Hedonic Estimation and Policy Significance of the Impact of HOPE VI on Neighborhood Property Values

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Abstract

HOPE VI was designed as a program to revitalize distressed public housing. This study uses hedonic methods to test whether projects that are rebuilt with HOPE VI funds have a positive effect on surrounding property values. Comparisons are made between HOPE VI and other types of public housing programs using data on property values by census block groups from the 2000 census. We find that HOPE VI had a statistically significant positive impact on surrounding property values on the order of 8–10% for every quarter-mile closer that a housing unit was located to the development. Other public housing developments were found to have little if any effect on property values.

Introduction

HOPE VI was created in 1992 to rebuild failing housing projects around the country. The scope of the plan was broad. It would lower the density of existing public housing developments and allow for the development of mixed-income communities. The process was designed to renew entire neighborhoods so that surrounding residents (as well as public housing tenants) would benefit from the renovations. HOPE VI would become a revolutionary program which would attempt to change attitudes toward public housing.

Central to measuring the success of public housing programs is measurement of the program’s perception by both residents and surrounding community members. The “not in my backyard” or NIMBY phenomenon displayed by lawmakers and community members has plagued public housing programs since their inception and is still prevalent today. In communities throughout the United States, public housing is widely perceived to cause negative externalities including reduced property values and even neighborhood decline (Massey & Denton, 1993). One approach to evaluating the extent of this phenomenon is to poll community members about impacts of public housing. Almost all of the research which has been commissioned by Housing and Urban Development (HUD) on HOPE VI has relied on firsthand interviews and other anecdotal evidence to evaluate the program’s impact (Buron, Popkin, Levy, Harris, & Khadduri, 2002; Cuomo, 1999; Holin & Amendolia, 2001; Naparstek, 2000; Popkin, 2002; Popkin et al., 2002). This type of research provides a snapshot of how targeted populations feel about their neighborhoods. Because of the overwhelming size of the task, these types of studies cannot poll the entire population that is affected by one HOPE VI development, let alone developments in multiple cities. For example, there are 43,307 people with a 1.5 mile radius of the Richard Allen Homes HOPE VI project in Philadelphia alone. These studies were not designed to give a comprehensive picture of neighborhood effects. An alternative way to understand the effect on the entire population is through the use of census data. The caveat to this approach
is that the Census Bureau does not ask questions specifically related to public housing. Therefore, indirect methods of measurement must be employed.

One such indirect approach is to focus on property values. If public housing causes negative externalities, then this should be reflected in lower property values surrounding the project. Since residents are all participants in the real estate market, it is reasonable to assume that each has made a purchasing decision that has maximized his or her utility based on a set of preferences constrained by his or her budget. With 2000 census data, it is possible to obtain median housing values for large portions of the population. Using hedonic methods, one can obtain estimates of the implicit prices that community members, on the whole, have placed on attributes that comprise a neighborhood. One such attribute is the proximity to public housing. Therefore, property values can be used to obtain estimates of the price of proximity to public housing. In this article, the principal price examined will be proximity to a HOPE VI project.

A Brief History of Public Housing in the United States

Since subsidized housing programs began in the United States in 1937 with the creation of the National Housing Act, they have grown to provide shelter for more than 1.4 million of America’s rural and urban poor. In 1965, subsidized housing programs were expanded substantially with the creation of the Department of Housing and Urban Development (HUD), a cabinet-level agency. HUD now administers all federal subsidized housing programs through the Office of Public and Indian Housing. They work in conjunction with local public housing authorities (PHAs), which exist in most cities across the United States to provide subsidized housing to meet the needs of the nation’s poor.

HUD’s primary role is to make sure that the nation’s housing needs are represented at a federal level. With a few exceptions, subsidized housing is built and managed by local PHAs. Most subsidized housing projects are financed by local and state governments along with HUD, which provides assistance in the form of targeted grants. In general, PHAs own the units in a particular housing project and act as a “landlord,” collecting rent each month from the residents. Rent levels are subsidized, with the level of subsidy depending on each tenant’s income and other economic factors. Often there are large waiting lists for subsidized housing. Subsidized housing problems and solutions vary widely from city to city and can differ within a particular city, but in general, there are four types of subsidized housing run by PHAs: housing projects, scattered-site public housing, housing choice voucher programs, and mixed-income housing.

By the late 1980s, some of the housing projects in the United States, especially in urban areas, had become noticeably distressed and in need of revitalization. The problem of isolation of public housing tenants from the local community was often cited (Naparstek, 2000). There are numerous reasons for this, differences in income, differences in education, high crime rates, lack of employment, social mobility problems, and racial makeup among them, but from an urban planning perspective, one of the biggest problems has been that local politics have historically attempted to segregate public housing. Housing projects were often constructed in underdeveloped and often undesirable parts of the city such as near
highways, on leftover industrial parcels, or often simply at great distances from residential neighborhoods (Naparstek, 2000). As the nation’s housing projects aged, it became progressively costlier for local PHAs to maintain them, yet the income of residents continued to fall, meaning that PHAs needed to pay out larger subsidies. These two factors combined with the reduced federal budgets of the 1980s created fiscal problems for local PHAs. As a result some of the housing projects fell into disrepair. In some cases demolition and reconstruction would have been the best solution for these problems, but PHAs were prevented from doing this by federal regulations. Rules such as the one-for-one replacement rule, which required local PHAs to replace one-for-one each unit of public housing razed, made it almost impossible for dilapidated buildings to be destroyed (Naparstek, 2000).

To address the mounting problems of PHAs around the country, Congress created the National Commission on Severely Distressed Public Housing in 1989. The commission spent 18 months visiting public housing developments in 25 cities around the country, interviewing residents and public housing workers. The four main problems reported were: high crime, high unemployment, deteriorating units, and disincentives for self-sufficiency. When the commission submitted its final report to Congress in 1992, they found that approximately 6%, or 86,000 public housing units, were classified as “severely distressed.” It is important to note that this number may be an underestimate since there was a lack of data for many PHAs. Also, PHAs differed in how they tracked their projects; the criteria for what constituted a distressed project for one PHA was often different than the criteria used by another PHA. In addition these problems were apparent in almost all public housing, not just those classified as distressed.

The commission’s identification of a defined set of severely distressed units—estimated at 86,000, or roughly 6 percent of the total inventory—betrays the true nature of the problem, which is symptomatic of the entire public housing program and not confined to selected development. (Epp, 1996, p. 569)

Some of the recommendations the commission made for reform were to:

- create housing that encourages income-mixing across families
- pursue private and nonprofit management
- increase funding for supportive services
- develop better channels of communication for resident input

The Creation of HOPE VI

Congress responded to the recommendations of the commission with the creation of the Urban Revitalization Demonstration program (URD) which is better known as HOPE VI (Housing Opportunities for People Everywhere) in 1992. HOPE VI was designed to restore the nation’s most distressed public housing. In 1993, 40 of the nation’s housing authorities became eligible for HOPE VI grants; all but one applied (Epp, 1996). In the first two years (1993 and 1994), Congress authorized $1.2 billion to 32 PHAs across the country. See Salama (1999) for further discussion of HOPE VI goals and history.
Today, there have been 165 HOPE VI revitalization grants awarded and a total of $4.5 billion appropriated. HUD estimates that there will be about 71,900 units of distressed public housing demolished, of which 50,000 were currently occupied, and 42,000 units replaced. Many of these projects are comprehensive community building programs, not just demolition and rebuilding of housing; many include job training programs with local merchants, partnerships with schools, counseling services, and programs for children (Naparstek, 2000).

Residents of housing projects that undergo HOPE VI revitalization are given four basic options: (1) pass a screening test for a limited number of units in the new revitalized project, (2) use a housing choice voucher, known as a Section 8, in the private housing market,1 (3) move into a different housing project if one is available, or (4) leave public housing (Popkin, 2002). Because of the lowered density and the addition of market-rate units, HOPE VI inevitably causes displacement of public housing residents. This has become the chief criticism of the program.

**Tracking Surveys**

In general, the reaction by local politicians living near HOPE VI projects has been very positive (Cuomo, 1999). Studies focusing on residents in revitalized projects have shown less enthusiastic but generally positive results. The Urban Institute recently completed two comprehensive studies analyzing the impacts of HOPE VI on residents: The HOPE VI Panel Study: Baseline Report and The HOPE VI Resident Tracking Study. These studies reported findings based on interviews with over 1,600 residents in 13 projects that have been revitalized by HOPE VI.

In The Resident Tracking Study, former and current residents were interviewed retrospectively years after their project received a HOPE VI grant for revitalization. The study made several important findings. Overall, the majority of residents reported living in housing that was in better condition than before. Many of the residents who were moved to offsite public housing or given vouchers had located in census tracts with significantly lower crime levels than that of the original housing project. On the whole neighborhood conditions improved for residents of the old project who returned to the revitalized project in seven of the eight sites where interviews took place. As anticipated, many of the residents had encountered serious problems finding new housing (Buron et al., 2002).

The main problem cited with HOPE VI projects has been displacement of public housing residents. In most cases, tenants who are displaced are given Section 8 vouchers or moved into other offsite public housing (Popkin, 2002). This can cause a problem in communities with tight housing markets. Some criticize HOPE VI as being a program of gentrification under the guise of helping the poor (Salama, 1999). The Resident Tracking Survey shows evidence of displacement. Of 818 households interviewed in the sample, only 19% now live in a revitalized HOPE VI development; 29% live in other public housing properties, 33% are renting other housing using housing choice (Section 8) vouchers, and 18% have left public housing altogether. Yet these studies paint a limited picture of HOPE VI since many of the projects studied were not completed. Only two of the eight sites used in the study were fully occupied, four were partially occupied, and two had not yet begun reoccupation (Buron et al., 2002).
A Review of the Literature

Since the majority of HOPE VI grants to date were allocated in the mid-to-late 1990s, many of the projects have only recently begun construction and others are still in the planning stages. Because of the lack of completed HOPE VI projects nationwide, there has been a paucity of research conducted on the effects of HOPE VI on surrounding neighborhoods. The research that has been done on the effects of HOPE VI has largely been confined to reports prepared by or contracted for by HUD, which analyze the social impacts on a few selected sites (Buron et al., 2002; Cuomo, 1999; Holin & Amendolia, 2001; Naparstek, 2000; Popkin, 2002; Popkin et al., 2002).

Importance of Property Values

Property values are believed by many economists to be one of the chief proxies for neighborhood strength. Historically, it has been found that low-income housing is far more likely to be built in areas that have lower median property values. Zielenbach (2003) points out that:

Family public housing, other HUD family housing, and publicly-subsidized units built with equity from the Low Income Housing Tax Credit were far more likely to be developed in census tracts with high proportions of Black and Hispanic residents, high poverty rates, low median incomes, low housing values, and low percentages of single family, owner-occupied units (p. 10).

With the exception of Zielenbach (2003), little has been offered in the way of hard numbers evaluating the economic impact of HOPE VI. Zielenbach’s is the only study so far to attempt to study the impact of HOPE VI on property values. His study takes an unconditional look at changes in property values within HOPE VI neighborhoods. However, other subsidized housing programs prior to HOPE VI have been the subject of exhaustive research using statistical methods that isolate their effects on neighborhood property values. In the past, this research has concentrated on centralized public housing programs (De Borger, 1986; Martinez, 1988; Matulef, 1988). More recently, this research has focused on scattered-site programs such as HUD’s Section 8 and Section 202 programs (housing choice vouchers for seniors) and the comparison of the impacts of these programs on property values to more traditional types of public housing programs (Galster, Santiago, Smith, & Tatian, 1999; Lee, Culhane, & Wachter, 1999; Lyons & Loveridge, 1993).

Using a combination of Census Bureau data, Federal Financial Examination Council data, and local community police department data, Zielenbach (2003) focused on economic indicators and included changes in property values for eight HOPE VI “neighborhoods” throughout the country. The findings were that average housing prices in HOPE VI communities in Denver, Colorado, El Paso, Texas, and Seattle, Washington, increased by 5.5% relative to those cities’ real estate markets from 1993–1994 to 2000–2001. As noted in the study, the report fails to control for other non-HOPE VI related factors, which limits the usefulness of the findings.
Using hedonic price models, Galster et al. (1999) estimate the effects of dispersed housing programs, with an emphasis on Section 8 vouchers. As they describe, extensive research in the 1980s found that subsidized housing had little effect on housing prices and that, in some cases, it even caused a slight increase in housing prices (Martinez, 1988; Matulef, 1988; Puryear, 1989).

As studies became more sophisticated during the 1990s, the externalities of locating next to different types of housing projects became more quantifiable and better understood due to advances in modeling and available data. Galster et al. (1999) cited the study of Lyons and Loverage (1993), who looked at the tax records that contained property value assessments of 120 locations where federally subsidized tenants lived in St. Paul, Minnesota. The findings were that each subsidized tenant who located within one-quarter mile of a single family home reduced that home’s assessed property value by a statistically significant $21. The study further found that adding an additional proximate site where one or more subsidized tenants lived reduced assessed property values in the surrounding areas by $1,585 per unit if the property was located within one-quarter mile of the subsidized tenant’s dwelling. Going further, Lyons and Loverage separated the different types of public housing program: Section 8, Section 202, Section 221 (a now defunct program of home mortgage insurance for the poor), and concentrated public housing projects. This study finds mixed effects, some programs having strong positive effects on assessed housing values and some having strong negative effects. There is a counterintuitive finding that concentrated housing projects actually raised surrounding assessed property values on average by $19 for each unit added within one-half mile of a dwelling. Each additional Section 8 voucher unit located within one-quarter mile reduced assessed housing values by $50 per dwelling. The authors found no statistically significant relationship between distances (measured from 300 feet to 2 miles) from Section 8 units and assessed property values.

Galster et al. (1999) then went on to cite the work of Lee, Culhane, and Wachter (1999) who find almost opposite effects in their study of single-family houses surrounded by public housing in the Philadelphia area during the 1989–1991 period. In particular, they find that houses located within one-eighth of a mile of any type of conventional public housing unit are 0.8% lower in assessed value and that each additional Section 8 unit lowers assessed values by 0.5%. Galster et al. argue that the reason for the disparate results in previous studies has been differences in methodology and they discuss limitations.

**Hedonic Method for Evaluating HOPE VI**

In this article, data from the following cities with HOPE VI projects were used: Atlanta, Georgia (Centennial Place), Charlotte, North Carolina (Earle Village), Kansas City, Missouri (Guinotte Manor), Boston, Massachusetts (Orchard Gardens), Denver, Colorado (Quigg Newton), and Philadelphia, Pennsylvania (Richard Allen Homes). Using similar criteria to Zielenbach’s, these developments were chosen for their size (greater than 200 units), their level of completion (greater than 50%) at the time of the census, and the availability of public information regarding their construction. Since the data used are aggregated to the block group
level, it was important to choose developments that comprised a significant portion of the block group in order to test for an effect. Some of these developments, such as Earle Village, were large enough that they comprised almost two full block groups.

The first task was to locate areas surrounding HOPE VI projects. Based on longitude and latitude coordinates provided by the Census Bureau for the center of each block group, sets of block groups for each city were compiled. Block groups included in the set were those that had longitude and latitude coordinates within a radius of 1.5 miles from the center point of the HOPE VI block group in each city.

**Data**

The data are from the 2000 Census Sample Data file, also known as the “Long Form” data, received by one of every six households nationally. To protect confidentiality, sample data are released to the block group level. The dependent variable for the hedonic model is the log of the median specified owner-occupied housing unit value. The question verbatim from the actual 2000 Long Form Census Questionnaire is, “What is the value of this property; that is, how much do you think this house and lot, apartment, or mobile home and lot would sell for if it were for sale?” The respondent then has a choice of 24 boxes with the lowest being “less than $10,000” to “$1,000,000 or more”. For example, one of the values around the middle specifies a range of “$100,000 to $124,999”.

These data may seem problematic since owners of a house might have inherent bias in reporting the value of their home. Kiel and Zabel (1999) have addressed this problem by examining owner-reported housing values in the American Housing Survey (AHS) over an 11-year period in Chicago, Denver, and Philadelphia. The AHS is a housing survey conducted by the Census Bureau every four years at different intervals in cities throughout the United States. The survey has many more detailed housing questions than the decennial census. Kiel and Zabel find that owners tend to overstate the value of their homes by an average of 5% across the areas surveyed. However, they also find that these overestimates have no relation to structural, neighborhood, or environmental characteristics. Therefore, owner’s valuations of their housing “will provide reliable estimates of the prices of house and neighborhood characteristics.” Since AHS questions about property values are similar to those asked on the census, it is reasonable to assume that these findings apply to owner-reported housing value on the census. The other most readily apparent problem with the 2000 census data as they relate to hedonic housing prices is the aggregation of individual household data into block groups. The block groups examined in this study had average populations of 773 residents and 352 housing units. A preponderance of recent research on the effects of housing subsidies on surrounding housing values has used tax records or other forms of individual household level data for models (Chandler, Benson, & Klein, 1993; Galster et al., 1999; Lee et al., 1999; Lyons & Loveridge, 1993). Taylor (in press) wrote, “If available, information on individual units is preferable, especially when a study is focusing on externalities that are likely to be localized.” As men-
tioned previously, in the case of census data, sample question data is only available at the block group level; information on individual units is impossible to obtain using census data.

At this time, this author is unaware of any research which examines census data aggregation as it regards public housing studies. In a related field however, Shultz and King (2001) argued for the benefits of census data aggregation for use in hedonic models for estimating the values of open-space amenities and nonresidential land use in urban areas. They found that aggregating land-use data by block group is preferable to block or tract level aggregation. In addition, they found that the dependent variable, self-reported housing unit values from census data, shows greater variation between block group levels than housing unit values from corresponding property-tax assessment databases compiled for individual housing units. Less variation in characteristics would lead to higher standard errors and less property value variation would lead to lower standard errors. If the findings of Shultz and King are correct, the use of aggregate data will have an ambiguous effect on standard errors.

The aggregate level data will also affect the conclusions that can be drawn from the regressions. Past studies have found average hedonic prices that individual homeowners or apartment owners are willing to pay based on their dwelling’s proximity to public housing. This study finds what entire block groups as a whole are willing to pay, on average, for a certain proximity to public housing.

Data on the location of the HOPE VI projects were collected by telephone interviews conducted by the author with each city’s PHA. Additional data on the location of other public housing projects were obtained from websites.

HOPE VI projects across the country were examined to gain insights on the program’s overall effect on property values rather than its effect on property values for a specific housing authority. In addition, the limitations of the data made it necessary to include multiple cities in order to obtain reasonable sample sizes.

The Regression Model

A nonlinear functional form must be used since housing characteristics cannot be repackaged and traded without large transactions costs. If this were possible, it would imply a linear function, where the total price of the product would be a summation of the individual prices of each good. The most widely applicable form seems to be a semi-log specification, because of its ease of interpretation and relative goodness-of-fit. Galster et al. (1999) cite the Box-Cox transformation as providing a marginally better goodness-of-fit, but the transformation is less useful in the presence of many dummy variables. In addition, the results are difficult to interpret.

The distance to HOPE VI and distance to other public housing variables and their transformed values are crucial to this study. Initially, mapping software was used to compute a list of block groups within 1.5 miles from the block group containing the HOPE VI development in each of the six cities. This provided the total sample. For each of the block groups, the distance variables were computed in the following way: The Census Bureau provides an internal longitude and latitude
point, accurate to within six decimal places, for each block group. This point lies at the center of the tract. This point is somewhat arbitrarily chosen by census mappers since tracts are often irregularly shaped. A distance between longitude and latitude coordinates for two block groups was computed using the following formula:

\[ \text{Distance} = \text{radius of earth} \times \text{acos} (\sin(\text{Latitude}_1/57.3) \times \sin(\text{Latitude}_2/57.3) + \cos(\text{Latitude}_1/57.3) \times \cos(\text{Latitude}_2/57.3) \times \cos(\text{Longitude}_2/57.3 - \text{Longitude}_1/57.3)). \]

For block groups that contain HOPE VI projects, the distances were computed using the radius of the block group rather than using a zero value, which would have unwanted effects on the regression. A radius was computed by using the following formula: \(\sqrt{\text{area of tract}/\pi},\) where \(\text{area of tract}\) is the total area of the tract in ft\(^2\). This provides the radius of a tract assuming a circular shape, which we know not to be true, so there is an inherent error, but it is likely random.

Other variables were computed from data that are publicly available via the Census Bureau’s American Factfinder service on their website. The exceptions to this were the locations of other public housing, which were obtained through personal interviews conducted by the author.

**Specifications**

The neighborhood control variables are designed to control for microneighborhood specific influences which vary across block groups. These are mostly social characteristics that determine the make-up of the block group. The neighborhood control variables are: distance to HOPE VI, distance to other public housing, mean travel time to work, median household income, unemployment rate, percent with bachelor’s degrees, percent single female parent headed households, and vacancy rate. The structural characteristics included are: percent with electric heat, average household size, median year built, median number of rooms, median year owner moved in, and percent of multiple unit structures. These variables are designed to control for differences between housing unit structures in each block group. The number of structural variables provided by the census is more limited than desired. This is especially noticeable when these data are compared with data used in other hedonic analysis. No information is provided on the lot size or the building size, two highly statistically significant variables in previous research (Galster et al., 1999; Lee et al., 1999; Lyons & Loveridge, 1993). Therefore, there is a potential for omitted variable bias. All tables report heteroskedastic consistent standard errors.

The second model is identical to the first except that it adds location fixed effects. These variables are designed to control for differences between markets across the six cities used in the study. The assumption here is that each city has the same market throughout the block groups included in the sample. A series of dummy variables are used for to control for each city’s housing market, with Atlanta being the omitted group. The housing market dummies are used to control for unobserved differences between the markets. These differences may include proximity to desirable (or undesirable) amenities such as a local park not captured by census data. Also accounted for by the city dummies are overriding real estate price trends.

The third model adds two additional dummy variables that flag block groups containing HOPE VI developments and those with other types of public housing.
This specification separates the effects of HOPE VI into the block groups that contain the housing development and those that do not contain the housing development while controlling for all of the other neighborhood, structural, and locational characteristics specified in the first and second models.

**Potential Problems with the Hedonic Model**

The problem of spatial heterogeneity, or market segmentation, is a concern when considering the effect of HOPE VI on an entire MSA. Freeman (2003) defines differing market areas as those with substantial geographical differences, such as a large river dividing a town, as normal causes of market segmentation. Such barriers can lead to substantial differences in the relative strength of real estate markets. Segmented markets require separate hedonic price functions for each market. Freeman (2003) cited Straszheim (1974), who showed that estimating separate hedonic price functions for different market areas in the San Francisco Bay area reduces the sum of the squared errors across the sample as a whole.

Since the data for this study are confined to block groups that were within 1.5 miles of the HOPE VI development, we assume that, a similar market exists within this area. Although a few of the block groups are bordered by rivers, none were separated by substantial geological or man-made features. Clearly, however there is an expected difference between markets across cities. Therefore, dummy variables representing each market are included.

A specific problem with the hedonic model is that it assumes the market is in equilibrium. As discussed by Lyons and Laverage, high vacancy rates reduce the accuracy of the hedonic. In this study, the vacancy rate for all for-sale units had a mean of 3.9% across all block groups. This is low enough so that, on average, we assumed that the markets examined in this study are in equilibrium.

Housing projects are often built in poor neighborhoods on purpose since these neighborhoods are the most in need of subsidized housing (Zielenbach, 2003). Specifically in the case of HOPE VI, since it is a rebuilding program for distressed public housing, these neighborhoods had severe social and economic problems prior to the redevelopment of their projects. Thus, there is a certain amount of endogeneity in the prices, which are found through a hedonic model based on surrounding property values. The hedonic prices estimated for the proximity to public housing are only relevant to residents within a 1.5 mile radius and not generalizable across, for example, an entire urban area.

**Results**

**Control Variables**

Table 1 shows means and definitions for the control variables. The median home value was $143,000. The average distance to HOPE VI project is 0.7 mile.

Table 2 shows the hedonic regressions. The first column shows results without city dummies, while the second and third include city dummies. The neighborhood control variables percent of population under 21, median household income, unemployment rate, percent of single female parent headed households, and vacancy rate produced statistically significant results at the 5% level in all three models. The
coefficients for percent of population under 21 were positive in all three models. Median household income showed positive coefficients as well, suggesting that a $10,000 increase in the median income level would lead to a 10.5% increase in property values in the third model. The unemployment rate and proportion of single female parent headed households have negative impacts on property values. Vacancy rate had negative coefficients in each of the three models. The variable percent below the poverty line only produced significant results at the 5% level in the first model. Mean travel time to work and percent with bachelor’s degree did not produce statistically significant results in any of the models.

Percent of multiple unit structures in the block group raised property values in models 1 and 2. One would expect that higher percentages of multiple unit structures would have a negative effect on property values since single unit homes are generally more expensive than units in apartment buildings. However, the dependent variable is specified owner-occupied housing unit median value, and this excludes housing units in multiple unit structures. Since the value of housing units in multiple unit structures are included in our specification, the coefficient on multiple unit structures is an indirect measurement and therefore only represents the externality that multiple unit structures have on surrounding property values. This externality appears to be positive. The structural control variables, average household size, median number of rooms, and median year owner moved in did not have statistically significant effects. Percent with electric heat shows a significant positive

### Table 1. Descriptive Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median value of specified owner-occupied housing units</td>
<td>145,429</td>
<td>155,413</td>
</tr>
<tr>
<td>Ln median value of specified owner-occupied housing units</td>
<td>11.50</td>
<td>0.989</td>
</tr>
<tr>
<td>Percentage of owner-occupied housing units</td>
<td>0.382</td>
<td>0.228</td>
</tr>
<tr>
<td>Percentage of total population under 21</td>
<td>0.303</td>
<td>0.144</td>
</tr>
<tr>
<td>Percentage of total population below the poverty line</td>
<td>0.294</td>
<td>0.168</td>
</tr>
<tr>
<td>Mean travel time to work for total population</td>
<td>30.5</td>
<td>11.3</td>
</tr>
<tr>
<td>Median household income for total population</td>
<td>28,300</td>
<td>12,272</td>
</tr>
<tr>
<td>Unemployment Rate for total workforce</td>
<td>0.135</td>
<td>0.118</td>
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<tr>
<td>Percentage of total population with a Bachelor’s degree</td>
<td>0.127</td>
<td>0.113</td>
</tr>
<tr>
<td>Percentage of single female parent headed household</td>
<td>0.0563</td>
<td>0.0454</td>
</tr>
<tr>
<td>Dummy for block groups w/ HOPE VI developments</td>
<td>0.0318</td>
<td>0.176</td>
</tr>
<tr>
<td>Dummy for block groups with other public housing developments</td>
<td>0.815</td>
<td>3.65</td>
</tr>
<tr>
<td>Vacancy rate for sale housing units</td>
<td>0.0955</td>
<td>0.295</td>
</tr>
<tr>
<td>Percentage of housing units with electric heat</td>
<td>0.204</td>
<td>0.195</td>
</tr>
<tr>
<td>Average owner-occupied household size</td>
<td>2.67</td>
<td>1.016</td>
</tr>
<tr>
<td>Owner-occupied housing units: median year built</td>
<td>1946</td>
<td>15.5</td>
</tr>
<tr>
<td>Owner-occupied housing units: median number of rooms</td>
<td>6.04</td>
<td>1.406</td>
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<tr>
<td>Owner-occupied housing units: median year that owner moved in</td>
<td>1986</td>
<td>9.91</td>
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<tr>
<td>Owner-occupied housing units: percentage of multiple unit structures</td>
<td>0.299</td>
<td>0.320</td>
</tr>
<tr>
<td>Dummy for city of Atlanta, GA</td>
<td>0.0828</td>
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<tr>
<td>Dummy for city of Charlotte, NC</td>
<td>0.0318</td>
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</tr>
<tr>
<td>Dummy for city of Kansas City, MO</td>
<td>0.0382</td>
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</tr>
<tr>
<td>Dummy for city of Boston, MA</td>
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</tr>
<tr>
<td>Dummy for city of Denver, CO</td>
<td>0.0892</td>
<td></td>
</tr>
<tr>
<td>Dummy for city of Philadelphia, PA</td>
<td>0.452</td>
<td></td>
</tr>
</tbody>
</table>

*Notes. Sample of 157 Census block groups from 2000 Census Sample Data File.*
The variable \textit{median year built} was significant in the first model but had a tiny negative coefficient.\footnote{Note. Numbers in parenthesis are robust (hetoskedastic consistent) standard errors. The dependent variable is the natural logarithm of the median value of specified owner-occupied housing units. \*\textit{p} < 0.10, \*\*\textit{p} < 0.05, \*\*\*\textit{p} < 0.01.}

A chi square test for restriction of zero location effects is rejected at the 1\% level. Thus, different cities have different unobserved components price. We restricted our attention to those models below.

**Public Housing Variables**

The variable indicating \textit{distance from HOPE VI} produced statistically significant results at the 5\% level with negative coefficients. The magnitude estimated by the first three models ranged from $-33$ to $-41\%$ for each mile farther a housing unit
is from the development. The interpretation of these coefficients is that locating near a HOPE VI development increases property values. Since the sample area was only 3 miles in diameter, a more useful interpretation of this coefficient would be to divide it into quarter mile segments. Thus, each quarter-mile increase in distance from HOPE VI would lead to an 8.25–10.25 decrease in property values. The third model separates the effects of block groups that contain a HOPE VI development and those that do not. Unfortunately, the dummy that marks HOPE VI block groups did not produce a statistically significant coefficient, but the distance coefficient remains about the same size and significance, so it is robust.

Distance to other public housing was only significant in the first model, with a coefficient of −0.02. Again dividing that coefficient into quarter-mile segments, this implies a 0.5% increase in property values for each quarter-mile closer that a property is located to other public housing. In the rest of the models, distance to other public housing was statistically insignificant. The dummy variable that marked other public housing projects was statistically insignificant as well.

The fact that the other public housing variables were either statistically insignificant or small when they were significant is an important finding. This suggests that other types of public housing have no effect or at most a tiny positive effect on property values. This corroborates the findings of Martinez (1988), Matulef (1988), and Puryear (1989) (cited in Galster et al., 1999). These findings imply that there is neither a negative nor a positive externality associated with public housing.

The comparison between the effects of HOPE VI and the effects of other public housing developments on property values is dramatic. HOPE VI is found to increase property values in all the models by 8.25% to 10.25% every quarter-mile closer that a housing unit is located to the development while other public housing developments increase property values by −0.5% over the same distance.

Conclusions and Implications
This study finds that the common perception that public housing causes a negative externality is incorrect. In fact, public housing developments may even slightly increase property values. But a more conservative conclusion is that housing values are not affected by their proximity to traditional public housing. The NIMBY phenomenon that is displayed by community members in regard to public housing is therefore unjustified.

HOPE VI, on the other hand, displays a large positive externality. For the same $200,000 home, locating one-quarter mile closer to HOPE VI increases that home's value by $16,500–20,500, holding all else constant.

The policy implications of both these findings are important. Public housing developments should not be feared since they generally have no effect on the surrounding property values. HOPE VI redevelopment should be encouraged by community members because it substantially increases surrounding property values. Taking property values as a proxy for neighborhood strength, it can be concluded that HOPE VI substantially improves the neighborhoods in which it is located.

More research is needed on the effects of HOPE VI developments on property values. Ideally one would want data on individual property prices to use in the
hedonic regression. Alternatively, the release of the Long Form Neighborhood Change Database (NCDB) will allow statistical studies to be undertaken using the pre-/post-approach implemented by Galster et al. (1999). The Long Form NCDB will include census data from the 1990 and 2000 censuses with boundaries adjusted for consistency. Longitudinal studies using these data will be able to control for more neighborhood and structural factors, thereby reducing some of the data limitations of the 2000 data encountered in this study.

Notes

1. Under the Section 8 program, residents pay up to 40% of their income for housing and the voucher will cover the rest.
2. This study uses a method of extrapolating property values from Home Mortgage Disclosure Act Information. This author knows of no other research to date that has used this method.
3. A block group is the smallest unit for which the Census Bureau releases sample-level data. The average block group in this study had 773 residents and 352 housing units.
4. The original approach for this study was a pre-/post-approach as described by Galster et al. with 1990 and 2000 data normalized to 2000 tract boundaries through a data set called the Neighborhood Change Data Base. However, the release of the long-form version of this product turned out to be much later than anticipated, so a cross-sectional, or as Galster et al. call it, an econometric approach using 2000 sample data freely available from “http://www.census.gov” was adopted.
5. The Census Bureau defines a housing unit as “a house, an apartment, a mobile home or trailer, a group of rooms, or a single room occupied as separate living quarters, or if vacant, intended for occupancy as separate living quarters.”
6. The AHS data would actually be a much better data source for analysis of the impacts of HOPE VI on surrounding property values, however for confidentiality reasons, the data do not include location variables, specifically which census tract the houses are located in. Kiel and Zabel’s study was unique in that the authors were able to compel the release of confidential census tract location information for use in their study only.
7. From a post on http://www.experts-exchange.com/Databases/GIS_GPS/Q_20383758.html. The formula was tested on known distances before it was employed. The formula is a generalization for the transformation of distances between spherical coordinates to linear distances. Longitude and latitude squares become smaller the closer they are to the poles, thus, there is inherent error in this formula. However, this error is only a worry at great distances; therefore, it should not be a factor in the calculated distance variables used in this study.
8. From the Census Bureau’s American Factfinder service: “Specified owner-occupied and specified vacant-for-sale housing units include only 1-family houses on less than 10 acres without a business or medical office on the property.” The data for “specified units” exclude mobile homes, houses with a business or medical office, houses on 10 or more acres, and housing units in multi-unit buildings.” The decision to use specified owner-occupied housing units over all owner-occupied housing units was made to avoid including housing unit values which may skew the results—such as properties with businesses attached which would be worth significantly more than surrounding home values. This issue should not be a factor for most of the block groups, since the dependent variable is median rather than aggregate housing unit value. It could present a possible problem for block groups in commercial areas because the number of units excluded due to the specified criteria would be high.
9. Originally the cities of Seattle and Houston were included in the sample, however, it was found that these cities did not contain other public housing developments (besides HOPE VI), at least known to the author, within the 1.5 mile radius. Since comparison of HOPE VI to other types of public housing is one of the primary goals of this study, date from these cities were dropped. Of note is that Seattle did have another HOPE VI development within the 1.5 mile radius. This was especially troublesome since there may have been additional spillover effects from the other HOPE VI development that could not be controlled for.
10. Measurement error may contribute to the lack of significance of the structural variables. The Census Bureau does not provide data for median year built, median number of rooms, median year owner moved in, and percentage of multiple unit structures within the universe of specified owner-occupied housing units,
only within all owner-occupied housing units. As a result, the universe of all owner-occupied housing units was used for these structural variables rather than specified owner-occupied housing units, which would have the ideal case. Since the dependent variable is median value of specified owner-occupied housing units, there may be some block groups, i.e., those with significant differences between the total number of owner-occupied units and the number of specified owner-occupied housing units, for which the median values of these structural characteristics vary significantly.

**About the Authors**

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**References**


