CREATING A MODEL FOR GEODEMOGRAPHIC REPRESENTATIONS OF HOUSING MARKET ACTIVITY: A RESEARCH NOTE WITH POSSIBLE PUBLIC POLICY IMPLICATIONS

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ABSTRACT: *This paper addresses the future of housing market research utilizing a new model for parcel-based evaluation. The new method addresses the shortcomings of the current standard unit of analysis, which looks at these markets on aggregate levels. By analyzing temporal changes in individual housing units or parcels, concrete conclusions can be drawn on the shifting of wealth in Philadelphia, Pennsylvania and perhaps, abroad, the product of which could prove to be significant to the future of private investment and public policy.*

Although there is a wealth of theory on the causes of gentrification and the housing market trends that accompany it, the amount of empirical data that have been collected on the subject are not bountiful. Perhaps the most prevalent reasoning behind the lack of data stems from an inherent difficulty in modeling neighborhood change through micro-level housing markets as changes occur. Currently, there exists no comprehensive model for housing markets on a neighborhood level, only data that address partial models (Arnott, 1999). There is an understandable difficulty, then in rendering data on gentrification as its theories stem from these same market complexities.

Historically, additional problems arise from research attempting to link both production and consumption side arguments to an explanation of gentrification. Although there has been a plethora of research on this dichotomy, namely Hamnett (1984;1991), Ley (1980;1981), Rose (1984), and Smith (1979; 1987), it appears an accurate and complete explanation has, to date, been unattainable. As Chris Hamnet argues:

> …Both of the two principal theoretical perspectives *(*production v. consumption*)* on gentrification are partial abstractions from the totality of the phenomenon, and have focuses on different aspects to the neglect of the other, equally crucial elements (Hamnet, 1991, p.175)

Although gentrification cannot be explained without the acknowledgement of both production and consumption as important features of the phenomenon, one should also consider the changes that housing markets tend to undergo. These include, but are not limited to, market price, physical condition, as well as the rate that a unit changes hands over time.

A more complete explanation of gentrification would have to address the proverbial chicken and egg conundrum: must there be a supply of gentrifiable housing in order for there to be a demand for it; or is the supply of gentrifiable housing dependent on consumer demand? Regardless, if the causality question is tabled and effect is analyzed, "gentrified" neighborhoods should show some sort of temporal change in economic characteristics. This paper seeks to address such an issue, and provide a more efficient means of studying this premise.

The first section of the article will offer some key perspectives on several noteworthy topics pertaining to spatial representations of housing markets as a whole. The second section offers current research possibilities that are relevant to the economic framework of neighborhood change. Finally, the third section will discuss the value of this research in analyzing a contemporary urban dilemma: lower-class residential displacement that is a result of economically revitalized neighborhoods.

Ultimately, researchers looking at gentrification are seeking to track both housing markets and the residents living within (production and consumption arguments). It should be stated, that this research, as it stands currently, largely neglects the residents within these neighborhoods. This is not done to overlook the previous literature, but to broaden our knowledge of gentrification by

developing research questions about new, wealthier inner-city neighborhoods and their effects on the city as a whole. Thus, the research discussed in this paper focuses on techniques for documenting neighborhoods that have experienced levels of economic growth, rather than dealing with the definitional issues of gentrified neighborhoods.

Previously, researchers have relied upon census demographic data and economic and social proxy indicators to analyze changes in housing markets. This however, comes with a laundry list of inherent difficulties. These include error-free modification of boundary lines over time, (Atkinson, 2000); using census indicators as proxies for real life trends; and relying on random sampling techniques.

As an illustration of this sampling technique and its use in predicting change in housing markets, Figure 1 (for clarification purposes, I will refer to this methodology as Analysis A), represents the percentage change in median household income from 1990 to 2000 in Philadelphia, Pennsylvania. Any area shaded either of the two colors of blue represents a percentage increase in median household income, while the two shades of green and the shade of yellow represent a percentage decrease.

Analysis A was constructed to illustrate fluctuations in housing markets in Philadelphia, but falls short of any conclusive pattern based on the use of only one proxy indicator as well as the use of just two decennial census counts. Analysis A does, however, act as a good model for showing temporal spatial changes in housing markets. This is especially true as it overcomes Atkinson's problem of compensating for changes in census boundaries over time. Here this is accomplished by utilizing raster mapping to convert existing polygons into grid boxes allowing both the 1990 and 2000 maps to be calculated upon freely. Although this technique greatly reduces the amount of error Atkinson would have encountered, the method is not perfect, as some smoothing does occur. Nevertheless patterns found throughout the map and most importantly in the cutout of South Philadelphia could point to some interesting results if the data could be compiled and mapped without these error prone methodologies.

There is one other important limitation of the kind of analysis used in Analysis A, and is the basis for revising the methodology (the revision shall be referred to as Analysis B). Defining a researchable housing market is always a crucial first step in the research process. In a discussion of spatial analysis problems, Goss notes that there exists an "erroneous assumption that patterns or relationships between data observed at an aggregate level of analysis also applies to data at the level of the individual (Goss, 1995 p.181)." Although Goss's conclusion was aimed at companies using spatial analysis for consumer marketing, the same principal holds true for any discussion of geodemographic analysis, and is indeed an observable dilemma in the progression of the research presented in this paper.

Analysis A looked first at census tracts averaging approximately 4,000 residents. It was quickly determined however, that census tracts will not produce precise enough patterns simply because housing markets have the potential to fluctuate on micro levels. Therefore, census data rendered in block groups were used for the analysis. There are 1,816 individual block groups throughout the city of Philadelphia as opposed to 366 census tracts, resulting in data that are potentially five times more accurate. Nevertheless, as Goss would agree, a five-fold increase in accuracy is not sufficient to faithfully represent economic change in housing markets. To be 100% correct, the smallest unit of analysis must be employed, the individual housing unit. As the census does not provide these data, one must resort to another data set that contains information on individual housing units. One such data set does indeed exist for the City of Philadelphia, compiled by the Philadelphia Board of Revision of Taxes (BRT).

The BRT is a governmental organization that amongst other duties is required to make annual assessments of real property throughout the city of Philadelphia for taxation purposes (BRT, 2005). The BRT keeps thorough records on property characteristics including land area, market value, sale date and price, owner name, etc.

There are three variables found in the BRT data that are applicable to Analysis B. The first is change in market sale price (adjusted for real dollars) of a housing unit (m) over a given span of time (t), while the second is the number of times the property has turned over (o) in a given span of time. For the purposes of this paper t will be equal to 10 years. The output of the following function yields a tangible index the results of which can be mapped efficiently:

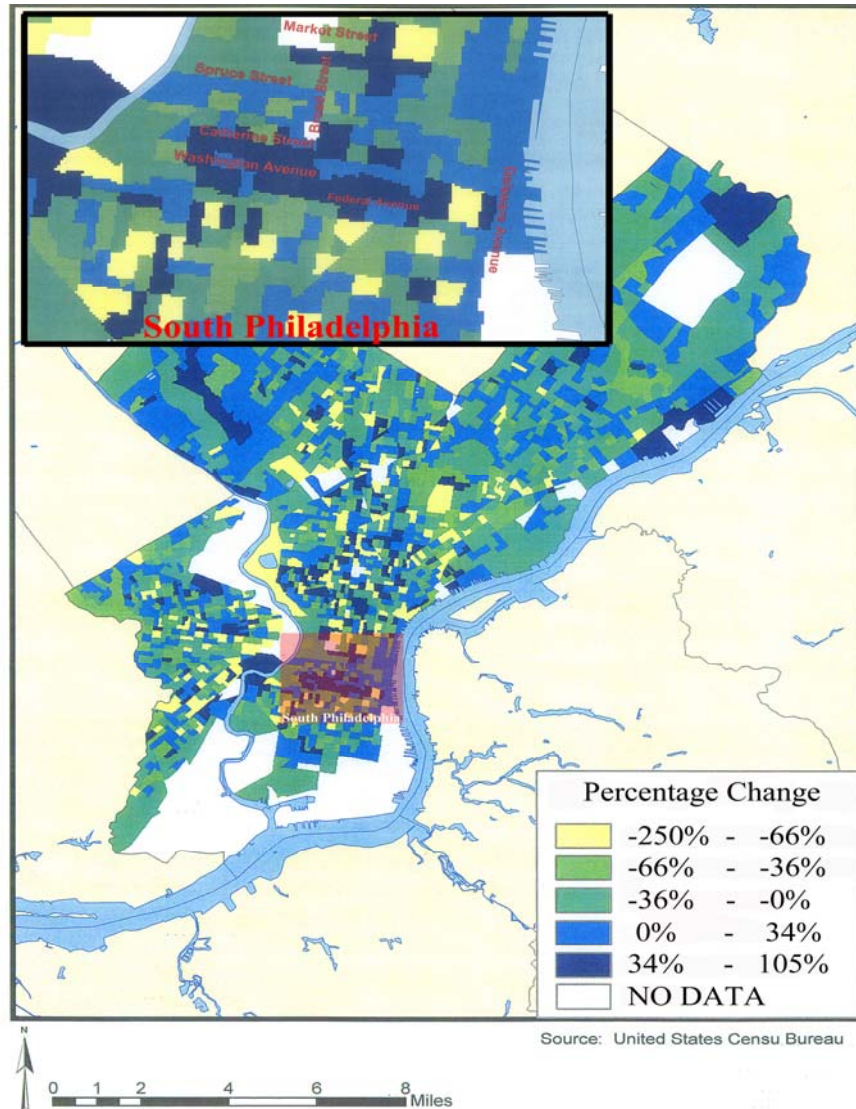$m / (o / t)$ = Housing Market Activity Index (HMAI)

Figure 1. Percentage (%) change in median household income (1990-2000)
by block group

The above index would be accurate only if there was a found correlation between a rise in market sale price and the number of times the property turned over in a given span of time. If a correlation exists, the HMAI index would create a ranking system of sorts, showing temporal change on the basis of <u>individual</u> housing units. If mapped error free, the spatial output would be quite remarkable. The map would show how Philadelphia neighbor-hoods have been transformed in the course of recent

years, revealing centers of high gentrification activity and the boundaries of areas likely to be subject to gentrification in the future. The value of such information would have incredible consequences for private investors as well as public policy makers.

The HMAI would have to be computed for over 500,000 parcels throughout the City of Philadelphia. If $t = 10$, this would yield over five million data points, an intimidating number indeed. Additionally, it should be noted that many of the

properties included in the analysis are rental properties that have not been bought or sold in the ten-year time span. Though this means that a substantial portion of the properties may have to be excluded, the scale of this problem may not be too widespread, as the literature clearly points to a change in housing tenure (from rental to owner occupied) in reinvested neighborhoods (Hamnett, 1991). There is one further difficulty however, that could delay the GIS analysis even if data are secured.

In order to map 500,000 properties, a Philadelphia parcel map would have to be utilized. As it stands, two very capable Philadelphia non-profit organizations have taken on the grueling task of geocoding the parcel map, in an attempt to make it GIS ready. This task requires hundreds of hours of data entry and error correction, or perhaps an extremely robust algorithm aimed at automating the process. Regardless, this research cannot go forward until the parcel map has been properly geocoded. Technically, Analysis B could utilize a small portion of the parcel map that has already been geocoded. This analysis at the neighborhood level for example, still offers the potential for promising results.

Although this research is in its infant stages, its potential provides an encouraging example of the value that GIS technologies offer and their importance in the future. What's more heartening, is the notion that analysis of housing data can be done on exceedingly fine spatial levels. In the present context however, the data would show how reinvested (perhaps gentrified) neighborhoods are effecting the lower income populations that they have displaced. This has extremely important consequences on how policy makers will have to address the future housing needs of the poor.

The combination of the Section 8 subsidy in association with HOPE VI (Housing Opportunities for People Everywhere) grants has succeeded by combining both private renters/owners and government subsidized renters in the same neighborhood. This fusion has created the theoretically sustainable "mixed-income" communities, by taking residents who contributed to a concentration of poverty in their former neighborhoods, and inserting them into new neighborhoods where this high concentration does not exist. The end result is a lessening of the concentration in the former neighborhood and a significant amelioration of the negative blight

symptoms found throughout the city. Indeed, it has allowed impoverished households access to better social services, in the hope that future generations can rise above poverty levels.

This outcome may provide a concrete solution to a problem that has manifested itself in this country since the American suburban diaspora. The question that policy makers and researchers need to answer is whether or not these mixed income neighborhoods have any chance of long-term success. Currently, whether or not housing units receive Section 8 subsidies is a decision left up to private rental landlords. The Department of Housing and Urban Development (HUD) releases annual updates setting the fair rental price of zero (studio apartments) to four bedroom properties in both metropolitan and non-metropolitan municipalities across the U.S. In 2001, the fair market rent for a two-bedroom unit in Philadelphia was $657 (Federal Register, 2001). Therefore, if a landlord assessed his property to be at or under this rate in 2001, (s)he could potentially rent the property to a Section 8 recipient. But what happens when the market in his or her neighborhood exceeds the fair market rent? If the market dictates that (s)he could receive more than $657 for this unit, what incentive does the landlord have to keep renting below market rate? Chances are, (s)he would either discontinue the lease with the Section 8 recipient, and rent to a private tenant who could afford the higher monthly cost, or sell the property to a landlord that will. This process thereby displaces the Section 8 tenant to another market that falls within this fair market rental rate. After a sufficiently widespread rise in an area's rental rate, tenants will undoubtedly be displaced back into low-income neighborhoods. These neighborhoods would then contain a reconcentration of poverty.

The theoretical explanation of how neighborhood reinvestment displaces the urban poor is to date just that; theory. Nevertheless if finite housing market trends were mapped, researchers would have a far better model for displacement. Analysis A (Figure 1) illustrates some of these trends, but is not nearly precise enough to serve as the basis for concrete conclusions. However, if the same trends are examined using Analysis B, superior results may follow.

The displacement issue is one in a series of many issues that research of this type could evaluate. Currently, GIS is being applied mostly in the

environmental sciences as well as a regional and city planning tool. Its potential as a social science research tool however is still greatly untapped. This resource offers researchers a tool beyond standard statistical analysis, and perhaps most importantly offers audiences a tangible illustration of an important point. Statistical data representations are often accompanied by lengthy discourse attempting to frame important findings. GIS enables the researcher to present a point or a finding with very little explanation. The old adage most certainly rings true: a picture is worth a thousand words.

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