

Does Sprawl Reduce the Black/White Housing Consumption Gap?

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Abstract

Because unplanned suburban growth imposes social costs such as congestion, pollution, and reduction of open space, antisprawl policies are being adopted in fast-growing metropolitan areas. This article explores one potential benefit of sprawl: It increases housing affordability, which may contribute to reducing the black/white housing consumption gap.

The article uses 1997 American Housing Survey data to measure housing consumption for blacks and whites in metropolitan areas characterized by more and less sprawl. In sprawled areas, black households consume larger units and are more likely to own their homes than black households living in less sprawled areas.

Keywords: Growth management; Housing; Minorities

Introduction

Along every dimension of housing such as size, age, and homeownership rates, there is a black/white consumption gap that has narrowed over time. In 1920, the average homeownership rate for white males was 47.5 percent, while for blacks, it was 24.64 percent. By 1990, this 22.86 percent gap had closed to 17.97 percent, since the white homeownership rate had increased to 74.25 percent and the black homeownership rate had increased to 56.28 percent (Collins and Margo 2001). Relevant factors that contribute to this gap include income differences, accumulation of wealth for the down payment, and discrimination in the mortgage markets and during the search process (Collins and Margo 2001; Duca and Rosenthal 1994; Gyourko, Linneman, and Wachter 1999; Munnell et al. 1996; Turner 1992; Yinger 1995).

Increasing housing affordability could reduce the black/white housing consumption gap. Flat or falling real wages for the less educated over the past 20 years have made the affordability of homeownership a serious issue for many households (Gyourko and Linneman 1993).

Under the banner of "The Costs of Sprawl," academics and the popular press have focused on the negative consequences of suburban growth. For example, sprawl can degrade the quality of life in the center city and the suburbs by increasing center-city poverty and vehicle depen-

dence; congesting suburban roads, schools, and basic services; and threatening open space by reducing farming. But suburban growth may also increase housing affordability.

This article seeks to measure one benefit of sprawl, that it contributes to closing the black/white housing consumption gap, by using 1997 American Housing Survey (AHS) (U.S. Department of Housing and Urban Development [HUD] 2000) data to test the hypothesis that the black/white housing consumption gap is smaller in sprawling areas of the United States. It is important to measure this potential benefit because of the growing backlash against suburban growth.

The next section reports average black/white housing consumption differentials by metropolitan sprawl level. Multivariate regression models of housing consumption are estimated to measure how housing consumption varies in high- and low-sprawl areas. For three measures of housing consumption (number of rooms, unit square footage, and homeownership rates), the black/white consumption gap is found to be smaller in more sprawled areas. The final section of the article explores possible mechanisms by which sprawl could help close the racial housing gap.

Housing consumption by metropolitan area sprawl levels

Microdata from the 1997 wave of the AHS is used to measure black/white housing consumption differentials. This nationally representative data set provides detailed information on the attributes of the housing unit, the family living in it, and its metropolitan area location.

Measuring sprawl is a topic of ongoing popular and academic interest. The measure used in this article is based on the centralization of employment within a metropolitan area. If all of a metropolitan area's employment were located in a 10-mile ring around the central business district (CBD), this would constitute a very low level of sprawl. A larger share of employment outside the 10-mile ring indicates higher levels of sprawl. The locations of the CBDs are drawn from the *1982 Economic Census, Geographic Reference Manual* (U.S. Bureau of the Census 1993). The U.S. Department of Commerce's 1996 ZIP Code Business Patterns data provides information on total employment by ZIP code (see Glaeser and Kahn 2001). ZIP code business patterns data are extracted from the Standard Statistical Establishments List, a file maintained and updated by the Bureau of the Census of all known single and multiestablishment companies. The data source for each ZIP code's distance from the CBD is Chu (2000). The data on each ZIP code's distance from the CBD and its total employment are used to construct the share of jobs outside the 10-mile ring and within 35 miles of the CBD.

Table 1 reports the sprawl rankings for major metropolitan areas. The least sprawled metropolitan areas are Portland (OR), New York City, Anaheim (CA), Denver, and Milwaukee. For example, in the New York City metropolitan area, only 23.2 percent of jobs are located outside the 10-mile ring. The six most sprawled major metropolitan areas are Detroit, Tampa (FL), Oakland (CA), Atlanta, Chicago, and Los Angeles. Looking across table 1, it may be surprising that older metropolitan areas such as Chicago and Philadelphia are slightly more sprawled than Dallas and Houston.¹

Table 1. Sprawl Rankings for Major Metropolitan Areas

Lowest		Highest	
Name	Sprawl Level	Name	Sprawl Level
Portland, OR	0.196	Baltimore	0.462
New York City	0.232	Newark, NJ	0.463
Anaheim, CA	0.300	Kansas City, MO	0.463
Denver	0.313	Washington, DC	0.472
Milwaukee	0.372	Houston	0.509
Miami	0.378	San Diego	0.525
Pittsburgh	0.385	St. Louis	0.588
Minneapolis	0.386	Dallas	0.588
Indianapolis	0.386	Philadelphia	0.611
San Francisco	0.388	Los Angeles	0.628
Cincinnati	0.411	Chicago	0.636
Phoenix	0.425	Atlanta	0.647
Cleveland	0.446	Oakland, CA	0.685
Boston	0.448	Tampa, FL	0.741
Seattle	0.452	Detroit	0.786

Note: Sprawl level is the share of a metropolitan area's jobs that are located outside the inner 10-mile ring.

This article focuses on six measures of housing consumption—number of rooms, unit size (measured in square feet), suburbanization, ownership, suburban ownership, and unit year built—and tests whether the differential between whites and blacks with respect to housing consumption narrows in more sprawled metropolitan areas.

To begin to document the evidence, table 2 reports average housing consumption (1997 sample averages) for whites and blacks. (See columns 1 and 4.) Across all six housing consumption measures, blacks lag behind whites. Relative to the average white household, the average black household consumes 50 percent fewer rooms and 10 percent less living space; it is 24 percentage points less likely to live in the suburbs, 24 percentage points less likely to own a home, and 23 percentage points

¹ There are many ways to rank an area's sprawl level, and creating such rankings is an important area of research. A recent study using a variety of sprawl measures produces a ranking of 13 metropolitan areas similar to the sprawl ranking based on employment suburbanization (see Galster et al. 2000). Two exceptions are Philadelphia and Chicago, which are ranked as "low sprawl" based on their methods.

Table 2. Mean Housing Consumption Differentials by Race and Metropolitan Sprawl Level

Column	Black Head of Household			White Head of Household		
	1	2	3	4	5	6
	All	Low-Sprawl MSA	High-Sprawl MSA	All	Low-Sprawl MSA	High-Sprawl MSA
Rooms	5.066	4.870	5.252	5.533	5.482	5.592
Unit size (square feet)	1755.184	1629.196	1887.771	1949.937	1879.737	2030.654
Suburbanization	0.272	0.214	0.326	0.512	0.417	0.619
Ownership	0.377	0.347	0.405	0.617	0.604	0.632
Suburban ownership	0.122	0.101	0.141	0.354	0.287	0.431
Unit year built	1951	1949	1952	1957	1955	1959

Source: 1997 AHS (HUD 2000). The sample includes all households living in a metropolitan area. *Note:* High-sprawl metropolitan statistical area (MSA) represents the set of areas where the share of jobs outside the 10-mile ring is 44 percent or higher. The metropolitan areas that are not in the high-sprawl set are in the low-sprawl set.

less likely to be a suburban owner. It also lives in a housing unit that is 6 years older.

Columns 2 and 3 report average housing consumption for blacks who live in low-sprawl versus high-sprawl metropolitan areas. High sprawl is defined as those metropolitan areas whose share of jobs outside the 10-mile ring is 44 percent or higher. Relative to the average black household living in a low sprawl area, the average black household in a sprawled metropolitan area consumes a larger housing unit (by 0.4 more rooms), is more likely to live in the suburbs (by 11 percentage points), more likely to own a home (by 6 percentage points), and more likely to be a suburban homeowner (by 4 percentage points).

Also, black households located in sprawled metropolitan areas live in newer housing units. Columns 5 and 6 show white household average housing consumption in low- and high-sprawl areas. Note that unlike black households, white households in sprawl areas do not live in larger housing units. White household suburbanization rates increase by 20 percentage points, home ownership rates by 3 percentage points, and suburban ownership by 15 percentage points. Calculating the double difference [(column 3 – column 2) – (column 6 – column 5)] in housing consumption, we see that blacks make relative progress on rooms, housing unit size, and homeownership rates.

Housing consumption regressions

Table 2 presents housing consumption averages, which implicitly assume that the average person in a low- and a high-sprawl area are similar.

In this section, ordinary least squares (OLS) regressions are estimated to control for demographic differences such as differences in household size and income to study the independent impact of metropolitan area sprawl on housing consumption.

For black households, six separate OLS regressions of equation (1) are estimated.

$$\text{Housing consumption} = \text{region} + B1*\text{demographics} + B2*\text{sprawl} + U \quad (1)$$

In equation (1), region represents four regional dummies; demographics includes the log of household income, the number of adults, the number of children, and the head of household's age and age squared. The log of the metropolitan area's total number of jobs is included as an additional control. U represents the error term. The same set of regressions is estimated separately for white households. The standard errors in all of the regressions are adjusted for metropolitan statistical area (MSA) clustering. Including regional dummies controls for climate and other regional factors.

Six OLS regressions for black households are presented in table 3. Each column reports a separate regression for which the dependent variables are measures of housing consumption: rooms, unit size, suburbanization, ownership, suburban ownership, and unit year built. Specifications 3, 4, and 5 are linear probability models because the dependent variables are dummies. As would be expected, the household head's age, income, and family composition have a statistically significant impact on housing consumption. All else being equal, richer households consume more rooms and larger housing units, and are more likely to live in the suburbs, to be homeowners, to be suburban homeowners, and to own new units. The key coefficients of interest are sprawl and its square. The *F* statistic at the bottom of the table tests the null hypothesis that metropolitan area sprawl has no statistically significant impact on housing consumption. As shown by the *F* statistic for black households, the hypothesis that sprawl does not affect housing consumption is rejected for two of the six housing consumption measures.

Table 4 presents the same set of OLS regressions for white households. While the coefficient estimates are qualitatively similar to estimates for black households, increases in white household income have a larger impact on consumption of rooms, unit square footage, homeownership, and suburban ownership than an equal increase in black household income.

To judge the magnitude of the impact of sprawl on housing consumption, the regression estimates of equation (1) presented in tables 3 and 4 are used to predict housing consumption for observationally identical black and white households. The demographic variables are set to equal

Table 3. **Housing Consumption Regressions for Black Households**

Specification	Dependent Variable					
	1	2	3	4	5	6
	Rooms	Unit Size (Square Feet)	Suburban- ization	Ownership	Suburban Ownership	Unit Year Built
	Coefficient (Standard error)					
Age	0.062 (0.010)	18.178 (14.158)	-0.001 (0.003)	0.018 (0.003)	0.009 (0.003)	-0.151 (0.161)
Age squared	-0.000 (0.000)	-0.061 (0.135)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.001)
Log of income	0.273 (0.038)	146.733 (38.397)	0.058 (0.011)	0.100 (0.014)	0.048 (0.007)	2.234 (0.491)
Number of adults	0.519 (0.056)	160.390 (36.209)	-0.014 (0.010)	0.071 (0.011)	0.006 (0.007)	-0.699 (0.507)
Number of children	0.389 (0.039)	85.783 (30.018)	-0.000 (0.009)	0.018 (0.006)	0.011 (0.004)	-0.446 (0.434)
Log of MSA total jobs	-0.186 (0.070)	6.721 (50.436)	0.015 (0.038)	-0.047 (0.016)	0.006 (0.016)	-0.224 (0.906)
Sprawl level	2.729 (1.054)	981.048 (598.602)	0.645 (0.572)	-0.334 (0.259)	0.163 (0.276)	-22.146 (16.194)
Sprawl level squared	-1.936 (0.967)	-696.275 (599.053)	-0.550 (0.589)	0.710 (0.242)	-0.113 (0.295)	18.044 (16.854)
Constant	0.914 (0.974)	-1218.459 (723.676)	-0.576 (0.512)	-0.732 (0.262)	-0.743 (0.269)	1946.022 (11.745)
F test	3.79*	1.90	0.82	9.05**	0.47	1.23
R ²	0.273	0.152	0.064	0.242	0.069	0.213
Observations	2,484	908	2,484	2,453	2,453	2,484

Note: This table reports OLS estimates of equation (1). Standard errors are presented in parentheses. In each of the regressions, regional dummies are included. The regressions are weighted, and the standard errors are adjusted for MSA clustering. The *F* test checks the hypothesis that the sprawl measure and its square are jointly statistically insignificant. For the *F* tests, * indicates statistical significance at the 5 percent level, and ** indicates statistical significance at the 1 percent level. Specifications 3 through 5 are linear probability models.

a 40-year-old head of household with two adults and two children and an annual household income of \$35,000. For this standardized household, housing consumption is predicted using the coefficient estimates from table 3 for black households and the coefficient estimates from table 4 for white households.

Table 5 reports predicted housing consumption for identical households living in a metropolitan area where 20 percent and 60 percent of the jobs are outside the 10-mile ring. Black households in the sprawled metropolitan area consume more rooms and more housing space and are more likely to own and live in the suburbs than the same black household living in a nonsprawled metropolitan area. Sprawl helps close the black/white housing gap for rooms, unit size in square feet, and ownership propensity.

Table 4. **Housing Consumption Regressions for White Households**

Specification	Dependent Variable					
	1	2	3	4	5	6
	Rooms	Unit Size (Square Feet)	Suburban- ization	Ownership	Suburban Ownership	Unit Year Built
	Coefficient (Standard error)					
Age	0.118 (0.006)	43.996 (5.081)	0.008 (0.002)	0.032 (0.001)	0.021 (0.002)	0.043 (0.077)
Age squared	-0.001 (0.000)	-0.322 (0.047)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.001 (0.001)
Log of income	0.492 (0.040)	246.147 (19.655)	0.042 (0.007)	0.129 (0.008)	0.087 (0.007)	2.036 (0.347)
Number of adults	0.490 (0.039)	75.604 (14.104)	0.023 (0.007)	0.057 (0.007)	0.047 (0.006)	-0.964 (0.312)
Number of children	0.397 (0.030)	81.505 (13.434)	0.014 (0.005)	0.050 (0.005)	0.036 (0.006)	0.179 (0.255)
Log of MSA total jobs	-0.236 (0.069)	18.210 (26.217)	-0.028 (0.040)	-0.067 (0.015)	-0.033 (0.028)	-1.985 (0.883)
Sprawl level	2.857 (0.844)	719.093 (367.752)	1.168 (0.533)	0.297 (0.187)	0.919 (0.371)	-3.704 (15.678)
Sprawl level squared	-2.750 (0.827)	-734.647 (435.513)	-0.662 (0.536)	-0.119 (0.189)	-0.569 (0.373)	10.490 (17.208)
Constant	-1.549 (0.982)	-2594.652 (370.684)	-0.187 (0.471)	-1.057 (0.198)	-1.126 (0.366)	1963.864 (11.676)
<i>F</i> test	5.84**	2.02	5.52**	3.62*	6.17**	1.09
<i>R</i> ²	0.295	0.146	0.072	0.275	0.155	0.125
Observations	12,322	6,853	12,322	12,179	12,179	12,322

Note: This table reports OLS estimates of equation (1). Standard errors are presented in parentheses. In each of the regressions, regional dummies are included. The regressions are weighted, and the standard errors are adjusted for MSA clustering. The *F* test checks the hypothesis that the sprawl measure and its square are jointly statistically insignificant. For the *F* tests, * indicates statistical significance at the 5 percent level, and ** indicates statistical significance at the 1 percent level. Specifications 3 through 5 are linear probability models.

Table 5. **Predicted Housing Consumption by Sprawl Level**

	Black Household Consumption		White Household Consumption	
	20% Sprawl Level	60% Sprawl Level	20% Sprawl Level	60% Sprawl Level
Rooms	5.693	6.165	6.208	6.471
Unit size (square feet)	1689.915	1859.527	1880.669	1933.219
Suburbanization	0.245	0.327	0.411	0.666
Ownership	0.452	0.545	0.678	0.758
Suburban ownership	0.141	0.170	0.314	0.500
Unit year built	1955	1951	1959	1961

Note: This table uses the regression coefficient estimates presented in tables 3 and 4 to predict housing consumption. Sprawl level is the share of metropolitan-area jobs located outside the inner 10-mile ring. The predictions are based on a household featuring two adults and two children for which the head of household's age is 40, the household income is \$35,000, and there are 250,000 jobs in the metropolitan area.

Why does sprawl reduce the housing consumption gap?

One reason sprawl reduces the black/white gap in unit size and ownership rates is that increased fringe urbanization leads to a greater supply of land for development, which increases affordability. A second explanation is that, as jobs move to the fringe in older sprawling metropolitan areas such as Detroit and Philadelphia, the durable inner-city housing stock becomes even cheaper. These older homes are not near suburban jobs. In 1996, the median home price in center-city Philadelphia was roughly \$45,000. Black households are overrepresented in the center city and face less housing market competition from whites who tend to work in the suburbs.

Suburban growth can increase homeownership among blacks because they move to the suburban fringe or because whites move into the newest housing constructed at the fringe, while the homes and communities they move from are filled by minority households. This “musical chairs” would lead to a greater concentration of blacks in the older inner-ring suburbs than at the suburban fringe. By definition, in sprawling areas, new communities are being formed. In such communities, there are no “incumbents.” It is also possible that such communities feature less concern on the part of residents about racial tipping.

Conclusion

Explanations for racial differences in housing consumption often focus on key household attributes such as income and wealth (Gyourko and Linneman 1997; Gyourko, Linneman, and Wachter 1999; Wachter and Megbolugbe 1992). This article has explored another relevant variable. Black households living in sprawled metropolitan areas live in larger housing units and are more likely to own a home than observationally identical black households in less sprawled areas. In addition, as the metropolitan area’s sprawl level increases, the black/white housing gap closes for these measures of housing. Sprawl is likely to increase affordability in both the suburbs and the center cities. Increased affordability should lead to increased consumption. This unintended consequence of sprawl merits future research.

Affordability is likely to decrease in the presence of more antisprawl legislation. Such rules reduce the supply of new housing, which in turn raises the price of homes (Abbott 1997; Fischel 1990, 1997; Katz and Rosen 1987). This article has documented that such policies will have distributional consequences by limiting progress in minority housing consumption.

While housing opportunities for blacks may improve with sprawl, the quality of life for minorities could decline in sprawling areas if suburban

growth leads to less access to jobs and increases income segregation. If suburban employment growth is fueled by center-city businesses relocating to the suburbs, then employment sprawl will exacerbate spatial mismatch problems and thus lower employment opportunities for minorities who live in the center city (Kain 1992).

Whether employment sprawl increases or decreases the quality of life for minority urban residents depends on how such households trade off gains in housing consumption versus losses in employment opportunity. The recent revival of center cities as tourist and cultural hubs offers the possibility that minority households will have the opportunity to purchase cheap urban housing while working in the downtown service sector. Under this scenario, employment sprawl would improve housing opportunities without lowering opportunities for minority employment. Given the ongoing growth of suburban employment in newly formed edge cities, future research should investigate whether minority employment opportunities have been diminished in sprawling areas.

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References

- Abbott, Carl. 1997. The Portland Region: Where City and Suburbs Talk to Each Other—and Often Agree. *Housing Policy Debate* 8(1):11–51.
- Chu, Chenghuan. 2000. Employment Decentralization. Undergraduate thesis. Harvard University, Department of Economics.
- Collins, William, and Robert Margo. 2001. Race and Home Ownership: A Century-Long View. *Explorations in Economic History*, forthcoming.
- Duca, John, and Stuart Rosenthal. 1994. Borrowing Constraints and Access to Owner-Occupied Housing. *Regional Science and Urban Economics* 24(3):301–22.
- Fischel, William. 1990. *Do Growth Controls Matter?* Cambridge, MA: Lincoln Institute of Land Policy.
- Fischel, William. 1997. Comment on Carl Abbott's "The Portland Region: Where City and Suburbs Talk to Each Other—and Often Agree." *Housing Policy Debate* 8(1):65–73.
- Galster, George, Royce Hanson, Hal Wolman, Stephen Coleman, and Jason Freihage. 2000. Wrestling Sprawl to the Ground: Defining and Measuring an Elusive Concept. Paper presented at the Fannie Mae Foundation Fair Growth Conference, November, Atlanta.

Glaeser, Edward, and Matthew Kahn. 2001. Decentralized Employment and the Transformation of the American City. In *Brookings-Wharton Papers on Urban Affairs*, Vol. 2, ed. Janet Rothenberg Pack and William Gale. Washington, DC: Brookings Institution.

Gyourko, Joseph, and Peter Linneman. 1993. The Affordability of the American Dream: An Examination of the Last 30 Years. *Journal of Housing Research* 4(1):39–72.

Gyourko, Joseph, and Peter Linneman. 1997. The Changing Influences of Education, Income, Family Structure, and Race on Homeownership by Age over Time. *Journal of Housing Research* 8(1):1–26.

Gyourko, Joseph, Peter Linneman, and Susan Wachter. 1999. Analyzing the Relationships among Race, Wealth, and Home Ownership in America. *Journal of Housing Economics* 8(2):63–89.

Kain, John. 1992. The Spatial Mismatch Hypothesis: Three Decades Later. *Housing Policy Debate* 3(2):371–460.

Katz, Lawrence, and Kenneth Rosen. 1987. The Interjurisdictional Effects of Growth Controls on Housing Prices. *Journal of Law and Economics* 30(1):149–60.

Munnell, Alicia, Geoffrey M. B. Tootell, Lynne E. Browne, and James McEneaney. 1996. Mortgage Lending in Boston: Interpreting HMDA Data. *American Economic Review* 86(1):25–53.

Turner, Margery Austin. 1992. Discrimination in Urban Housing Markets: Lessons from Fair Housing Audits. *Housing Policy Debate* 3(2):185–215.

U.S. Bureau of the Census. 1993. *1982 Economic Census, Geographic Reference Manual*. Washington, DC.

U.S. Department of Housing and Urban Development. 2000. *American Housing Survey*. World Wide Web page <<http://www.huduser.org:80/datasets/ahs.html>>.

Wachter, Susan M., and Isaac Megbolugbe. 1992. Racial and Ethnic Disparities in Homeownership. *Housing Policy Debate* 3(2):333–70.

Yinger, John. 1995. *Closed Doors, Opportunities Lost: The Continuing Cost of Housing Discrimination*. New York: Russell Sage Foundation.