Debunking the Exurban Myth: A Comparison of Suburban Households

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Abstract

As American cities spill over their traditional boundaries into "exurbia," the debate about whether this new growth is substantively different from what preceded is an important one. We disagree with the idea that the counterurbanization the United States is experiencing represents a dramatic break from previous growth patterns.

Using parametric and nonparametric analysis, we examine whether or not the behavioral patterns and demographic characteristics of exurbanites differ from those of suburbanites. Is exurbanization really different from suburbanization and are exurbanites really different from suburbanites? Our research shows that the answer is no. Exurbia should not be defined separately from suburbia. Rather, the development on the metropolitan fringe is simply the latest incarnation of the continued suburbanization of American cities.

Key Words: Demographics; Location; Suburban

Introduction

The United States recently has experienced unprecedented counterurbanization. The 1970s saw more people moving into nonmetropolitan counties than to metropolitan counties for the first time ever (Berry and Gillard 1977; Vining et al. 1983; Long and DeAre 1988),[1] fueling what has been termed the "population turnaround" or the "rural renaissance." Despite a lull in the 1980s, the counterurbanization trend has regained momentum (Johnson and Beale 1998).

There is ongoing debate over whether the "population turnaround" represents the continuation of the same urban forces that shaped our cities in the postwar era (suburbanization) or a completely new set of forces resulting in a totally new metropolitan growth pattern (exurbanization). Those who claim that exurbanization is completely different from surburbanization rest their belief on two ten-

[1] See Nelson and Sanchez (1997) and Nelson (1992) for reviews.

ets: that exurbanites differ from suburbanites on key demographic characteristics, and that exurbs represent a "clean break" in the pattern of urbanization as it spreads from the metropolitan core (Vining et al. 1983). Exurbia has been a topic of concern since the 1950s (Spectorsky 1955). Early characterizations of exurbia focused on their supposedly affluent residents' lifestyle. In fact, the *American Heritage Dictionary* defines exurbs as a "region lying beyond the suburbs of a city, inhabited principally by those who are well-to-do" (1982). The myth of exurbia is that it is very distinct from suburbia. Our findings debunk this myth.

If exurbia were completely different from suburbia, conventional theory about urban form would have to be rethought. This includes the Alonso-Muth-Mills theory of urban form, which features a single-centered urban structure containing primary economic activities, surrounded by concentric rings of residential settlement that are determined by microeconomic constraints (Alonso 1960; Mills 1972; Muth 1969). In this theory, utility maximization is at the root of household location decision making and general equilibria. Income elasticities for land and the cost of commuting distinguish income classes based on location, with higher-income households choosing to live away from central cities and lower-income ones near or within central cities. As distance from the central business district (CBD) increases, accessibility decreases and transportation costs increase. Land rents near the CBD are highest because transportation costs are lowest and accessibility is maximized. In this monocentric model, proximity to the origin means nearness to economic activity and the point at which economic profit (income) is most efficiently obtained. The model allows conceptually for secondary clusters or nodes on the urban landscape, but their internal structure and density are determined, in large part, by their distance from the center. Thus, even in a polycentric city, the center remains a major variable in determining overall urban form (Lang 1994). The model predicts that land rents decrease and transportation costs increase monotonically but not necessarily at constant rates. Income is then the sum of land rent, transportation cost, and a composite good encompassing all other household needs.

Vining et al. (1983) argue that the Alonso-Muth-Mills model is now inoperative in explaining metropolitan land use because new nonmetropolitan growth represents a clean break in the process of urbanization as it spreads from the regional core. Our findings, however, show that the exurbs are not demographically distinct from the rest of suburbia and in that way also do not represent a clean break. Therefore the Alonso-Muth-Mills model stands.

Regardless of whether one believes the growth in nonmetropolitan counties is surburbanization or exurbanization, the growth itself

cannot be denied. When we look at only stable counties (metropolitan and nonmetropolitan counties that remained unchanged in status since the 1960 census), trends become evident. During the 1960s, metropolitan counties attracted population to a far greater extent than nonmetropolitan counties. The trend reversed in the 1970s, when nonmetropolitan counties grew at rates comparable to or faster than metropolitan counties.

The deconcentration of population exists because of economic, technological, cultural, and public policy factors (Nelson 1992). First, jobs have continued to move outward from central cities and first-tier suburbs to the suburban employment ring of metropolitan areas (Cervero 1986; Garreau 1991). The deconcentration also is fueled by unprecedented relocation of manufacturing jobs from urban areas to the metropolitan fringe, a process one of us (Nelson 1994) defined as "exurban industrialization." The result is that formerly rural areas have become accessible to workers looking for new places to live (Dueker et al. 1983; Gordon, Kumar, and Richardson 1989).

Significant improvements in technology have made population and employment deconcentration possible. Most people appreciate that new technologies such as the personal computer, cellular telephones, satellite linkages, and the Internet allow millions of people to live and work practically anywhere (U.S. Office of Technology Assessment 1995). What many may not appreciate as deeply is that advances in "property service" technology further expand household location options (Nelson 1989). Those advances include more flexible on-site wastewater (sewerage) treatment systems and improved water supply, storage, and treatment, including reverse osmosis.

Facilitating the "rural renaissance" are a variety of public policies affecting highways (Muller 1976), home mortgage programs and tax subsidies (Nelson 1998), underpriced fossil fuels (U.S. Office of Technology Assessment 1995), and disaster insurance or relief that enables development of hazardous and sensitive landscapes (Burby and Dalton 1994). The implicit urban policy of the United States favors development of outlying areas over reuse, redevelopment, or rehabilitation of central areas (Bourne 1980).

Economic and technological changes make living farther out possible, but they do not explain households' underlying desire to do so. What may drive households farther out is cultural antiurbanism characterized by the Jeffersonian "gentleman farmer" ideal (Fisher and Mitchelson 1981; Spectorsky 1955). While households may wish to escape to the rural landscape, many also are motivated simply to escape from the noise, congestion, pollution, microclimatic condi-

tions, ethnic and racial diversity, and crime associated with urban areas (Jackson 1985; Richardson 1977; Yamada 1972).

The question is, does this new urban form represent a fundamental shift in the way American cities are growing? After analyzing census data over time, Long and Nucci call into question the usefulness of conventional urban form theory to explain this phenomenon. Using the Hoover index to compare changes in population growth, Long and Nucci (1997) report that the population deconcentration we are witnessing signals a distinctly different urban form. They believe exurbia to be completely different from suburbia. Their analysis improves on prior studies of population shifts by comparing three categories of counties: metropolitan and nonmetropolitan counties originally classified and remaining as such after the 1960 census and "crossover" counties reclassified from nonmetropolitan to metropolitan status following the 1970, 1980, and 1990 censuses. Table 1 summarizes their work.

Our research shows, however, that life in exurbia really isn't much different from life in suburbia. Distinguishing the two is not justified. There are two major problems with the clean break literature. First, using census data to demarcate exurbia is limited in usefulness. Second, proponents of exurbia are asking the wrong research questions. We ask *why* people moved to the metropolitan fringe, rather than asking *how many* people moved there.

The U.S. Bureau of the Census divides landscapes into the following categories: urban and nonurban areas, and metropolitan and

Table 1. **Population Growth Rates among Metropolitan, Nonmetropolitan, and Crossover Counties**

Unit of Measure	United States	Metropolitan[a]	Nonmetropolitan[b]	Crossover[c]
Number of counties	3,083	403	2,268	412
Annualized change in population (percent)				
1960 to 1970	1.26	1.52	0.19	1.96
1970 to 1980	1.08	0.79	1.22	2.33
1980 to 1990	0.93	0.99	0.25	1.70
1990 to 1994	1.08	0.97	0.89	1.70

Source: Adapted from Long and Nucci (1997).
[a]Classified as metropolitan after the 1960 census and remained such through the 1990 census.
[b]Classified as nonmetropolitan after the 1960 census and remained such through the 1990 census.
[c]Changed from nonmetropolitan to metropolitan following the 1970, 1980, or 1990 censuses.

nonmetropolitan counties. Urban areas are those with more than 1,000 persons per square mile; nonurban areas have fewer. (Urbanized areas can be found in rural areas and nonurbanized areas can be found in cities.) Metropolitan counties either have central cities (usually with populations larger than 50,000) or are tied through commuting patterns to central cities. Nonmetropolitan counties are everything else.

To our knowledge, all studies supporting the clean break hypothesis are based on the simple dichotomy between metropolitan and nonmetropolitan counties, as defined by the Census Bureau. Long and Nucci add the element of changing metropolitan status over time ("crossover" counties) but their work remains tied to the metropolitan-nonmetropolitan dichotomy. In our view, the clean break cannot be based on this dichotomy because it is too crude. If a household moves to the next county out, and that county happens to be classified as nonmetropolitan, is that household automatically different from one choosing to locate closer in? In addition, while Nucci and Long (1995) recognize that much of the population deconcentration is attributable simply to the spreading out of metropolitan counties into nearby nonmetropolitan counties, they still come to the conclusion that this "spillover" is somehow a clean break from earlier growth.

We bring the reader's attention to Long and Nucci's (1997) crossover counties, those that changed metropolitan status since the 1960s. Many are obviously urban areas that simply grew large enough to be classified as metropolitan. The number of metropolitan statistical areas (MSAs) has nearly doubled since 1960. For example, the classification of Ventura County, California, as metropolitan after the 1970 census (1997 population of 744,211) is attributable mostly to spillover from nearby Los Angeles County (1997 population of 9,206,426). Numerous crossover counties always have been urban centers but for lack of population size were not recognized as metropolitan until censuses after 1960.

Literature supporting the clean break hypothesis is based almost exclusively on analyzing population trends over time, not on underlying socioeconomic or behavioral factors. It would be better if we knew something about *who* moved, *how far away* from work they moved, and *what* they bought in their housing bundle. In our view, a clean break can exist only if there are fundamental differences in the socioeconomic and location behavior between households choosing to live in one landscape over another. Our research uses parametric and nonparametric techniques to examine whether or not

the behavioral patterns and demographic characteristics of exurbanites are different from suburbanites.

Is exurbanization really different from suburbanization and are exurbanites really different from suburbanites? Our research shows that the answer is no—there is no significant difference between the two groups. Therefore, exurbia should not be defined separately from suburbia. Rather, the development on the metropolitan fringe is simply the latest incarnation of the continued suburbanization of American cities. The following discussion summarizes our research methods and findings.

Data

Data for our analysis come from the American Housing Survey (AHS). Since 1982, every two years the AHS interviews 50,000 to 80,000 households nationally about their socioeconomic characteristics, housing attributes, and reasons for choosing where they live. The AHS also interviews 3,000 to 15,000 households in 44 MSAs in batches of 11 MSAs approximately every four years. The AHS attaches a geographic identifier to each respondent's record that is based mostly on the concentric development pattern reported by urban ecologists in the 1920s (Burgess 1925). Those geocodes allowed us to differentiate respondents clearly by suburban and exurban landscapes (see Nelson and Sanchez 1997). This allows us to differentiate respondents by suburban and exurban location within metropolitan areas with some degree of confidence.[2]

Because commuting behavior is a key element of our work, we need data at the household level on distance to work in time and miles.

[2] We determined that respondents from suburban and exurban landscapes (as we defined them from the national and metropolitan surveys) were similar between groups. This allowed us to merge both surveys where possible. (Because of differences in geocoding respondents between the national and metropolitan surveys, we were concerned that exurbanites and suburbanites from the national survey would be different from those in the metropolitan surveys. We found no statistically significant differences in income and commuting among exurban and suburban respondents from either survey. For this reason, we were confident in combining national and metropolitan respondents wherever the national and metropolitan surveys allowed us to address a question.) In some instances, such as in comparing the occupations of exurban and suburban recent-mover households, only the national survey provided necessary data. Using only recent movers (those who had moved to their present home in the previous five years), the national sample provided 6,933 suburban respondents and 1,889 exurban respondents. The metropolitan samples provided 12,619 suburban respondents and 7,119 exurban respondents. In many analyses, these household groups were combined to provide pools of 19,552 suburban respondents and 9,008 exurban respondents. The AHS allows for far more refined analysis than the simplistic urban-rural, metropolitan-nonmetropolitan dichotomies of the census.

The census reports only mode and time to work by the principal wage earner. The Nationwide Personal Transportation Survey (NPTS) (1969, 1978, 1983, 1990) omits many housing attributes and is not compatible with the AHS (although the 1995 NPTS is much improved over earlier versions). Fortunately for us, the AHS includes data on commuting behavior for two survey years: the national sample for 1984 and 22 MSA samples for 1983 and 1984. Unfortunately, it has not included such data since then.

Our research sought to determine whether suburban and exurban households are distinguished from each other by more than residential site location. After all, the rise of multinucleated urban forms that complicate urban fields could mean that exurbanites are merely the next succession of suburbanites and that exurbs are nothing more than the suburbs of the suburbs.[3] Our analysis examined these two household types in terms of income, composition, commuting behavior, occupation, preference for residential space, and housing consumption, especially as they relate to the Alonso-Muth-Mills model of urban form. A substantial deviation from this model would suggest that exurban households represent a departure from the established theory of urban form and that a clean break may exist. We applied nonparametric and parametric analyses to address this issue. Many nonparametric analyses included all MSA respondents but some analyses used only one group because of the way in which questions were asked. The parametric analysis is applied only to the national pool of respondents.

Nonparametric evaluation

Our nonparametric evaluation applied descriptive, chi-square difference in means, and analysis of variance to four sets of hypotheses about household characteristics, occupations, employment accessibility, and housing location (residence) characteristics (see table 2). We applied cluster analysis to further assess whether households cluster based on a priori expectations (see table 3).

Hypothesis set 1: household characteristics. Literature suggests that exurban households will have more traditional family compositions and be younger than suburban households, thus characterizing exurbia as a family-oriented haven from urban and suburban living. (See Nelson and Sanchez 1997 for an extensive review.) On the other hand, among the tradeoffs that households make, household size must be balanced with other factors related to overall expenditures. Household size is typically related to household income

[3] Some studies view suburbanization as a process of population redistribution without explaining disaggregate household behavior or preferences (Grubb 1982).

Table 2. **Summary of Descriptive and Nonparametric Hypothesis Tests**

Hypothesis	Statistically Significant	Literature Consistency	Theoretical Departure
Hypothesis set 1: household characteristics of exurbanites will differ from suburbanites based on			
Household composition, child status	Yes	Yes	No
Age of household head	No	No	No
Household size	Yes	Yes	No
Household income	No	No	No
Hypothesis set 2: exurbanites who commute will differ from suburbanites in occupational mix	Yes	Yes	No
Hypothesis set 3: workplace accessibility of exurbanites will differ from suburbanites based on			
Remote, noncentral work locations	No	No	No
Commuting distance	Yes	Yes	No
Commuting time	Yes	No	No
Variable work places	No	No	—
Home-based work	Yes	Yes	—
Multiple wage earners	Inconsequential	No	No
Flexible work schedules	Yes	Yes	—
Hypothesis set 4: housing budgets of exurbanites will differ from suburbanites based on			
Lot size	Yes	Yes	No
House size	Yes	Yes	No
Housing budgets	Comparable	No	No

Notes: "Inconsequential" means there is a statistically significant difference ($p < 0.05$) but the numerical difference is slight, with less than two percentage points separating suburban and exurban households. "Comparable" means there was no statistical test but the descriptive outcomes are essentially identical. In this case, the suburban housing budget was 45.5 percent and the exurban budget was 45.8 percent of household income.
"—" indicates that conventional theory does not directly address this issue becuase it assumes all workers work at a fixed location outside the home.

Table 3. **Summary Cluster Analysis Results**

Cluster and Characterization	Income	Persons Per Household	House Size	Lot Size	Commute Time
Suburban professional	AA	AA	AA	BA	A
Suburban fringe/exurban, dual wage earner/professional	AA	A	AA	AA	AA
Suburban fringe/exurban, nonprofessional or single worker	A	A	BA	BA	AA
Inner-suburban, nonprofessional	BA	A	BA	A	BA

Note: AA = above average, A = average, BA = below average.

and it seems reasonable that larger families with lower incomes will locate closer to urban centers unless employment location is ubiquitous, in which case exurban households could be larger than suburban ones. Conventional location theory predicts that households with higher incomes will locate farther from the CBD than lower-income households. Any savings in land rent realized by exurban households is offset by high transportation costs because exurbanites must commute farther. We tested four related hypotheses with respect to suburban households:

1. Exurban households are more likely to be more traditional in household composition, with greater proportions of married couples and children but lesser proportions of single-parent households and households without children, than suburban households.

2. Exurban household heads will be younger.

3. Exurban households will have larger families.

4. Exurban households will have higher household incomes.

Although we found that exurbanites differed from suburbanites in household composition and household size, this difference is expected, based on the conventional theory of urban form. In other respects, there were no statistically meaningful differences.

Hypothesis set 2: occupations of workers. Studies by Dueker et al. (1983) and Davis, Nelson, and Dueker (1994) suggest that exurban households will tend to cluster around the professions and skilled blue collar occupations. By comparison, suburban households will tend to cluster around other blue collar, managerial, and service oc-

cupations. Conventional urban form theory also predicts that those with more flexibility in arranging work schedules or workplaces, such as the professions and skilled blue collar labor, have the luxury of commuting during off-peak hours or working in noncentral locations and therefore can locate in the exurbs. We tested the hypothesis that exurban households are more likely than suburban households to have jobs clustered in the professional and high-skill blue collar occupations and less likely to have jobs clustered in the technical, managerial, service, and low-skill blue collar occupations. Our analysis confirmed a statistically different mix of occupations, but in ways that are expected from conventional urban form theory.

Hypothesis set 3: employment accessibility. Literature suggests that exurban locations attract a different mix of households based on employment accessibility than suburban households (for review, see Nelson 1992). Exurban wage earners should tend to work in remote locations (such as traveling sales) or noncentral locations (such as jobs in or near exurbia). Exurban households also will be less likely than suburban households to have more than one wage earner and to have more than one worker who commutes (Gordon, Kumar, and Richardson 1989; Johnston-Anumonwo 1992; Singell and Lillydahl 1986; White 1986, 1988). Those who commute will use strategies such as off-peak commuting or flextime to offset longer distances to employment. Because of their relative isolation, exurban households will tend to have more members working at home than suburban households. In the context of conventional location theory, the more dependent a household is on central workplace locations and normal business hours, the closer it will be to the CBD. We tested seven hypotheses relating to employment accessibility with respect to suburban households:

1. Exurban workers will tend to have more remote or noncentral work locations.

2. Exurban commuters will commute longer distances.

3. Exurban commuters will have longer commute times.

4. Exurban workers will tend to have more variable workplaces.

5. Exurban households will have a higher share of workers who do not commute (work at home).

6. Exurban households will be less likely to have more than one wage earner.

7. Exurban households will use more flexible work schedules.

For hypotheses on remote/noncentral work locations, variable workplaces, and multiple wage earners, we found very little or no statistically significant differences between exurban and suburban households. More exurbanites than suburbanites worked at home but more suburbanites enjoyed flexible work schedules. In both cases, differences were small, albeit statistically significant. Differences in distance to work are statistically significant but this does not undermine urban form theory. Some prior work has found that although exurbanites may travel longer distances, their travel times are comparable to those of suburbanites (see Dueker et al. 1983), but in our study we find travel time to be higher among exurbanites. This is not inconsistent with urban form theory.

Hypothesis set 4: residence characteristics. Literature indicates that the housing characteristics of exurban residences should be unique. Because of the tradeoff between accessibility and leisure time for residential space, exurban households will be able to afford larger lots but smaller homes than suburbanites. Exurbanites should pay more for location (defined as the bundle of land, housing, and services) and direct commuting costs (vehicle, fuel, maintenance, and insurance) than do suburbanites. We tested the hypotheses that exurban residences will tend to have (1) larger lots, (2) smaller homes, and (3) higher location expenditures than suburban households. Our analysis confirmed the first two hypotheses, which are consistent with conventional urban form theory, but not the third. The key question here is whether housing and location budgets differ; it turns out they do not. Suburbanites devote about 45.5 percent of their total household budget to housing and location while exurbanites spend 45.8 percent. We find little basis to suggest that conventional urban form theory is seriously challenged.

Hypothesis set 5: clustering. The clustering of household types within urban subareas is rarely considered in urban location analyses. Earlier research has suggested that exurban households cluster in both lower and higher income groups, reflecting a life cycle and occupational classes (Davis, Nelson, and Dueker 1994; Dueker et al. 1983). The same should be expected for suburban households. If exurbia exists as a landscape settled by households distinguishable from suburbanites, cluster analysis should reveal those distinctions based on income, household size, house size, lot size, and commuting. We tested the hypothesis that exurban and suburban households cluster based on such factors.

Analysis identified four primary clusters of households. To compare them, we examined the mean values of household income, persons per household, house size, lot size, and commute time for each cluster. Table 3 presents the results of those comparisons. The nature of each cluster is summarized here.

1. *Suburban professional*. Households with above-average incomes, household size, and house size; average commute time; and below-average lot size.

2. *Suburban fringe/exurban, dual wage earner/professional*. Households with above-average incomes, house size, lot size, and commute times and average household size.

3. *Suburban fringe/exurban, nonprofessional or single worker*. Households with above-average commute times, average incomes and household size, and below-average house size and lot size.

4. *Inner-suburban, nonprofessional*. Households with average household size and lot size but below-average income, house size, and commute time.

We found that suburban and exurban geographic areas are not distinctly different from each other. Instead, households with similar characteristics and housing preferences are dispersed across the landscape. Residential location appears to be more a function of the interactive effects of income, household composition, and expenditure tradeoffs than simply a function of income or proximity to employment. Generally speaking, our cluster results are reasonably similar to those constructed by Claritas (see Lang, Hughes, and Danielsen 1997).

Summary findings. Nonparametric analysis does not find a substantial deviation in household characteristics based on evaluation of various hypotheses. In general, and with very few exceptions, the weight of the evidence does not support the view that exurbia is a fundamentally new urban form. Instead, exurbanization appears to be nothing more than an extension of suburbanizing forces.

Parametric analysis

We now test for the presence of a clean break using parametric analysis. If there is a clean break, exurban and suburban households should be segmented spatially in their housing location choices. This can occur when two conditions are met. First, as Freeman (1979) observes, for different price functions to exist within an area, purchasers in one segment of the housing market must not participate significantly in other market segments. There must be some barrier to mobility of buyers among market segments. In our view, such a barrier can be geographic (as in distance of a market segment from employment centers) or regulatory (as in land use regulations that set minimum parcel sizes, discrimination, or lack

of information).[4] Second, the structure of demand, supply, or both must be different across the market segments. If market segmentation exists, it may occur along lines defined by neighborhood attributes, structural attributes, or a combination of both (Schnare and Struyk 1976).

The general model for segmentation we use is

$$P_i = a_0 + b_{ij}Z_i + b_{ik}(\text{EXURBAN} * Z_i) + w_j \quad (1)$$

where P is the revealed market price of single-family homes sold during a given period; Z_i is a vector of housing location and household attributes; EXURBAN is a binary variable indicating exurban location (EXURBAN = 1); and w_j is a stochastic disturbance. The segmentation procedure estimates the above equation. Implicit in this procedure are three important assumptions: (1) all households accurately perceive the vector of housing attributes at every location; (2) there is sufficient variation in Z so that the function E(Z) is continuous, with continuous first- and second-order partial derivatives; and (3) the market is in short-run equilibrium.

Segmentation also can be indicated by use of the Chow (F) test (Schnare and Struyk 1976). If it is possible to reject the null hypothesis that the suburban and exurban samples come from similar markets, market segmentation will have been indicated (Bajic 1985; Freeman 1979; Milon, Gressel, and Mulkey 1984; Schnare and Struyk 1976), although the *cause* of segmentation will not have been identified. For this, we must interpret the meaning of individual variables.

Our data come from the AHS because it includes 78 variables characterizing house use, house structure, location and commuting, neighborhood, public services, home financing, and household membership. We rendered that list down to the following variables.

1. Presence of central air conditioning, a binary attribute

2. Annual property taxes (per $1,000 valuation)

3. Number of bathrooms

4. Presence of dishwasher, a binary attribute

5. Number of wage earners

[4] Regulation can segregate housing markets to create, artificially, a clean break (see Davis, Nelson, and Dueker 1994).

6. Number of levels or stories in structure
7. Presence of fireplace, a binary attribute
8. Presence of garage or carport, a binary attribute
9. Years of school completed by head of household
10. House quality rating as defined by the homeowner using AHS categories (1 to 10, with 10 being highest)
11. Overall opinion of neighborhood quality as defined by the homeowner using AHS categories (1 to 10, with 10 being highest)
12. Lot size in square feet
13. Household size
14. Connection to public sewer service, a binary attribute
15. Ethnicity of head of household, with minority being a binary attribute
16. Total number of rooms
17. Commuting time of the primary wage earner
18. House size in square feet
19. Age of house in years
20. Household income

After removing missing observations, we compared means for each variable from the reduced data sets and the complete data sets to verify that the data for each subarea were representative of the complete data sets originally assembled. We found no systematic bias among remaining variables.

A review of the descriptive statistics suggests that many similarities exist between suburban and exurban households with regard to house and neighborhood attributes. The primary differences observed between the two subareas are, naturally, lot size, use of public services (suburbs usually are tied to sewer systems and exurbs usually rely on septic systems), age of structure, and commuting time of primary wage earners (exurbanites commute longer and over greater distances). A particularly notable difference is that,

on average, recent movers to exurbia have lower incomes than their suburban counterparts. Being comfortable that our data are not biased along income characteristics,[5] we test for housing market segmentation between subareas. We find significant interaction variables for air conditioning (0.040), property taxes (0.032), floors (<0.0005), and year built (0.006) (see table 4.) These results suggest that market segmentation may exist relative to house structure, rather than location attributes or along socioeconomic lines.

We also tested market segmentation using dummy permutations. The technique used a piecewise regression model that tests for the presence of changing parameter vectors as a response to dummy interaction terms. The model takes the following form.

$$\text{Value} = \beta_1 + \delta_1 \text{EXURBAN}_t + \beta_2 X_{t2} + \delta_2 X_{t2} \text{EXURBAN}_t + \ldots + \beta_{20} X_{20} + \delta_{20} X_{20} \text{EXURBAN}_t \quad (2)$$

This becomes a joint hypothesis test that H_O:$\delta_1 = \delta_2 \ldots = \delta_{20} = 0$ against the alternative that at least one δ does not equal 0. The Chow (F) statistic in this case is $u = (SSE_r - SSE_u) / J\sigma$, where SSE_r is the sum of squared errors from the model restricted by the null hypothesis and SSE_u is the sum of squared errors in the full (unrestricted) model. J is the number of hypotheses and the estimate of σ^2 is calculated as $SSE_u / (T - 2K)$ for the full model (Judge et al. 1988). We estimated restricted and unrestricted models for the national data. Because the sample size was 2,478, the denominator degrees of freedom were set at ∞. The numerator degrees of freedom were 20 in each case, so $F_{(20,\infty\ \alpha = 0.01)} = 1.88$ was used for hypothesis testing. With an F-test statistic of 3.627, the null hypothesis was rejected, but not for reasons associated with location per se.

Overall, market segmentation between exurban and suburban households is revealed through the examination of EXURBAN interaction variables and the Chow (F) test but the reasons are not related to location or socioeconomic factors; instead, they are related to attributes of the house itself (such as air conditioning). The results are not sufficiently compelling to dismiss the conventional theory of urban form. From parametric analysis, exurbia appears to be little more than a continuation of the processes underlying suburbanization; households choosing the extended suburban lifestyle do not differ fundamentally from those choosing conventional suburban locations.

[5] We tested for this separately, finding no systematic bias with respect to income, per se (see Nelson and Sanchez 1997).

Table 4. **Market Segmentation Regression Results**

Variable	*B*	*SE B*	*Beta*	*T*	*Sig T*
With (*EXURBAN* * Z_i) Interaction					
Air conditioning	8,182.41	3,988.425	0.046	2.052	0.0403
Property taxes	31,314.97	14,557.928	0.050	2.151	0.0316
Bathooms	−6,290.09	3,461.226	−0.085	−1.817	0.0693
Dishwasher	4,646.15	4,356.114	0.030	1.067	0.2863
Wage earners	898.83	2,575.889	0.014	0.349	0.7272
Floors	12,057.72	2,782.005	0.186	4.334	0.0000
Fireplace	−5,977.90	4,079.724	−0.035	−1.465	0.1430
Garage	−3,999.92	4,065.795	−0.027	−0.984	0.3253
Householder education	388.64	720.475	0.042	0.539	0.5896
House quality	−164.81	1,141.400	−0.011	−0.144	0.8852
Neighborhood quality	−1,203.98	1,027.906	−0.084	−1.171	0.2416
Lot size	−0.04	0.038	−0.037	−1.040	0.2986
Household members	719.30	1,352.885	0.020	0.532	0.5950
Public sewer	−2,571.92	4,602.130	−0.011	−0.559	0.5763
Householder minority	14,237.24	8,407.483	0.112	1.693	0.0905
Rooms	−1,477.55	1,383.446	−0.077	−1.068	0.2856
Householder commuting time	−146.22	84.562	−0.043	−1.729	0.0839
House size	−2.19	2.471	−0.038	−0.888	0.3745
Year built	−289.51	104.527	−0.066	−2.770	0.0057
Household income	0.08	0.083	0.033	1.019	0.3082
(Constant)	−62,954.37	9,685.086		−6.500	0.0000

Note: Dependent variable is sales price of home.

Implications

The primary implication of our work is that in basic theoretical terms, metropolitan areas are not reliably delineated into distinct rings of suburban and exurban development. A heavy reliance on the differentiation of urban populations by income class instead of by locational preferences and the willingness of households to trade off space, cost, and convenience may lead to erroneous generalizations about the structure of the urban landscape. Our work suggests that so-called exurbanites are very similar to suburbanites in many ways; their primary differences may be that they simply have a greater desire to locate away from urban-related problems and disamenities. But because exurbanites will not spend any more money on housing (relative to income) than suburbanites, even this remaining proposition is suspect. One thing does stand out: Households with middle incomes and families in the child-rearing stage of the family life cycle are slightly more likely to move into exurbia than are other families. By extension, smaller families or families at the early and late life cycle stages are more likely to choose suburban locations. This finding alone does not warrant consideration of the exurban landscape as anything but the suburbanization of the suburbs. There is no clean break, just continuing suburbanization.

We are concerned that continued outward expansion of suburbia may be due to the inability of urban and suburban governments to provide suitable public facilities and services at prices acceptable to residents. It also may result from suburban policies that constrain the supply of housing relative to demand through NIMBY (not in my backyard) opposition to affordable housing or innovative housing configurations, or simply through exclusionary zoning practices. Very low density development in the extended suburban fringe can require new public investments in roads, water and sewer systems, and other services that are much more costly per unit of demand there than in suburbia. Who pays those costs?[6] Substantial evidence suggests that it is not those who live there (see Burchell et al. 1998). States already subsidize much of the road costs in the extended suburban fringe and also underwrite loans for water and sewer systems. Some states help pay for new schools even when urban and suburban schools are closing for lack of demand. New infrastructure investment in the extended suburban fringe may deprive urban and suburban areas of the resources they need to respond to changing needs.

[6] Orfield (1997) provides an important discussion on the effects of political fragmentation on urban infrastructure provision and associated costs.

Ultimately, we are concerned that extended suburban development weakens efficiencies associated with urban agglomeration. Trade area thresholds for retail and service activities may not be met at the margin. Metropolitan economic activity thus can become less robust as a consequence.

Conclusion

Our analysis focused on some fundamental aspects of suburban household location behavior, revealing that there is no clean break between motivations for settling on either side of some line. A distinct separation between suburban and exurban household types does not appear to exist. Such households appear to be more similar than different. Additional research into residential preferences and attitudes may provide further explanation for the findings presented here. Our findings suggest nonetheless that extended suburbanization may challenge a variety of social, governmental, and economic systems and could in many respects undermine them.

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References

Alonso, William. 1960. A Theory of the Urban Land Market. *Papers and Proceedings of the Regional Science Association* 6:149–57.

Bajic, Vladimir. 1985. Housing Market Segmentation and Demand for Housing Attributes: Some Empirical Findings. *American Real Estate and Urban Economics Journal* 13(1):58–75.

Berry, B. J. L., and Quentin Gillard. 1977. *The Changing Shape of Metropolitan America*. Cambridge, MA: Ballinger.

Bourne, Larry S. 1980. Alternative Perspectives on Urban Decline and Population Deconcentration. *Urban Geography* 1(1):39–52.

Burby, Raymond J., and Linda Dalton. 1994. Plans Can Matter! The Role of Land Use Plans and State Planning Mandates In Limiting the Development of Hazardous Areas. *Public Administration Review* 54(3):229–37.

Burchell, Robert, et al. 1998. *The Costs of Sprawl Revisited: Literature Review*. New Brunswick, NJ: Center for Urban Policy Research.

Burgess, Earnest W. 1925. The Growth of the City. In *The City,* ed. Robert E. Park, Earnest W. Burgess, and R. D. McKenzie. Chicago: University of Chicago Press.

Cervero, Robert. 1986. Unlocking Suburban Gridlock. *Journal of the American Planning Association* 52(4):389–406.

Davis, Judy S., Arthur C. Nelson, and Kenneth J. Dueker. 1994. The New 'Burbs. *Journal of the American Planning Association* 60(1):45–60.

Dueker, Kenneth J., James G. Strathman, Irwin P. Levin, and Alan G. Phipps. 1983. Rural Residential Development within Metropolitan Area. *Computers, Environment and Urban Systems* 8(2):121–29.

Fisher, James S. and Ronald F. Mitchelson. 1981. Forces of Change in the American Settlement Pattern. *Geographical Review* 71(3):298–310.

Freeman, A. M. 1979. *The Benefits of Environmental Improvement*. Baltimore: Johns Hopkins University Press.

Garreau, Joel. 1991. *Edge Cities: Life on the New Frontier*. New York: Times Books.

Gordon, Peter, Ajay Kumar, and Harry W. Richardson. 1989. The Influence of Metropolitan Structure on Commuting Time. *Journal of Urban Economics* 26:138–51.

Grubb, W. Norton. 1982. The Flight to the Suburbs of Population and Employment, 1960–70. *Journal of Urban Economics* 11:348–67.

Jackson, Kenneth. 1985. *Crabgrass Frontier: The Suburbanization of the United States*. New York: Oxford University Press.

Johnson, Kenneth, and Calvin Beale. 1998. The Revival of Rural America. *The Wilson Quarterly* 22(2):16–22.

Johnston-Anumonwo, Ibipo. 1992. The Influence of Household Type on Gender Differences in Work Trip Distances. *Professional Geographer* 44:161–69.

Judge, George G., R. Carter Hill, William E. Griffiths, Helmut Lütkepohl, and Tsoung-Chao Lee. 1988. *Introduction to the Theory and Practice of Econometrics.* New York: John Wiley & Sons.

Lang, Robert E. 1994. Beyond the Office Park: A Typology of Northern New Jersey Business Centers. Unpublished report. Rutgers University, Center for Urban Planning Research.

Lang, Robert E., James W. Hughes, and Karen A. Danielsen. 1997. Targeting the Suburban Urbanites: Marketing Central-City Housing. *Housing Policy Debate* 8(2):437–70.

Long, Larry, and F. DeAre. 1988. US Population Redistribution: A Perspective on the Nonmetropolitan Turnaround. *Population and Development Review* 14:433–50.

Long, Larry, and Alfred Nucci. 1997. The "Clean Break" Revisited: Is U.S. Population Again Deconcentrating? *Environment and Planning A* 29:(8):1355–66.

Mills, Edwin S. 1972. *Studies in the Structure of the Urban Economy*. Baltimore: Johns Hopkins University Press.

Milon, J. Walter, Jonathan Gressel, and David Mulkey. 1984. Hedonic Amenity Valuation and Functional Form Specification. *Land Economics* 60:378–87.

Muller, Peter O. 1976. *The Outer City*. Chicago: Association of American Geographers.

Muth, Richard. 1969. *Cities and Housing*. Chicago: Chicago University Press.

Nelson, Arthur C. (with Kenneth J. Dueker). 1989. Exurban Living Using Improved Water and Wastewater Technology. *Journal of Urban Planning and Development* 115(3):101–13.

Nelson, Arthur C. 1992. Characterizing Exurbia. *Journal of Planning Literature* 6(4):350–68.

Nelson, Arthur C. (with William J. Drummond and David S. Sawicki). 1994. Economic Development Policy Implications of Exurban Industrialization. *Economic Development Review* 9(2):91–100.

Nelson, Arthur C. 1998. The Exurban Battlefield. In *The Contested Landscape,* ed. Owen Furuseth and Mark Lapping. Aldershot, UK: Avebury. forthcoming.

Nelson, Arthur C., and Thomas W. Sanchez. 1997. Exurban and Suburban Households: A Departure from Traditional Location Theory? *Journal of Housing Research* 8(2):249–76.

Nucci, Alfred, and Larry Long. 1995. Spatial and Demographic Dynamics of Metropolitan and Nonmetropolitan Territory in the United States. *International Journal of Population Geography* 1:165–81.

Orfield, Myron. 1997. *Metro Politics: A Regional Agenda for Community and Stability*. Washington, DC: Brookings Institution.

Richardson, Harry W. 1977. On the Possibility of Positive Rent Gradients. *Journal of Urban Economics* 4(1):60–68.

Schnare, Ann B., and Raymond J. Struyk. 1976. Segmentation in Urban Housing Markets. *Journal of Urban Economics*. 3:146–66.

Singell, Larry D., and Jane H. Lillydahl. 1986. An Empirical Analysis of the Commute to Work Patterns of Males and Females in Two-Earner Households. *Urban Studies* 23(2):119–29.

Spectorsky, Auguste C. 1955. *The Exurbanites*. Philadelphia: Lippincott.

U.S. Office of Technology Assessment. 1995. *The Technological Reshaping of Metropolitan America*. Washington, DC: Congress of the United States.

Vining, David R., Jr., Robert L. Pallone, Han Lin Li, and Chung Hsin Yang. 1983. Population Dispersal from Core Regions. In *Transition to the 21st Century: Prospects and Policies for Economic and Urban-Regional Transformation*, ed. Donald A. Hicks and Norman J. Glickman, pp. 81–112. Greenwich, CT: JAI.

White, Michelle J. 1986. Sex Differences in Urban Commuting Patterns. *American Economic Review* 76(2):368–72.

White, Michelle J. 1988. Location Choice and Commuting Behavior in Cities with Decentralized Employment. *Journal of Urban Economics* 24:129–52.

Yamada, H. 1972. On the Theory of Residential Location: Accessibility, Space, Leisure and Environmental Quality. *Papers of the Regional Science Association* 29:125–35.