Exodus from the Urban Jungle: An Analysis of Philadelphia's Abandoned Structure Problem

Cesar Casal
The College of New Jersey
April 19, 2002

I. The Nature of the Housing Problem

The Industrial Revolution brought about the rise of cities in America. The labor demands of a rapidly growing manufacturing sector caused a great migration from the rolling farms and plains of the United States to the bustling environs of the metropolis. Cities such as Detroit and Philadelphia grew as fast as the technology could muster; tenements and apartment complexes were built with a marked emphasis on quantity over quality. Today, many of these structures remain. Abandoned, condemned, and decaying, they are a legacy to the bygone era of the birth of America's great industrial centers.

Large tracts of vacant housing are an indication of the lower demand for living space. Indeed, cities with the most well documented problems of abandoned structures, Baltimore, Philadelphia, and Detroit, have had the largest negative population changes in the past few decades (Cohen 2001). Since 1950, Detroit has experienced a staggering 48.6 percent loss in population (no doubt related to the decline of auto manufacturing in the U.S.), while the cities of Baltimore and Philadelphia have experienced population losses of 31.4 and 26.7 percent respectively. Not coincidentally, both of these cities were primary manufacturing centers in the early to mid 20th century, and most of each city's population were employed as such.

It is a logical conclusion that such large changes in population will have equally large changes in the availability of housing stock in a particular city. In the typical development pattern of a city, the supply of housing increases in response to the increase in that city's population. Overcrowding and housing shortages were common problems during the growth era of cities. Developers and planners struggled to provide housing for the ever-increasing flow of migrants. There is an underlying assumption by the builders

that changes in population trends will be minimal, and if not, that they will have enough time to alter their behavior in response to these changes. The possibility of a large population decrease over 40-50 years, like the decrease that occurred in Philadelphia and Baltimore, was not a particularly realistic consideration. As a result of these precipitous declines, housing supply exceeded demand, bringing with it a host of new challenges.

What options exist for property owners in a city with a declining population? Although the housing market exists with some similarity to a commodity market, in that space in the absolute sense is undifferentiated, it has distinct characteristics that become the crux of a city's housing problem. Homes and buildings simply cannot stop producing living space as a response to changes in demand. The land area on which a structure stands cannot be reallocated to more economically advantageous purposes because of the costs inherent in such a process. Owners face the choice of paying the upkeep on property in the hope that population trends and thus demand will change, letting the building fall into disrepair (but keeping its property taxes current). As the condition of the building worsens they are effectively removed from the housing market. The latter option assumes that if the building remains abandoned for a long enough period of time, the city government will have no choice but to reclaim the property from the owner at a price above market value (Scafidi et al. 1998). Ultimately, city neighborhoods become the prize in a high-stakes poker game; the owners bluff their level of financial commitment to their property (willing to keep paying the fixed cost of ownership if they sense a city's desire to reclaim the property or redevelop the area), while the city hides its plans for redevelopment and reclamation (deciding how close a property owner is to defaulting on a piece of property to reduce reclamation costs).

II. Preliminary Data

Data for studies regarding abandoned land and/or structures suffers from inconsistencies with the definition of "abandoned" (Pagano & Bowman 2000). Survey designers must contend with the many different interpretations of "abandoned" that each city uses in its own audits. Cities' criterion includes length of vacancy, structural condition, and other subjective factors such as "imminent danger" to the community or threatens a city's "health and safety" (Pagano & Bowman 2000). Some cities use all of the above in making determinations on structures; others, such as Baltimore, for the most part, use only one to evaluate the status of a particular structure (Cohen 2001).

Michael Pagano and Ann Bowman of the Brookings Institution collected the data on abandoned structures used in this paper. They conducted a survey of 83 cities, gathering data on the city's population, land size, the amount of vacant land, and the number of abandoned structures per 1000 inhabitants.[1] The results revealed in this study were congruent with Cohen's article on Baltimore's abandoned city problem: Philadelphia, PA and Baltimore, MD led the category, with 36.54 and 22.22 abandoned structures per 1000 inhabitants respectively, while Detroit, MI was fourth at 9.74 structures per 1000 inhabitants, behind Kansas City, MO at 11.30, and slightly above Mobile, AL at 9.72. It is clear that Baltimore and Philadelphia are in an ignominious class of their own, having almost two and more than three times the number of abandoned structures per 1000 inhabitants than third place Kansas City. If we narrow our focus to Philadelphia and Baltimore, a large disparity still exists. Comparing the raw

[1] There are only 60 cities included in this study, due to lack of data from the original survey on the number of abandoned structures in particular cities, the most notable being New York, Seattle, Phoenix, and Atlanta.

numbers of these two cities, it can be seen that Philadelphia's population density is almost 37% higher than Baltimore's. A simple regression analysis of the 10 most populous cities in this study[2] indicates that population density is a significant predictor of the number of abandoned structures per 1000 inhabitants (F-value=16.49, R-Square=67.3%, Adj. R-Sq=63.3%). We can make an initial assumption from these results. Since higher population density correlates with more abandoned structures, we can conjecture that the population density figures calculated dividing a city's population by its land area is actually understated. The raw calculation takes into account the sum of a city's acreage, even in cities that have a high absolute number of abandoned structures (approximately 54,000 in Philadelphia's case). Even if these structures were single-family residences or other structures with small lot sizes, their sheer number would have a significant effect on a city's overall population density. Vacant land acres were not taken into account for this calculation for two primary reasons: first, data was unavailable for some of the cities in the study. Secondly, vacant land data is given in aggregate; land zoned as residential, industrial, or commercial is included in the final total, skewing the figures towards cities that are heavily zoned in one particular area.

[2] Baltimore (MD), Charlotte (NC), Columbia (SC), Jacksonville (FL), San Antonio (TX), San Diego (CA), San Jose (CA), Columbus (OH), Detroit (MI), Kansas City (MO), and Philadelphia (PA).

III. Results

With the general effect of population density established, we can begin analysis of other factors that may predict the rate of abandoned structures in a city. For this paper, I have chosen the following independent variables (in addition to population density) in a multiple regression model: the percentage of the city's population that are members of minority groups, the median income of city inhabitants, and the property tax rate (amount is measured per $1000 in property value). Below are the explanations for the significance of each variable:

- Median income per city (in thousands): Lower incomes in a city can lead to a wide variety of outcomes, including but not limited to: lower tax revenues, lower overall quality of housing, and lower property values. Thus, lower incomes should be predictive of higher rates of structural abandonment.
- Percentage of minority population: On average, members of the three major minority groups in the United States, African-Americans, Asian-Americans, and Hispanic-Americans, have lower median, mean, and per-capita incomes than white Americans.[3] Income disparities are larger between males of the particular races than females. This fact should be reflected in the median income per city. This variable is included to gauge the amount of "white flight" in a city i.e. the changing proportion of whites and minorities within a city's population. Indeed, in some cities included in the study, the "minority" population outnumbers the white population. A higher proportion of minorities in a particular city should predict a higher rate of abandoned structures in a city.

[3] Asian American males have higher median and mean incomes than white males, although per capita white male income is larger.

- Property tax rate per $1000 in property value: this value is included as an indicator of the cost-of-living in a particular city. What caused those rates is however, debatable. Do the higher tax rates evidence high property values? Or do they reflect increases made by a city government after large declines in population and therefore tax revenue? Low tax rates can also indicate large amount of abandoned structures, brought about by landlords' "option" strategy as explained by Benjamin Scafidi et al. (1998). In the proposed model, a landlord's decision likened as an investor's decision when dealing with options. Simply put, does the landowner pay taxes on a particular property or does he risk losing it by foregoing the taxes on it?

Table 1: Data Characteristics of 60 cities

Variable	Mean	Std. Dev	Minimum	Maximum
Median Income (thousands)	55.03	16.49	31.54	110.76
% Minority	38.45	16.53	4.50	87.70
Persons/acre	5.90	3.46	1.47	17.16
Tax Rate/$1000 property value	15.58	6.55	4.90	32.60
Aban. Structures/1000 pop.	2.63	5.75	0	36.54

Table 2: Regression coefficients and t-values

Constant	0.17478 (-0.05)
Median Income	-0.08498 (-2.12)
Percentage of minority pop. in city	0.07021 (1.69)
Persons per city acre	0.57833 (2.83)
Tax Rate per $1000 in property value	0.08802 (0.85)

n = 60
R-squared = 32.9%
Adj. R-squared = 28%
F- value = 6.73

(Median income and persons per city acre values are significant at the .05 levels. Percentage of minority population is significant at the .1 level)

Table1 shows the descriptive statistics for the variables of interest. The average number of abandoned structures (per 1000 inhabitants) for cities in the data set is 2.63. However, the number varies widely and some cities have no measurable number of abandoned structures. The results of the regression are show in Table 2. The results reasonably reflected expected results. The median income coefficient is negative, indicating that higher incomes predict lower abandoned structures per 1000 people. The percentage of minority population and population density figures are both positive, showing the anticipated effects of a dense population and higher proportions of minorities on the number of abandoned structures per 1000 city inhabitants. The R-squared (.3286) and Adj. R-squared (.2797) values indicate that the model explains a large portion of the dependent variable. The model's usefulness overall in explaining the number of abandoned structures in a city (per 1000 inhabitants) is evidenced by its F- value (6.73).

Of particular importance is the effect of population density on the rate of abandoned structures (one person more per acre increases the abandoned structure rate by .57). At the turn of the 20th century, cities were zoned with practical considerations in mind: industrial, commercial, and residential areas had to be reasonably close because of the lack of alternatives for transportation. The costs of living away from the city proper were just too large for the middle-class to justify the benefit.

As transportation technology improved in the early to mid-20th century (public transportation, affordable automobiles, improved roadways), the cost of living farther from the city was lessened. This allowed the largely white middle-class, who could afford transportation costs, to begin moving farther and farther away from the dense areas of the city. The housing stock built prior to the advent of the automobile revolution

became undesirable compared to spacious accommodations in the suburbs. Cities with very dense housing arrangements suffered more than those that had less dense arrangements.

The percentage of minority population variable has a slight effect on the rate of abandoned structures (.07 more abandoned structures per 1% increase of minority population). This suggests that the "white flight" phenomenon causes increases in the number of abandoned structures, but does not influence the abandoned structure rate as much as population density.

IV. Philadelphia's Case

Within the context of the regression model, there still exists no particular explanation for Philadelphia's staggeringly high number of abandoned structures per 1000 inhabitants. The model predicts that Philadelphia's abandoned structure rate should be 12.23, which shows a residual of 24.31 from the actual value of 36.54. This result indicates that there were other factors that were involved in Philadelphia's abandoned structure statistic.

What makes Philadelphia such an extreme case? In the past, housing was seen as an effect and not a cause of a city's decline (Accordino & Johnson 2000). As such, urban planners attempted to externalize the housing issue: measures were taken to increase demand for housing (city improvements, subsidized developments) rather than treating structural abandonment as a problem in itself (Accordino & Johnson 2000). An examination of Philadelphia's history shows how the demand side approach to housing abandonment would be ineffective. A typical solution to increase housing demand would

be to attract businesses, entertainment, and other enterprises. This approach doesn't address the core of the problem: the city's dense zoning, as well as the state of the existing housing stock. Attention must be given to changing layout of the inner city areas: replacing highly dense high-rise apartments and developments with more intimate town home-style apartments. Rents for these apartments can be subsidized by the city, funded by savings on law enforcement and increasing tax revenues from commercial improvements.

Metzger's paper on the Neighborhood Life-Cycle Theory suggests that choices regarding urban policy should reflect the particular "stage" of a neighborhood. The stage that much of inner-Philadelphia is in can be interpreted as somewhere between stage 4-5 (Accelerating Decline-Abandoned) as defined by the U.S. Department of Housing & Development (1975). Ideally, policy decisions should be made taking this ranking into account. For example, programs that attempts neighborhood revitalization as opposed to an external demand focus (attracting businesses and industries).

Table 3: The Dynamics of Neighborhood Change, U.S. Dept. of Housing and Urban Development

Stage	Characteristics
1 – Healthy	Homogeneous housing and moderate to upper income, insurance and conventional financing available.
2 – Incipient Decline	Aging housing, decline in income and education level, influx of middle-income minorities, fear of racial transition.
3 – Clearly Declining	Higher densities, visible deterioration, decrease in white in-movers, more minority children in schools, mostly rental housing, problems in securing insurance and financing.
4 – Accelerating Decline	Increasing vacancies, predominantly low-income and minority tenants or elderly ethnics, high unemployment, fear of crime, no insurance or institutional financing available, declining public services, absentee-owned properties.
5 – Abandoned	Sever dilapidation, poverty and squatters, high crime and arson, negative cash flow from buildings.

Nevertheless, we should be cautious about any solution to Philadelphia's abandoned housing problem based on the results of this study alone. Although the study identifies several key causes of abandoned structures, it fails to account for a large portion of the problem in Philadelphia. More research is needed to better understand the causes of Philadelphia's abandoned structure problem.

V. Conclusion

Using cross sectional data on abandoned structures in American cities, we find that population density exerts a significant positive impact on the abandoned structure rate. As transportation technology improved in the early to mid-20th century (public transportation, affordable automobiles, improved roadways), the cost of living farther from the city fell. This allowed the largely white middle-class, who could afford transportation costs, to begin moving farther and farther away from the dense areas of the city. The housing stock built prior to the advent of the automobile revolution became undesirable compared to spacious accommodations in the suburbs. Cities with very dense housing arrangements suffered more than those that had less dense arrangements. In addition, we find some evidence that white flight worsened the abandoned structure problem.

Nevertheless, the model does not fully account for the high number of abandoned structure in the city of Philadelphia. More work needs to be done. Factors other than economic should be considered. Socio-cultural, demographic, geographic, and chronological considerations should all play a role in the creation of public policy. Unfortunately, taxpayers want results quickly, and city governments, if they wish to remain in office, have no choice but to appease them. It is a hard reality that cities such as Philadelphia and Baltimore demand multi-faceted solutions that most planning boards cannot envision, and time horizons that most taxpayers cannot endure.

Works Cited

Accordino, J., & Johnson, G. (2000). "Addressing the Vacant and Abandoned Property Problem," *Journal of Urban Affairs* 22, 301-316.

Cohen, J. R. (2001). "Abandoned Housing: Exploring Lessons from Baltimore," *Housing Policy Debate* 12(3), 415-448.

Metzger, J. T. (2000). "Planned Abandonment: The Neighborhood Life-Cycle Theory and National Urban Policy" *Housing Policy Debate* 11(1) 7-40.

Pagano, M. A., & Bowman, A. (2000). Vacant Land in Cities: An Urban Resource: Brookings Institution Survey Series.

Scafidi, B. P., Schill, M. H., Wachter, S.M., & Culhane, D. P. (1998). "An Economic Analysis of Housing Abandonment" *Journal of Housing Economics* 7, 287-303.

Data Sources

U.S. Census Bureau: www.census.gov

U.S. Department of Housing and Urban Development: www.hud.gov

MSN Neighborhood Advisor: www.homeadvisor.com

Regressions were run using SAS v8.