5974** (21.8616)	-686.7239** (33.5693)	
Constant	-3.5849** (0.0124)	2238.7310** (5.0315)	3134.1330** (11.2379)	6316.4080** (37.1422)	4836.1080** (57.0333)	
Adjusted R^2	0.226 ^b	0.261	0.245	0.232	0.187	
No. of observations (unweighted)	58,368	36,930	36,930	21,483	21,438	

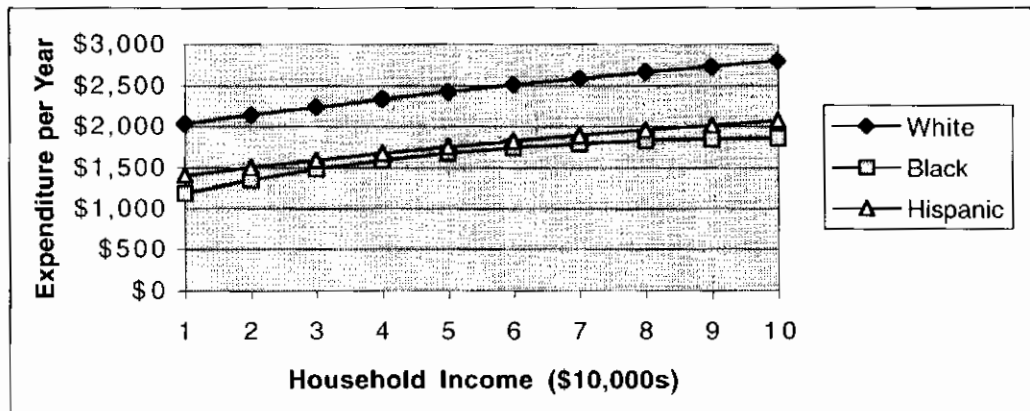
^a All models are estimated using OLS except the homeownership model, which is a logit estimation. Estimations are weighted by PUMS housing weights.

^b Pseudo- R^2 .

*indicates that the coefficient is statistically significant from zero at the 10% level.

**indicates that the coefficient is statistically significant from zero at the 5% level.

Notes: Household income is measured in tens of thousands of dollars. Community index defined in Table 4. The omitted race category is white. The omitted age category is 20-29.

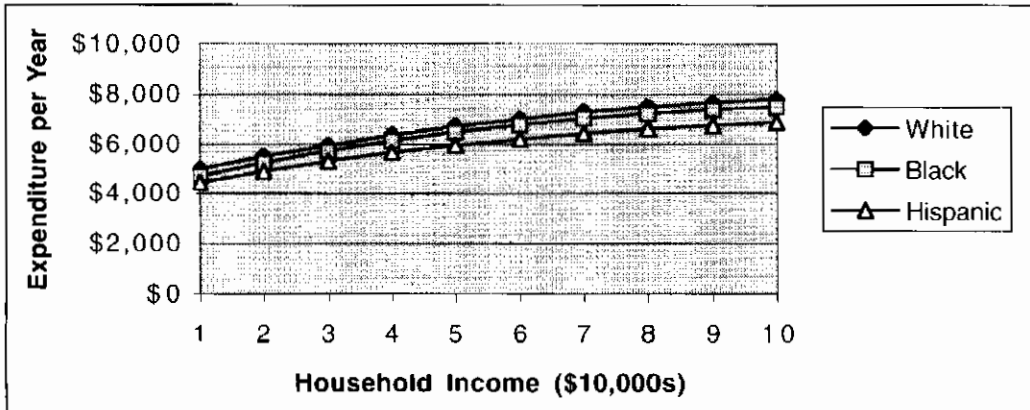
Figure 6 ■ Migrant-renter community investment by race and income.

It is important to remember that Figure 6 is generated using OLS, which means that the lines in Figure 6 reflect the average community expenditures by income and race. Average expenditures will be low if large numbers of minority households live in poor-quality communities. Reexamining Table 4, note that blacks move to the best communities as income rises but the absolute numbers of blacks entering those communities is quite small; similarly, white households live in poor communities, but again those numbers are small.

In Figure 7, we plot the Engel curves for expenditures on structure by renters by race. There is a considerably smaller gap in structure expenditures. At \$50,000 in income, white renters are spending \$6,689 per year on structure while black renters are spending \$6,463 and Hispanics are spending \$5,936. Figures 8 and 9 present Engel curves for community and structure expenditures for owners. These results are similar to the renter results. The gap in community expenditures between white owners and minority owners is considerably larger than the gap in structure expenditures. However, the gap in community expenditures between white and minority households is larger for owners than for renters. At \$50,000 in income, white owners spend 62% more than black owners on community, while white renters spend 44% more than black renters.

variation in quality of life than majority communities, then our Figure 6 underestimates the slope of the minority line. This would mean that our methodology underestimates the size of the investment gap for poor people and overestimates the gap for richer minorities. Taking the residuals from the regression of school math scores on PUMA fixed effects, we regressed the square of the residuals on PUMA racial composition. There is not more variation in math scores within black communities than in white communities, which suggests that black communities are not more heterogenous than white communities.

Figure 7 ■ Migrant-renter structure investment by race and income.



The gaps in community expenditures presented in Figures 6 and 8 are net gaps across all community attributes. For example, black households tend to live in communities with better air quality and closer to the central city, but those communities also have higher crime, poorer quality school and fewer college graduates. In order to identify which attributes are driving the size of the gap, we decompose the gap assuming that air quality, location in the city and distance from the center of the city are the same for all households. With this assumption, the percentage of community residents that are college graduates explains 70% of the gap between community expenditures by white and black renters, differences in school quality measured by math scores explain 18% of the gap, and differences in crime explain 12%.

As discussed in the methodology section, an alternative to examining aggregate community expenditures by demographic group is to examine consumption of individual community attributes by demographic group. In

Figure 8 ■ Migrant-owner community investment by race and income.

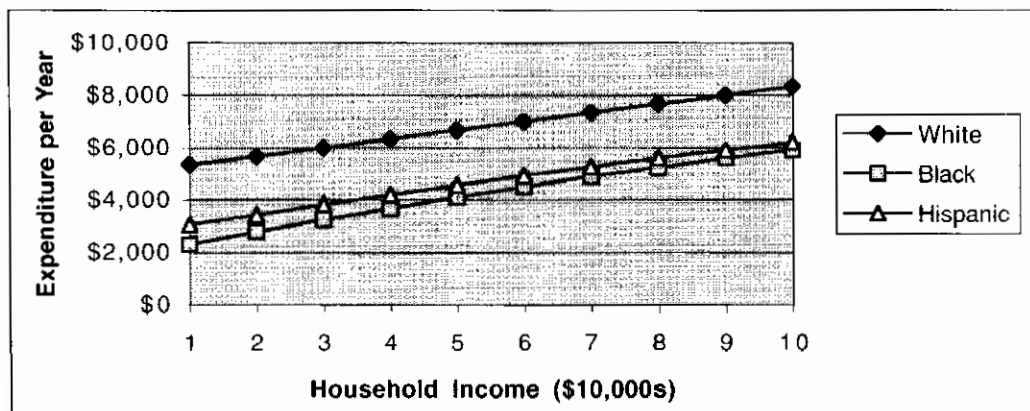
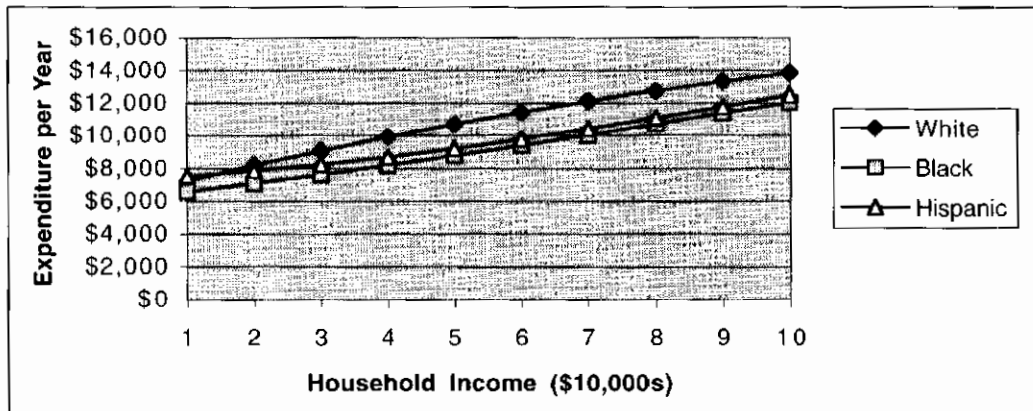


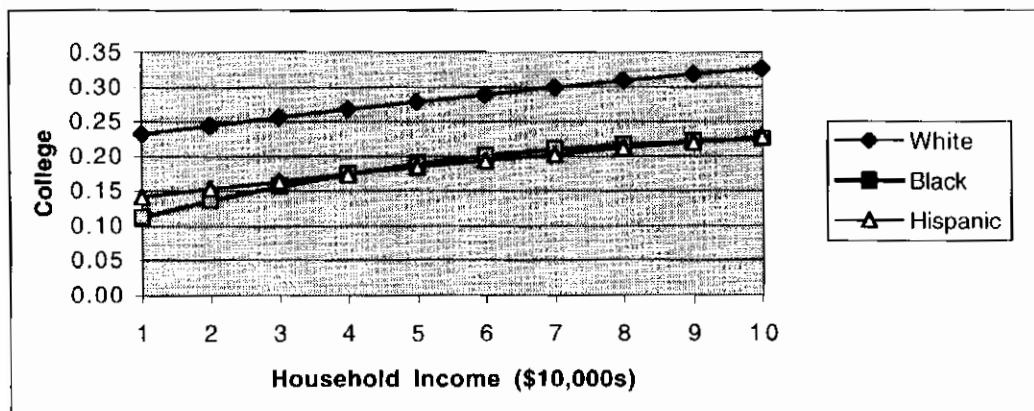
Figure 9 ■ Migrant-owner structure investment by race and income.



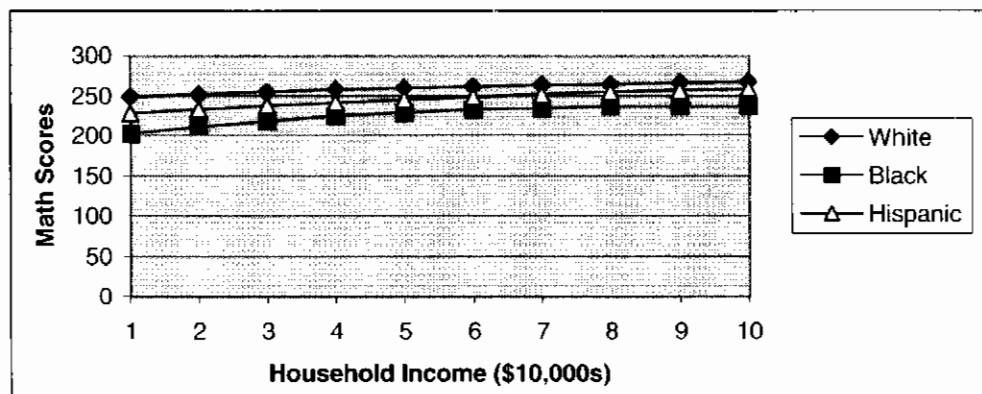
Figures 10 and 11, we present community college-graduate percentages and school test scores by race and income based on Equation (4) for renters.²² The gaps by race as income rises are quite similar to those found with the community expenditure index. For households with \$50,000 in income, white renters live in communities with 47.1% more college graduates than black renters and 51.1% more than Hispanic renters. At \$50,000 in income, white renters live in communities with 13.2% higher math scores than black renters and 5.7% higher than Hispanic renters.

The results presented in this section consistently point to a large difference in community expenditures by race, even controlling for income. This gap may reflect differences in preferences between majority and minority households, but our data do show that as minority income rises minorities choose higher-quality communities. This evidence suggests to us that the

Figure 10 ■ Percentage of college graduates in migrant-renter communities.



²² The estimated equations are not presented here, but are available from the authors.

Figure 11 ■ Migrant-renter community math scores.

gap in community expenditures is unlikely to be explained by differences in preferences. This gap would result if minorities lack information about potential opportunities because they use different resources in their search than majority households. In addition, there may be differences in the importance of social networks between minority and majority households (Carrington, Detragiache and Vishwanath 1996). For example, for foreign-born Hispanics, the presence of other Hispanics who speak the same language and provide a social network may be very important in their location decision.²³ For minority households, there are few communities that offer a significant minority population and high community quality as measured by our community index. If social networks for minority households are based in the minority community, then minority households must choose between networks and community quality. Even for minority households that would choose community quality over networks, the presence of housing-market discrimination would limit further minority access to high-quality majority communities.

In this analysis, we have no explicit test for barriers to accessing high-quality communities for minorities, but we do find evidence that there is a discount in the form of lower rents for living in black and Hispanic areas. Assuming majority and minority households have the same preferences for community investment, the gap could be generated by minorities, who face larger fixed search costs in high-quality communities and receive a discount for living

²³ Looking at the data, we find that 81% of Hispanic households that moved in the last five years were foreign-born, and 26% lived outside of the U.S. five years ago. There is an extensive history literature on the waves of immigration in the late nineteenth and early twentieth century that suggests that many immigrants moved to areas with significant numbers of households from their ethnic group to take advantage of social networks or to be with others who spoke the same language.

in minority areas, rationally substituting to lower-quality communities than they would have in a world without discrimination.

While Census data do allow researchers to document housing expenditures across tenure, structure and community, these data are not rich enough to address the relative importance of social networks, discrimination, tastes and information in generating observed choices. Sorting through these explanations requires detailed data on the housing search process. In particular, there need to be new household surveys which provide information on household structure and community choices as well as information on how households define community quality and their social networks. In addition, more information is needed on how households conduct their search (*e.g.*, reliance on real-estate agents or friends).

It is unlikely that surveying individual households will yield much insight on the presence of housing-market discrimination. While individuals may identify overt forms of discrimination, they may not be aware of the more subtle forms. In fact, accurately measuring discrimination remains an elusive task. In recent years, the most promising research in this area has been based on the audit-pair methodology. However, Heckman (1998) raises serious methodological concerns with this approach. At this point, we believe that the most productive approach to understanding the importance of discrimination in explaining our gap in community expenditures may be to establish the portion of the gap that can be explained by information and social networks. We would interpret any gap that remains as resulting from discrimination.

Conclusions

Community choice is a very important household decision, since it represents an investment in community attributes that can have a significant effect on the quality of life of all household members, particularly influencing the future prospects of children. The results presented in this paper clearly show that investments in community vary substantially by race even when controlling for income, while there is a much smaller gap in expenditures on structure by race. Black and Hispanic households spend considerably less on community than do white households. The spending gaps estimated in this paper are large and robust to different specifications.

The Los Angeles 1990 community gap is likely to be present in other cities, and it is likely to persist over time. While minority segregation has slowly fallen since 1970 (Cutler, Glaeser and Vigdor 1999), minorities are still highly segregated and living in communities that on average feature lower

levels of our community index. This consumption gap should shrink as minority incomes rise over time, discrimination falls or mean educational attainment in minority communities rises. Our results suggest that convergence would be slow due to low propensity for minorities to increase community expenditure as household incomes rise.

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