TEARING THE CITY DOWN: UNDERSTANDING DEMOLITION ACTIVITY IN GENTRIFYING NEIGHBORHOODS

RACHEL WEBER, MARC DOUSSARD, SAURAV DEV BHATTA, AND DANIEL MCGRATH
University of Illinois at Chicago

ABSTRACT: *We estimate the probability that a residential building in a gentrifying neighborhood will be demolished, situating the decision within a context of consumer preferences, neighborhood change, and public policy. We perform a logit analysis of address-level data for every privately initiated demolition permit issued in three Chicago community areas between 2000 and 2003. We find that smaller, older, frame buildings with less lot coverage had a greater probability of being demolished during this period. Political jurisdiction and socioeconomic factors, other than the change in Hispanic population, were less important than expected. Demolished structures were located in appreciating areas, further away from Tax Increment Financing districts. We speculate that this popular redevelopment tool has been used in areas with primarily commercial land uses on the periphery of residential neighborhoods and that rent gaps are reduced by the negative externalities associated with conflicting land uses.*

put the city up; tear the city down
put it up again; let us find a city.

Carl Sandburg, "The Windy City"

Despite the fact that demolitions remake the urban landscape on a daily basis, little scholarly attention has been directed toward understanding this form of creative destruction.[1] The lack of attention is due partly to the fact that demolitions are rarely treated as an end unto themselves, but more as a prelude to redevelopment or vacant land, both of which have been studied more extensively. As Bender (1979) pointed out, the long-run equilibrium models of housing production favored by economists tend to ignore the short-term removal of suboptimal stock.

The incidence of demolition, however, is important in and of itself. Demolition has the potential to eliminate buildings of historic, cultural, and architectural importance, some of which are viewed as playing a role in maintaining the physical coherence of neighborhoods. To witness an act of demolition is to watch the built environment change shape in

Direct Correspondence to: Rachel Weber, 412 South Peoria (MC 348), University of Illinois, Chicago, IL 60607. E-mail: rachelw@uic.edu

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an instant. Harris noted, "Nothing better reveals the linkages made . . . between building and human life cycles than the powerful emotions raised by the expiration of a structure's time on earth" (1999, 117).

Demolition activity is associated with specific geographies. For example, demolitions intended for immediate building replacement (what is referred to as a "teardown") take place in residential neighborhoods undergoing "gentrification." In such cases, demolition is part of a dynamic process whereby space is revalorized as new construction facilitates the capitalization of rising land values. Theories of urban redevelopment suggest that such revalorization is a neighborhood-scaled phenomenon; that is, the profit margins on new construction would lead to the wholesale rebuilding of the built environment in neighborhoods where land values are rising at a certain pace. If this is the case, what explains the relative obduracy of certain buildings in gentrifying neighborhoods? Why are teardowns common yet not entirely ubiquitous? What kinds of buildings have the highest probability of being demolished in such communities? These are important questions to answer as community organizations, policymakers, and developers face off in battles over neighborhood character and housing affordability around the country.

In this article, we answer these questions by identifying the determinants of residential redevelopment in the three Chicago neighborhoods that experienced the majority of demolition activity during the 1990s. Therefore, our focus is on those demolitions that are initiated by profit-maximizing property owners, as opposed to those that result from administrative fiat (e.g., nuisance properties demolished by city governments). Previous studies that explain demolition activity are marred by confusion about the different kinds of demolitions and the inability to distinguish between those that are publicly as opposed to privately initiated. Moreover, earlier studies focus either exclusively on the choice to demolish one single parcel or on variation in demolition rates for entire neighborhoods. In contrast, we have access to a unique data set of building-level characteristics and so can examine the impact of different structural, neighborhood, demographic, and policy factors on individual properties. Using a logit analysis to estimate the probability that a residential building in these neighborhoods was demolished, we find that although building characteristics are the most robust predictors of demolition, public policy can play an important role.

DEFINING DEMOLITION

The process of demolition is relatively straightforward: contractors remove buildings using specialized equipment and skilled manual techniques. Although most associate the wrecking ball and explosives with the demolition process, these techniques are reserved for buildings over four stories (Liss 2000). The majority of demolitions are much smaller in scale, and contractors use hand tools such as jackhammers to dismantle buildings. Within a few hours, a single-family house can be reduced to a hundred tons of rubble and debris, which is then hauled away for recycling or disposal. The process and cost differ based on the use of the building (whether it is residential, commercial, or industrial), the type of construction, the presence of hazardous materials, and the building's proximity to infrastructure and adjoining and adjacent structures. In 2002, the cost of demolishing a single-story house ranged from \$4,000 to \$8,000 or approximately 1–2% of total development costs for the new construction (Kamin and Reardon 2003; Rosenthal and Helsley 1994).

Even though we examine only the demolition of residential buildings, these demolitions too vary according to the time frame for redevelopment, identity and motivation of their owner, and their geography. For example, some buildings are severely dilapidated and virtually uninhabitable before they are demolished. Although redevelopment of the resulting vacant site does not typically occur within the short term, the motivation of the property owners may not be the generation of profit but rather the elimination of a nuisance. Bender (1979) referred to this kind of demolition as an "abandonment" demolition. He found that abandonment demolitions took place within neighborhoods with declining or stagnant population, income, and property values, and where large amounts of vacant and underused land were concentrated.

In contrast, "teardown" demolitions precede the rapid redevelopment of a site. Defined by the National Trust for Historic Preservation as "the practice of demolishing an existing house to make way for a dramatically larger new house on the same site" (Fine and Lindberg 2002, 1), teardown demolitions often remove buildings that are otherwise habitable.

Both public agencies and private individuals act as landlords and demolish their holdings. The public sector generally responds to concerns for community health, safety, and welfare. Municipalities demolish privately owned residential buildings if they are abandoned or present immediate or future hazards, such as fire-related damage or excessive code violations (Cohen 2001). Local government agencies also demolish their own inventories of institutional buildings, such as schools or fire stations, to clear the land for new uses.

In this article, we focus on the private demolition decision whereby property owners demolish buildings in response to their own profit-maximizing calculus. Only in very rare instances would a private absentee owner who did not intend to rebuild respond to public or community pressure to demolish a building that has become a nuisance (i.e., an abandonment demolition). Even in such cases, the satisficing landlord would demolish when the value of the vacant land outweighs the value of a potentially hazardous structure whose maintenance costs, property taxes, and insurance liability are high. Households may demolish and redevelop their own homes, contracting with a builder to reconstruct the house. More commonly, a developer will purchase the original property without intending to live in the building, but rather to demolish it and sell the new building to new owners.

EXPLAINING TEARDOWN DEMOLITIONS

The Rent Gap

Demolitions are likely to occur when the difference between a property's value in its redeveloped state and its value in its undeveloped state, minus the costs associated with redevelopment (which include the cost of demolition), is greater than zero. Political economists refer to this differential as a "rent gap" and have noted that demolition is one kind of "spatial fix" that prepares land for conversion to higher and better uses when this gap is sufficiently large (Harvey 1989; Smith 1996). Similarly, neoclassical economists have modeled the role of the "value differential" in the redevelopment decision. Braid (2001), Brueckner (1980), and Wheaton (1982), for example, provided theoretical models of urban spatial growth based on different assumptions about the ability of developers to predict future change (i.e., whether they are myopic or act with perfect foresight) and whether population change is endogenously or exogenously determined.

Both schools of thought start from the basic assumption that a building's ability to generate rents depends on the fluctuating value of two elements: the improvements (i.e., physical structure or nonland capital) and its location. The improvements will deteriorate in quality over time and, ceteris paribus, its market value will depreciate. Although improvements require ongoing maintenance and investment to counteract the effects of time, the value of the land is not dependent on its upkeep. Instead, land prices increase with location-specific demand, which most models assume, is positively related to proximity to the central business district (CBD) and other urban features. Demolition therefore is likely to take place when the value of improvements approaches zero or decreases relative to the value of the land.[2] In other words, undermaintained properties near the CBD that have not capitalized their potential ground rent are likely candidates for demolition. If improvements are highly valued relative to the land they sit on, they may be too expensive for developers to purchase and discard. Anecdotal evidence suggests that developers will demolish a building if, in constructing and selling a new dwelling in its place, they are able to make three times the acquisition costs (i.e., the "Rule of Three") (Fine and Lindberg 2002).

Economists have found widespread evidence that the value differential accounts for redevelopment activity. Using data on single-family home sales in Vancouver, Rosenthal and Helsley (1994) found support for the hypothesis that demolition takes place when the sale price of a property that is purchased specifically for redevelopment is equal to the price of vacant land (plus the cost of demolition, which the authors assume is zero). Munneke (1996) found that indeed the value differential determined the decision to redevelop commercial and industrial properties in Chicago. Hufbauer and Severn (1973) found that changes in a city's population density and housing preferences influence demolitions; as a city seeks to house more people, ground rents rise, and landlords realize a profit by replacing small buildings with larger ones. They suggested that, all things being equal, a threefold increase in ground rent would persuade an owner to demolish a single-family home, providing confirmation for the Rule of Three.

These studies provide evidence that property owners are rational agents, despite lacking perfect information about future value differentials when they originally made the decision to demolish. Owners must rely on the existence of market stimuli that signal potential land appreciation in the local environment. Smith pointed out, "It would be . . . irrational for a housing entrepreneur to maintain a building in dilapidated condition amid widespread neighborhood revitalization and recapitalization" (1996, 191). In cases where local property values are rising rapidly, demolition or speculation would be a more reasonable response.

If demolition is the rational response to rising land values, what explains the relative obduracy of certain buildings in neighborhoods where the profit margins on new construction should precipitate a mass clearance and rebuilding of the built environment? Because teardowns appear to take place in a piecemeal basis in appreciating areas, we suspect that there is an underlying spatial logic at work that is related to specific building characteristics and the microgeographies of neighborhood change. Previous studies of redevelopment have ignored many of these social and political factors, and it is to them that we now turn.

Teardowns and Gentrification

Teardowns are a physical indicator of gentrification, a process whereby previously disinvested neighborhoods with older housing stock experience new private-sector-initiated development accompanied by an inflow of households with higher socioeconomic status than the initial residents (Nelson 1988). Land rents rise as a result of the increased demand, and the possibility of involuntary tenant displacement increases. Demolitions both capitalize on and contribute to rising land prices whose value outpaces the older, often undermaintained building stock.

The National Trust for Historic Preservation has documented more than a hundred communities in twenty states that experienced a significant increase in teardown activity in the 1990s (Fine and Lindberg 2002). Most of these communities are gentrifying urban neighborhoods, such as University Park in Dallas and sections of East Denver. Even within gentrifying neighborhoods, however, teardown activity takes place in a varied manner at the block level, where older rehabilitated buildings sit next door to new construction. This implies that value differentials are not homogeneous within neighborhoods, something that previous studies of demolition (e.g., Bender 1979) ignore by examining the neighborhood as the unit of analysis. Bender's dependent variable—the fraction of a community area that has been demolished between 1966 and 1971—does not capture any variation within neighborhoods, which is often larger than the variation across neighborhoods.[3]

Some of this variation may be due to the cultural affinities of property owners. Patterns of housing consumption are determined to some extent not only by the high incomes and purchasing power of the in-movers but also by their particular social attributes and lifestyle decisions. Sociological studies of gentrifying neighborhoods suggest that demolitions are primarily initiated by a new breed of urban in-mover and by the developers who cater to them (Betancur 2002; Mele 2000; Smith 1996; Smith and DeFilippis 1999). Many of these households are employed in the CBD, and proximity to work is a primary reason for their urban residential location (Spain 1989). They tend to be upper-income empty-nesters or couples with few or no children. If these in-movers prefer to live in more racially homogeneous neighborhoods, demolitions will be more likely in areas that are or are becoming less diverse (regardless of land values).

Some new households may prefer the larger-sized units (with master suites, expansive kitchens, and other space-consuming features) and modern architecture that come with new construction (Langdon 1991).[4] Much of the urban in-fill housing in gentrifying neighborhoods has tried to keep pace with the suburban "McMansion" trend where large, tract-style homes have replaced older, smaller ones (Perlman 1998). In other cases, however, gentrifying consumers with similar household income are more interested in the "vintage" of historic buildings and prefer rehabilitated homes to new construction. These distinctions are important social markers (Bourdieu 1987) and potentially one of the explanations for the variation in demolition activity within gentrifying neighborhoods.

By focusing solely on the preferences of housing consumers, however, we may ignore the ways in which the ability of property owners to maximize their return from redevelopment is both constrained and encouraged by the activities of the public sector. Political economists point out that collective social action at the local level—the activities of powerful landed capital (developers, realtors, and mortgage lenders) and the local governments that preserve their interests—produces or supplies certain kinds of space (see, e.g., Harvey 1973; Smith 1996; Wyly and Hammel 1999). For example, federal urban renewal policies were very successful in encouraging demolitions in American cities during the 1960s and 1970s by allowing land "write-downs" (the sale of publicly owned properties for below-market prices). Other contemporary demolition incentives include strategic public investment in neighborhoods that are upgrading, streamlining the demolition- and construction-permitting process, and zoning codes that allow for high-density buildings in low-density neighborhoods (Betancur 2002; Kennedy and London 2001; Smith 1996).

By contrast, other kinds of collective social action can discourage demolition activity. Local government's ability to regulate land uses and zoning creates the parameters in which property owners pursue rents. Developers may be unable to maximize building size if they are unable to assemble large parcels to meet set-back requirements or zoning regulations that regulate the allowable height of buildings and lot coverage. Municipalities may also charge high fees for demolition permits or make the process so time-consuming as to be expensive. In some cities, historic preservation commissions may delay or prohibit demolition if they determine that a structure has historic or architectural importance (Perlman 1998).

Our study assesses and compares the different economic, political, and sociological explanations for demolition activity. Although economic explanations tend to ignore the fact that consumer preferences take shape within a social and political context, the political and sociological explanations tend to be either purely theoretical or case studies of single neighborhoods. We seek to test different hypotheses put forth in the literature by examining empirical evidence from the City of Chicago.

The Case of Chicago

We chose Chicago as a case study for several reasons. In some ways, the city is exceptional. A survey of nine major cities revealed that Chicago was considerably more active than the others in terms of the absolute number of demolition permits issued in the second half of the 1990s (Weber and Pagano 2002). In the ten years from 1993 to 2002, private individuals, developers, and public agencies combined applied the wrecking ball to approximately 3% of the city's building stock.[5]

In other ways, Chicago is the prototype for older, densely developed cities that underwent a noticeable revitalization in the 1990s. During this decade, Chicago experienced its first net inflow of population since the 1940 Census. As in other urban centers, however, housing demand was concentrated in specific neighborhoods, which saw a rapid appreciation of land values, whereas other areas experienced sustained disinvestment. Fueled by an increase in population and growing household income, large swaths of the city were transformed over the decade by the demand for and supply of elite neighborhoods.[6]

Chicago's city government has relied heavily on spatial policies, such as Tax Increment Financing (TIF) and "Fast-Track" demolition permitting, that some blame for the marked increase in residential redevelopment. Moreover, elected aldermen, and not professional administrators, control access to demolition permits in their wards. Approximately 13.4% of the city's area fell within TIF districts in 2002 (Neighborhood Capital Budget Group 2003). Although primarily used in commercial areas, TIF has been accused of encouraging the rapid appreciation of property and concomitant demolition activity (Hardy 1999).[7] The potential positive impact on demolition is because the municipality and the developer benefit most from this incentive when the rent gap is greatest over the shortest period of time. Demolition can quickly reduce the value of a property by eliminating all improvements, and if a new higher-valued structure is rebuilt on the remaining vacant land in an area with increasing demand, the "tax increment" (difference between property taxes on the original and redeveloped property) can be used by the municipality to pay for the costs of redevelopment in the district instead of being channeled into the general fund. One would also expect that properties located in proximity to a TIF district would be affected by the redevelopment activity taking place there (i.e., spillover effects) and may themselves be demolished. The degree to which TIF and other policies lay the groundwork for demolition activity or simply follow in its wake has not been adequately analyzed.

For our study, we focus on a group of three community areas where approximately 20% of the city's total teardown activity took place during the study period (Figure 1).[8]

Lincoln Park, West Town, and Logan Square are three community areas that met our neighborhood selection criteria: (a) they experienced 1990–2000 changes above city averages in those demographic indicators most closely associated with gentrification (Table 1);[9] (b) they were home to both the highest absolute numbers of private demolitions and highest ratio of demolitions to the number of properties by community area during the period 2000–2003; and (c) newspaper accounts and prior studies have singled them out as gentrifying or gentrified (e.g., see Lloyd 2002; The Voorhees Center for Neighborhood and Community Improvement 2001). Moreover, in a previous study of

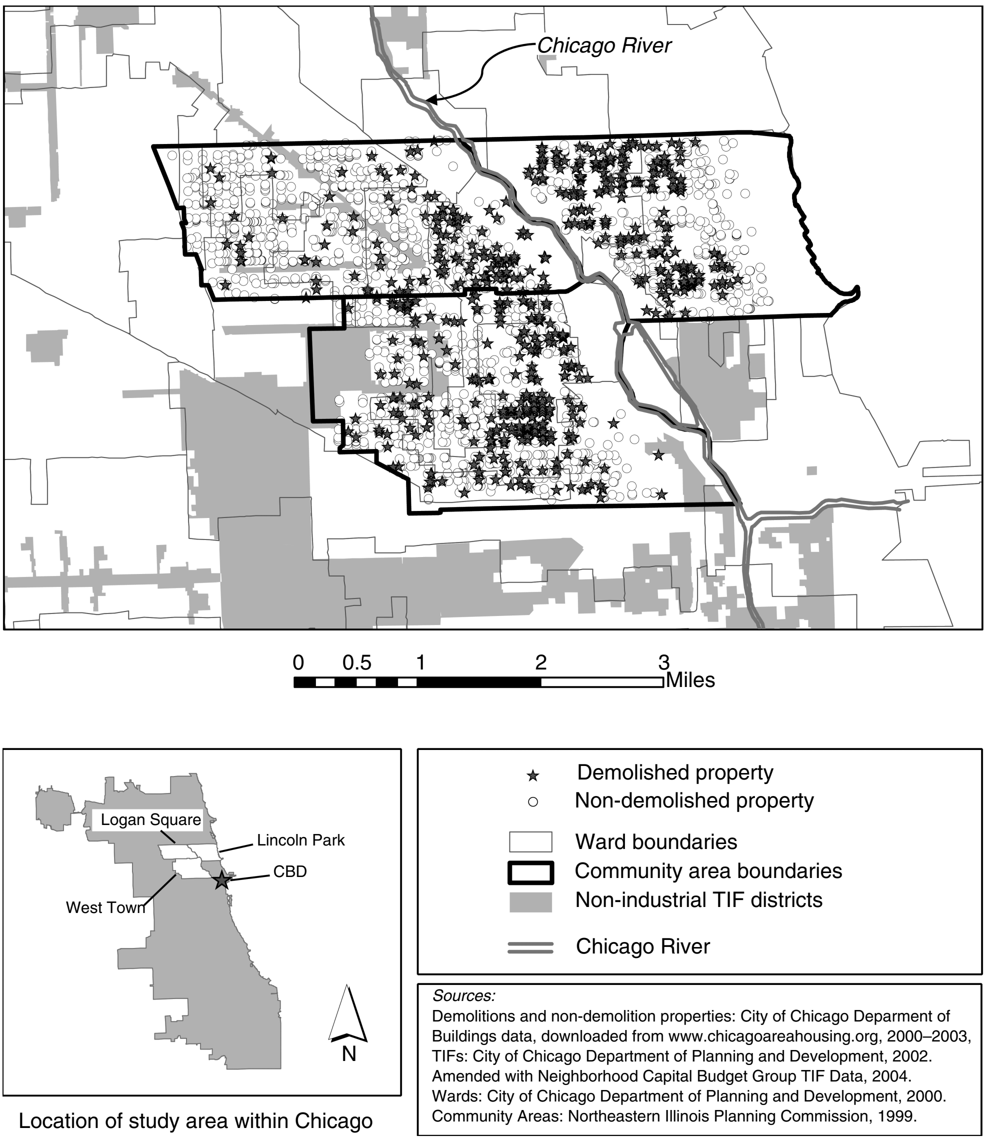

FIGURE 1
Demolished and Nondemolished Properties in Sample Chicago Community Areas, 2000–2003

TABLE 1
Gentrification Factors in Selected Community Areas

Demographic factor	Relationship to gentrification*	Percent change, 1990–2000			
		Chicago	Lincoln Park	West Town	Logan Square
Percent white (non-Hispanic)	+	−17	−1	43	−2
Percent black (non-Hispanic)	–	−4	−12	0	−4
Percent Hispanic (all races)	–	33	−22	−24	−2
Percent children (age 5–19)	–	14	10	−27	−11
Percent elderly (age 65+)	–	−13	−15	−18	−21
Percent managers and professionals	+	4	4	59	32
Percent adults with college education	+	34	14	194	93
Median house value (2004)	+	26	−8	19	33
Percent owner-occupied housing	+	7	23	24	4
Median family income (2004)	+	4	32	44	15
Percent families below poverty	–	−9	−31	−42	−26
Percent female-headed households with children	–	23	−24	−25	−17

*See Hudspeth and Smith (2004).

renovation activity in Chicago (conducted for the period 1995–2000), the author's model seriously underpredicted renovation activity in these community areas, suggesting that unobserved attributes contributed to the attractiveness of reinvestment there (Helms 2003).

Indeed, the visual signs of gentrification in these densely developed neighborhoods beyond teardown activity are hard to overlook: expensive condominiums and new high-end retail districts in what were three decades ago more modest neighborhoods. All three neighborhoods, however, have retained some of their older building stock, most constructed in the early decades of the twentieth century, and have landmarked some of the more exceptional examples.[10] Several TIF districts are located in or nearby these three neighborhoods.

We also selected these neighborhoods because of the potential for variation in residents' housing consumption patterns. Located on the shore of Lake Michigan, Lincoln Park experienced gentrification first, in the form of racial transition during the 1970s when highly educated, non-Hispanic whites moved into a neighborhood with a sizable Mexican-American and Puerto Rican population. Although artists were originally attracted to the stately graystones, the "bohemian" phase was a short one as land prices climbed quickly, and the majority of tenants moved further north and west. In 2000, residents had some of the highest incomes in the city.

Encompassing the neighborhoods of Wicker Park, East Village, Ukranian Village, and Bucktown, the community area of West Town sits two miles from both Lake Michigan and the Loop. Until the late 1980s, this area was an enclave of light industry and white ethnic labor, cut off from the wealthier Lincoln Park by high-rise public housing, the Chicago River, and the Kennedy Expressway. During the 1990s, the area became celebrated as the city's center of alternative culture. Artists and media workers found the area's urban grit glamorous and exciting. The slightly dilapidated built environment served as a resource in the area's transformation requiring "neither a massive clearing project bulldozing material relics of industry or a wholesale erasure of local history" (Lloyd 2002, 521). Indeed, Lloyd (2002) made the point that residential rehabilitation (the "adaptive recycling of urban space"), not demolition, was the motivation of the residents attracted to the area. In the late 1990s, signs of a more mainstream consumer culture were becoming evident, as was the greater incidence of demolitions. Moreover, the aldermen of the wards covering this area have developed a reputation for allowing developers and property owners to demolish their holdings.

As housing values and rents in West Town escalated during the 1990s, many of the neighborhood's prospective residents moved west to Logan Square. In the early 1990s, Logan Square was a majority-Hispanic neighborhood that had experienced an earlier round of decline in both population and housing units. There had been little new construction in the area: of the 29,800 housing units in the neighborhood in 1990, only 3% had been built since 1980. In the 1990s, white renters and homeowners began moving into the southeast portion of the neighborhood, and by 2000, real estate publications were touting the neighborhood's "artistic" and "eclectic" feel, much as they had in West Town a decade earlier (Chicago Home 2003). Despite the addition of new housing units, Logan Square has reinvented itself more slowly and less completely than West Town and Lincoln Park. The area's median household income rose just 15% during the 1990s (compared with 32% and 44% of Lincoln Park and West Town, respectively).

The choice of these three proximate but culturally differentiated neighborhoods allows us to test the notion that demographic attributes and political designations (e.g., wards) factor into the decision to demolish. Was a building located in "bohemian" West Town less likely to be demolished than a similar building in "yuppie" Lincoln Park? Were some aldermen more or less sympathetic toward demolition? Our statistical model, discussed in the following section, allows us to investigate the microgeographies of redevelopment so that we may identify distinguishable patterns underlying the short-term removal of housing stock.

MODELING AND ESTIMATION FRAMEWORK

We are interested in evaluating the different explanations for teardown demolitions. As the decision to demolish is a binary-choice process (where the choice is between demolishing and not demolishing the property), we must use a suitable nonlinear function of the explanatory variables to model the probability that a property owner demolishes his/her property (Aldrich and Nelson 1984). In this article, we use a nonlinear, logistic function to model the demolition decision. The dependent variable is the probability that a parcel has been demolished, a decision that is influenced by a vector of variables that explain the demolition decision.[11]

The coefficients associated with the independent variables are estimated using a Weighted Maximum Likelihood method (Ben-Akiva and Lerman 1995). Because a stratified sample is used in data collection (as we explain in the next section), such a method applies weights to the likelihood function values of each observation. Using the standard Maximum Likelihood method to estimate the coefficients of a binomial logit model in the case of a choice-based stratified sample would result in biased and inconsistent coefficients. The dependent variable used in the estimation is $Demolitions_i$, which takes the value 1 if the property has been demolished and 0 otherwise. The explanatory variables, which reflect the various explanations for demolitions discussed above, are described in detail in the next section.

The statistical significance of the coefficients indicates whether the corresponding explanatory variable is significantly related to the dependent variable. These coefficients cannot, however, be directly compared with each other to infer the relative importance of the different independent variables in explaining the probability of demolition. One way of making such inferences is by computing corresponding standardized coefficients and comparing them instead. The standardized coefficients for our model can be obtained either by estimating our equation using standardized values for the explanatory variables[12] or by estimating our equation in the existing form and transforming the coefficients appropriately. We present comparisons of standardized coefficients as part of our results.

It should be noted that, unlike in linear regression models, the vector of coefficients in our equation does not represent the marginal impacts of changes in the explanatory variables. As the demolition probability is a nonlinear function, the marginal impacts are different for different values of the explanatory variables.[13] We present marginal effects and standardized coefficients in the *Estimation Results* section.

DATA AND VARIABLE DESCRIPTIONS

Dependent Variable

We obtained address-level information for every residential demolition permit issued in our three community areas by the City of Chicago's Department of Buildings for the period between January 2000 and December 2003. This data set contains information on the building address, owner, and date of permit issuance for every legal demolition performed in Chicago over this four-year period.[14] Looking at this relatively short time frame allows us to avoid most business cycle factors such as changes in interest rates and construction costs. Moreover, this time period allows us to treat prior decennial change in census data between 1990 and 2000 as exogenous variables determining the probability of demolition and to therefore avoid the possibility of endogeneity in the model. Using a short time frame, however, also limits the generalizability of one's findings.

We restricted our demolition data to those where a private party initiated and obtained the demolition permit. Publicly initiated demolitions are more likely to be abandonment-type demolitions, and not teardowns, because of the City of Chicago's policies toward "nuisance" properties (Weber and Pagano 2002).[15]

Of the 1,242 recorded private residential demolitions in the study area, we were able to match 1,148 (93%) to a database of property records maintained by the private company Experian.[16] This database provided information on building characteristics, land uses, and assessed values for each structure before the demolition permit was issued. We deleted 122 observations that the more-detailed land-use data revealed to be nonresidential and 200 observations where multiple properties were listed at the same street address (in the event that these were single condominiums in a multiunit building). Eliminating forty-one observations for which data values were missing left us with a total of 785 demolition permits.

To select a control group of nondemolished buildings, we chose a random sample of 2,500 residential properties in the study area, also from Experian, whose addresses could not be matched to the demolition permit data. After removing incomplete observations, we obtained a final count of 2,007 observations. This produced a final sample of 2,708 properties, 28% of which had been demolished at one point during the study period (Figure 1).[17] The final sample can be considered a "choice-based stratified sample" in that the population of parcels has been partitioned into two collectively exhaustive subsets, namely a set of demolished parcels and a set of nondemolished parcels, and samples have been extracted from both strata. As such, the Weighted Maximum Likelihood function is the most appropriate functional form for data analysis (Ben-Akiva and Lerman 1995).

Explanatory Variables

Our theoretical discussion implies that the demolition decision depends primarily on the utility provided by the structure and its proximity to amenities, neighborhood identity, political factors, and the degree of land value improvement expected over time. As such, our explanatory variables can be grouped into five broad categories that might influence these factors—building characteristics, location characteristics, real estate variables, demographic characteristics, and political jurisdiction. These characteristics alter the price that the property owners will pay and hence indirectly enter into the demolition probability function by influencing revenue expectations from redevelopment. The means and standard deviations of variables used in the analysis are presented in Table 2.

Building Characteristics

If the demolition decision is based on the gap between the value of a property as presently constituted and its value after significant transformation, any existing physical trait that makes the property less desirable will increase the size of this gap and make demolition more likely. Older homes are more likely than modern buildings to be functionally obsolete (e.g., because they were built with higher ceilings and smaller-sized rooms) and to require expensive maintenance and upgrading (Bullock 1996)—although Rubin (1993) demonstrated that unit age is itself a “pure” housing attribute (in that it is independent of physical condition). Bender (1979) and Rosenthal and Helsley (1994) found a positive relationship between building age and demolition. We similarly expect that older buildings (*AGE*) will be significantly associated with the likelihood of demolition. In our sample, the average demolished building is approximately fourteen years older than the average nondemolished building. Additionally, we expect that frame buildings (*FRAME*) are better candidates for demolition, due to their lower demolition costs and the fact that they show their age more than masonry construction. In our sample, 58% of demolished parcels were of frame construction in contrast with 39% for nondemolished properties.

An owner’s ability to maximize the value of his/her property is also heavily dependent on a building’s size. We have documented the usable floor space (*BLDGAREA*) of the properties in our study, with the expectation that larger buildings produce more value on a square foot basis than smaller buildings and are therefore less likely to be demolished. Demolition costs are also likely to rise as the building size increases, acting as a disincentive for demolition. However, a property’s value depends on the relationship between the size of the improvements and the size of the lot on which it sits. A small building on a large lot has not capitalized the full value of the land and may lead to demolition to increase its area, whereas a small building on a small lot may be more appropriately sized. Accordingly, we have also included the ratio of living area to lot size (*AREARAT*), with the expectation that a lower ratio increases the probability of demolition.

Subdivision of a structure into smaller income-generating units could compensate for small building size and less-intensive lot coverage so that buildings with a higher number of units (*UNITS*) may generate higher rents than similarly sized single-unit buildings and be less susceptible to demolition. By contrast, gentrification often involves a demolition of multiunit buildings to make way for single-family homes.

TABLE 2
Descriptive Statistics

	All properties		Nondemolished		Demolished	
Variable	Mean	SD	Mean	SD	Mean	SD
AGE—Building age in years	95.44	29.28	94.83	34.38	109.23	5.84
FRAME—1 if the construction type is frame, 0 otherwise	0.401	0.488	0.393	0.565	0.583	0.187
BLDGAREA—Building area in square feet	2,503	1,888	2,535	2,226	1,798	318
AREARAT—Building-to-land area ratio	0.802	0.470	0.812	0.552	0.572	0.097
UNITS—Number of units in building	2.775	3.707	2.817	4.387	1.824	0.383
DISTCBD—Distance to central business district in miles	3.696	1.026	3.716	1.200	3.237	0.268
DISTCTA—Distance to nearest CTA station in miles	0.527	0.296	0.531	0.346	0.449	0.092
DISTLAKE—Distance to Lake Michigan in miles	2.688	1.080	2.711	1.259	2.182	0.323
DISTIF—Distance to TIF in miles	0.418	0.309	0.411	0.357	0.577	0.114
DISTIFSQ—$DISTIF^2$	0.271	0.343	0.264	0.395	0.422	0.138
EAV97—Area equalized assessed value in 1997 in nominal dollars	42,957,686	34,714,914	42,530.501	40,095,007	52,654,080	14,398,128
CHGEAV—Percent change in EAV from 1989 to 1997	245.4	149.9	243.2	173.2	296.4	060.8
POP00—Census tract population in 2000	3,527	2,042	3,554	2,397	2,900	504
PCPOP—Percent change in census tract population 1990–2000	0.021	0.150	0.021	0.172	0.017	0.070
HHINC99—Median household income in 1999	51,675	25,033	51,329	28,903	59,516	10,351
PCINC—Percent change in household income 1989–1999	0.371	0.371	0.366	0.427	0.481	0.165
OWN99—Percent homeownership in 1999	0.314	0.111	0.313	0.128	0.336	0.046
PCOWN—Percent change in homeownership 1989–1999	0.057	0.202	0.054	0.232	0.126	0.094
COLL00—Percent college educated in 2000	0.412	0.255	0.407	0.296	0.516	0.089
PCCOLL—Percent change in college educated 1990–2000	1.751	2.322	1.745	2.704	1.887	0.834
HISP00—Percent Hispanic in 2000	0.421	0.274	0.426	0.318	0.305	0.090
PCHISP—Percent change Hispanic	−0.148	0.247	−0.144	0.288	−0.241	0.085
WARD26—1 if in Ward 26, 0 otherwise	0.167	0.372	0.171	0.436	0.064	0.093
WARD32—1 if in Ward 32, 0 otherwise	0.222	0.414	0.216	0.476	0.361	0.183
WARD35—1 if in Ward 35, 0 otherwise	0.154	0.360	0.159	0.424	0.041	0.075
WARD43—1 if in Ward 43, 0 otherwise	0.154	0.360	0.152	0.416	0.197	0.151
Total observations	2,705		1,920		785	

Location Variables

Traditional models of urban structure posit a strong relationship between access to the CBD and land values (Alonso 1964). Such theories predict that the residential bid-rent function decreases monotonically with distance from the CBD. To account for the impact of this feature on demolition, we measured the distance of all parcels in miles to the corner of State and Madison streets, the base point for Chicago's street numbering system (*DISTCBD*). All else being equal, proximity to this point should increase the probability of demolition.

Unfortunately, monocentric models (i.e., those that measure the distance to one urban center) will not adequately capture location-specific demand for housing in cities like Chicago. In a metropolitan region with widely dispersed transit connections, architecturally distinct areas, suburban job centers, and other features that are not centrally located, neighborhood factors unrelated to the proximity to downtown are likely to be critical to the redevelopment decision. Therefore, we have included distance to a prominent natural feature in a flat and densely developed city: Lake Michigan (*DISTLAKE*) whose shoreline is highly valued by Chicagoans. In our sample, demolished properties are closer to both Lake Michigan and the CBD than nondemolished properties are. We also include distance to closest public transit stop (*DISTCTA*), assuming that commuters value this proximity and that housing values may be more likely to increase near this infrastructure.

We used GIS software to plot our sample on an electronic map of Chicago's TIF districts obtained from the Department of Planning and Development. TIF funds can be used to finance demolitions for large-scaled redevelopment projects, and so we might expect a higher probability of demolition for properties inside the district. However, the eleven TIF districts that were in the general vicinity of our sample community areas are predominantly commercial and mixed-use districts, with a small number of residential properties located within their boundaries. Indeed, only twenty-seven properties from our sample fell within TIF districts.

The underlying theory about the impact of spatial economic development policies, however, would suggest the presence of potent externality (or contagion) effects should the policy draw in new development. As such, we measure each property's distance to the closest TIF district that existed before the study period (*DISTTIF*). The average property was 0.46 miles away from a TIF. Distances ranged from 0 (where the parcel was either located on the boundary of the TIF or within the TIF) to 1.4 miles away. Because this relationship could be a nonlinear one (e.g., the slope could be steeper near the district), we also include a quadratic variable, the squared of this variable (*DISTTIFSQ*), to capture potential nonlinearity.

Neighborhood Real Estate Variables

The Office of the Cook County Assessor maintains records of individual land values but admits that these are very rough estimates—often simply calculated by taking 20% of the total value of the property. As such, we opted for data that reflect the value of land and improvements within a very small geography, a quarter-mile section, which is a one-half mile by one-half mile area often used for planning and geographical analysis of the Chicago metropolitan area. Property value data by quarter-mile section were provided by the Office of the Cook County Clerk. Teardown demolitions tend to take place in neighborhoods with increasing property values and population (Langdon 1991). Changes in the equalized assessed value between 1989 and 1997 in the associated quarter-mile section (*CHGEAV*) and the initial section *EAV* (*EAV97*) give us some indication of change in the surrounding property values in the decade before the period in question. The average change in microarea values for demolished parcels was 296%, whereas for non-demolished parcels it was 243%. However, it is possible that demolitions are less likely in areas where values were initially high and where the majority of buildings had already been upgraded to reflect increasing ground rents. Therefore, we may expect to see a negative relationship between the initial value and the probability of demolition.

Neighborhood Demographic Variables

Even though the three community areas in our sample may appear at first to be homogeneously white and wealthy, demographic distinctions between these areas may capture the differences in perceived identity and the phase of gentrification. Demographic data are derived from 1990 and 2000 Census data for each of Chicago's census tracts. Following Galster (1987), who identified educational attainment as the central demographic variable associated with gentrification, our model emphasizes college education over other demographic factors (*COLL00* and *PCCOLL*).[18] On the one hand, we would expect that these variables will be positively correlated with demolition because more-educated individuals may have more wealth and more expensive tastes. On the other hand, educated individuals are often active in historic preservation movements, may prefer rehabilitated older structures, and may organize to prevent demolitions. For example, Lincoln Park, a Chicago neighborhood with one of the highest percentage of college-educated residents, also has the highest share of buildings designated historically significant in the city (City of Chicago 2002).

Wealthier property owners possess the capital necessary to redevelop property. As such, we would expect the change in area median household income to be positively related to demolition (*PCINC*). Areas that were already high income may be the more stable and therefore less likely candidates for demolition. We might expect a negative relationship between demolitions and median household income in 1999 (*HHINC99*). We also include information about the population in 2000 and change in population between 1990 and 2000 (*PCPOP* and *POP00*) in each census tract to control for overall population and population change.

It is also possible that different forms of housing tenure affect the likelihood of demolitions. Homeownership rates may both reflect the wealth and access to credit of the current population and signify their lack of interest in significant physical transformation. We include the initial value and change in census tract owner-occupancy rate from the 1990 and 2000 Census (*OWN99* and *PCOWN*). Demolitions are performed by both absentee landlords and owner-occupiers. We lack information about the tenure of individual properties but know that the mean occupancy rate was higher in Lincoln Park (40%) than in Logan Square and West Town (31% and 29%).

Race may impact development in ways that go beyond household income and earning power. Developers catering to white in-migrants may view a decrease in the share of racial minorities in a neighborhood as a signal of future positive change. By contrast, McMillen (2003) found that census tracts with a higher proportion of Hispanic residents experienced faster growth in house prices, which may lead to an increase in demolitions. We include initial level and change in Hispanic residents (*HISP* and *PCHISP*) for each census tract.

Political Jurisdiction

Finally, in Chicago, aldermen wield a substantial amount of power over the issuance of demolition and building permits. Buildings that are considered "landmarks" for the City's purposes must receive approval from an alderman to demolish. The law provides the local alderman with ten days in which to approve a demolition permit, and if there is sufficient community opposition, he/she may turn it down. Some aldermen are perceived to be more "pro-development," whereas others may be more interested in historic preservation. Therefore, we include dummy variables for political ward (each of which elects a separate alderman) to determine whether the political preferences of the alderman influence the ability to demolish a property. Our sample fell into six wards. None of our observations fell in Ward 31 (which overlapped with only a few blocks of our study area), and so we omitted it. To avoid perfect multicollinearity, we do not include a dummy variable indicating location in Ward 30.

ESTIMATION RESULTS

The results from our logit analysis are presented in Table 3. Each of the five regressions shows the relationship between the listed explanatory variables and the probability of demolition. Starting with parcel characteristics in Model 1, we have progressively added other categories of explanatory variables in specifications 2–5. Model 2 adds location variables, including TIF-related distance variables; Model 3 adds neighborhood real estate variables; Model 4 adds demographic variables; and Model 5 adds political jurisdictions. The pseudo-R^2 values range from 9.8% to 19.6%, indicating that the explanatory power of each of the models is relatively high.[19]

As can be seen from the significant coefficients on *AGE* and *AREARAT* in Model 1, older buildings with low capital intensity have a higher probability of being demolished. These two explanatory variables continue to have statistically significant relationships with the probability of demolition in specification 2 as well. Additionally, the construction type (*FRAME*) of the building is also significantly associated with demolition in specification 2—consistent with expectations, frame buildings are more likely to be demolished than nonframe buildings. Note that the coefficients on *AGE*, *AREARAT*, and *FRAME* remain statistically significant in the remaining regressions as well.

The relationship between the location variables and demolitions in specification 2 is largely consistent with our expectations. All else being equal, the probability of demolition decreases the further away a building is from Lake Michigan and from the closest public transit stop (*DISTCTA*). But although the coefficient on the distance to the CBD has the expected negative sign, it is not statistically significant.

The explanatory variables in specification 2 include the parcel's distance from the closest TIF district (*DISTTIF*) as well as the squared of this variable (*DISTIFSQ*). The positive and significant coefficient on *DISTTIF* contradicts the conventional wisdom that TIF leads to more demolition activity; this redevelopment finance mechanism appears to discourage proximate residential redevelopment. This may be because the TIF districts in our study area were designated to encourage commercial investment along the area's main thoroughfares. The negative externalities associated with competing commercial land uses (traffic congestion and noise) may be more responsible for the diminished probability of residential demolitions near such areas than the actual policy tool. Observe that the coefficient on *DISTIFSQ* is negative, indicating that the rate of increase in demolition probability decreases with distance from closest TIF. But the statistical insignificance of the coefficient suggests that the nonlinearity in the relationship between demolition probability and distance to TIF is not significant.

TABLE 3
Weighted Logit Analysis of Demolished and Nondemolished Properties
Dependent Variable: Demo 1 If Demolished Property, 0 Otherwise

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	−6.0275	−2.8216	−3.749	−4.2973	−4.3316
	(1.0157)***	(1.1455)**	(1.3599)***	(1.8421)**	(1.8781)**
AGE	0.0385	0.0204	0.0206	0.0222	0.0217
	(0.00887)***	(0.00683)***	(0.0067)***	(0.00687)***	(0.00684)***
FRAME	0.1653	0.4236	0.4666	0.473	0.4996
	(0.2077)	(0.2159)**	(0.2165)**	(0.2304)**	(0.2325)**
BLDGAREA	−0.00007	0.000057	0.000126	0.000123	0.000132
	(0.000223)	(0.000217)	(0.00022)	(0.000225)	(0.000226)
AREARAT	−1.3449	−2.4117	−2.5488	−2.5385	−2.5494
	(0.6226)**	(0.6426)***	(0.6522)***	(0.6667)***	(0.6694)***
UNITS	−0.0771	−0.1084	−0.1142	−0.1002	−0.1033
	(0.1419)	(0.1357)	(0.1354)	(0.136)	(0.1358)
DISTCBD		−0.2186	−0.2001	−0.2198	−0.3719
		(0.1609)	(0.1959)	(0.2215)	(0.2634)
DISLAKE		−0.8313	−0.7498	−0.6877	−0.6692
		(0.4495)**	(0.4855)	(0.5757)	(0.6335)
DISTCTA		−0.3253	−0.1625	−0.1195	−0.0274
		(0.1751)**	(0.3419)	(0.4256)	(0.4479)
DISTTIF		3.6236	2.8421	3.3824	3.291
		(1.2934)***	(1.4486)**	(1.5464)**	(1.6008)**
DISTIFSQ		−2.1599	−1.567	−1.8532	−1.7724
		(1.036)	(1.1067)	(1.1932)	(1.2212)
CHGEAV			0.151	5.77E−04	−1.42E−02
			(0.0907)*	(0.1284)	(0.1302)
EAV97			7.736E−09	5.561E−09	6.127E−09
			(5.73E−09)	(6.92E−09)	(7.01E−09)
PCPOP			0.0575	0.1972	0.2935
			(0.6889)	(0.9287)	(0.9511)
POP00			−0.00008	−0.00007	−0.00005
			(0.00008)	(0.000102)	(0.000101)
PCINC				−1.76E−01	−2.56E−01
				(0.3511)	(0.3541)
HHINC99				−0.00000785	−0.00000832
				(0.000008044)	(0.000008314)
PCOWN				−0.061	0.155
				(0.6959)	(0.7141)
OWN99				0.0819	−0.2713
				(1.88)	(1.9064)
PCCOLL				0.0058	−0.00065
				(0.0735)	(0.0757)
COLL00				1.2977	1.5765
				(1.8799)	(2.0225)
PCHISP				−1.3999	−1.1646
				(0.697)**	(0.7505)
HISP00				0.5087	1.2581
				(1.4956)	(1.6778)
WARD26					−0.1172
					(0.5441)
WARD32					0.5058
					(0.4774)

WARD35					−0.0157
					(0.6349)
WARD43					0.2046
					(0.7007)
Observations	2,708	2,708	2,708	2,705	2,705
Pseudo-R^2	0.098	0.179	0.187	0.194	0.196

Note. Standard errors in parentheses; * denotes significance at 10%; ** denotes significance at 5%; *** denotes significance at 1%. Weight values: if Demo = 1, Weight = 0.144412. If Demo = 0, Weight = 1.340189.

Specification 3 is similar to specification 2 except for the addition of neighborhood real estate variables.[20] The results for this specification are largely consistent with those obtained above in terms of the signs and significance of the coefficients. But *DISTLAKE* and *DISTCTA* are no longer significantly related to demolition, suggesting that the real estate variables explain part of the variation in demolitions explained earlier by the location variables. Among the real estate variables included in specification 3, the only variable with a statistically significant relationship with demolition probability is the appreciation in surrounding property values (*CHGEAV*). The positive coefficient on this variable suggests that higher area appreciation rates are associated with an increased probability of demolitions.

Model 4 includes census tract demographic variables in addition to the explanatory variables discussed above. The results for the building and location variables are similar to our previous findings. But the inclusion of demographic variables eliminates the significance of *CHGEAV*, the only real estate variable that had a statistically significant coefficient in specification 3. The results of Model 4 suggest that the probability of demolition is higher in areas with decreasing shares of Hispanics (*PCHISP*). Contrary to expectation, however, the percentage of people with college degrees does not have a significant relationship with demolition probability.

Model 5 attempts to capture the influence of the political preferences of aldermen by adding dummy variables identifying the parcel's ward. Contrary to our expectations, none of the coefficients on the ward dummies is statistically significant. Note that the inclusion of these policy variables eliminates the significance of PCHISP, suggesting some degree of multicollinearity between demographic variables and political ward. The other results, however, remain unchanged.[21]

Table 4 presents the marginal impacts and standardized coefficients of the five statistically significant explanatory variables for Model 3. Recall that the standardized coefficients

TABLE 4
Parameter Marginal Impact Analysis of Model 3

Model 3 significant variables	Estimated parameter	Standardized parameter	Sample mean/starting value	Numerical increment	Increment description	Change in probability of demolition (%)
AREARAT	−2.5488	−0.6610	0.802	0.080	10% increase	−0.319
DISTIF	2.8421	0.4843	0.418	0.125	1/8 mile or 1 city block	0.729
AGE	0.0206	0.3330	95.440	10.000	Decadal increase	0.392
FRAME	0.4666	−0.2964	0.000	1.000	Nonframe to frame	0.847
CHGEAV	0.1510	−0.2333	2.454	1.000	100% point increase	0.280

from the regression can be compared to determine the relative importance of the different explanatory variables. The variables in Table 4 are therefore listed in descending order according to the magnitudes of their standardized parameters. This ranking indicates that the most important determinant of demolition is the parcel's building-to-land-area ratio. Interestingly, the distance to the closest TIF—our main policy variable—is the second most important determinant. It is followed by two other parcel characteristics, namely building age and structure type. The neighborhood real estate variable *CHEAV* ranks last in this list.

The marginal impacts listed in the table represent the change in probability of demolition when the associated explanatory variable increases from its mean value by one unit. The unit differs depending on the variable. For example, the increment for *AREARAT* is 10% of the mean value, whereas that for *AGE* is ten years. In the case of the dummy variable *FRAME*, by contrast, the marginal impact is computed as the increase in demolition probability when *FRAME* is changed from 0 to 1. The increment used for *DISTIF* is one eighth of a mile (0.125 miles)—the distance of one standard city block in the City of Chicago. Keeping these increments in mind, the numbers presented in Table 4 can be interpreted as follows. An increase in the parcel's building-to-land-area ratio by 10 percentage points beyond the mean ratio of 0.80 decreases the probability of demolition by 0.32%, assuming there are no changes in the other variables. Similarly, when the distance to the closest TIF increases by a city block beyond the mean distance, the parcel's probability of demolition increases by 0.73%. An increase of ten years in the age of the building from the mean age of ninety-five years increases the probability of demolition by 0.34%, whereas a frame building has a 0.847% higher probability of getting demolished compared with a nonframe structure. A 100% increase in the quarter-mile section *EAV* change is associated with an increase of 0.28% in the probability of demolition.

CONCLUDING ANALYSIS

Redfern (1997) argues that the existing research on gentrification fails to convincingly link the mechanisms of housing transformation to broader theoretical perspectives on neighborhood change. On the side of housing supply, rent-gap research often proves to be nonfalsifiable, deducing the existence of a rent gap from empirical indicators of gentrification. On the side of housing demand, Redfern argues that changes in individual preferences cannot by themselves explain the mass transformation of the housing stock in gentrifying areas. In response to these empirical problems, Redfern suggests a greater focus on the intricacies of housing production.

Although the results presented here only apply to one aspect of housing production—the demolition decision—they bring new insights to this debate. In particular, our logit results suggest that the rent gap is correlated with specific building characteristics. During the period from 2000 to 2003, smaller, older frame buildings with less lot coverage had a greater probability of being demolished. Our findings confirm those of Rosenthal and Helsley (1994), Munneke (1996), Helms (2003), and other more qualitative characterizations of redevelopment and gentrification in general.

Although almost all of the building-specific variables are significant, the "distance to closest TIF district" variable accounts for much of the model's predictive power. The public policy context of neighborhood change therefore is an important piece of the model, although in a different way than might be expected. The consistently significant and positive coefficient on *DISTTIF* suggests that this policy overlay either suppresses nearby redevelopment activity or, true to its intended purpose, includes lower-value (i.e., blighted) commercial areas. In our study area, TIF boundaries have been drawn around struggling commercial thoroughfares with the intention of encouraging retail development there. Proximity to disamenities associated with commercial land uses, such as noise and congestion, may outweigh the potential amenities of convenience shopping. These TIF districts may not have been successful at encouraging the kinds of retailers that redevelopers and new residents demand (i.e., chain retail stores and restaurants; see Lees 2003), so that there is less cachet in a proximate residential location.

Given that the majority of the TIF districts in the study area were on the periphery of our three neighborhoods, the positive and significant coefficient on this variable could also imply that demolition is a more common occurrence near the residential "cores" of gentrifying neighborhoods than on its fringes. After twenty-five years of in-migration by professionals, it would be reasonable to expect demolition patterns to spread out from the center of Lincoln Park and toward the edge. Our results suggest that this did not occur during our study period. If this is a consistent phenomenon in each of our sample neighborhoods, it might suggest that the potential for profit remains rooted to the residential center regardless of an area's distinct "phase" of gentrification.

Finally, neither the demographic variables nor the political jurisdictions had much predictive capacity compared with the other building- and location-related variables. We speculated that our three community areas—Lincoln Park, West Town, and Logan Square—had distinct identities and likely attracted residents with different tastes for new construction (as opposed to rehabilitation of older structures). Our findings suggest that the decision to reside in one of these three community areas is not a strong predictor of demolition. There may not be enough variation in the educational makeup, housing tenure, or income of households in these neighborhoods to be a driving force behind demolition activity, or that these social indicators alone are not predictive of taste. Similarly, ward politics appears to explain little of the variation in demolition. Individual aldermen may feel pressured to conform to the dominant pro-development stance of the long-standing mayor of Chicago, Richard M. Daley. Organizations fighting for building preservation may not have been able to make inroads with them.

The one demographic variable that appeared to have an effect, although inconsistent, was the percent change in the Hispanic population between 1990 and 2000. Neighborhoods whose share of Hispanics decreased between 1990 and 2000 were candidates for demolition activity. This finding may be associated with the documented displacement of Hispanic residents by white residents through such processes as the conversion of multifamily rental properties to condominiums (The Voorhees Center for Neighborhood and Community Improvement 2001).

Building characteristics, changes in ethnicity, and presence near the residential core of a neighborhood may provide the best "early warning" signals of future physical change in gentrifying areas. Our study does not weigh in on the question of whether demolitions have a positive or negative impact on neighborhood well-being. If neighbors or local officials are opposed to such changes, several policy options exist to potentially curb the pace at which buildings are retired. Restrictions on new construction (floor-area ratio limits or design review) and higher fees for demolition permits are becoming increasingly popular tools for challenging the decisions of real estate investors.

Moreover, the linkages between public policies and demolition suggest that community coalitions and others interested in slowing the pace of demolition should focus on more general development policies in addition to those directly associated with historic preservation. Although building characteristics play a central role in determining the probability of demolition, escalating land values also provide a central impetus to replace old—and in the eyes of many, "vintage"—buildings with newer housing stock. Although TIF may not be an effective means of raising land values, other policies for which we could not control, such as zoning that strictly separates land uses, may be. To this end, efforts to restrict demolition activity may be most effective when coupled with broader efforts to contest city policies that promote spikes in residential property appreciation.

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ENDNOTES

1 Recent work on the topic tends to be historic and descriptive (for an excellent example, see Page 1999).

2 Wheaton (1982) solved for the tipping point: that is, the amount by which the value of land would have to increase for redevelopment to occur as well as the amount by which the value of the nonland capital would have to increase (due to reinvestment) if the value of land remained the same to stave off demolition.

3 Moreover, aggregation problems prevent the author from measuring the relationships between demolitions and individual building characteristics, such as building age and condition. Bender's study is also dated, having been conducted at a time (1966–1971) when the majority of the city's neighborhoods were rapidly losing population.

4 The average size of a new home in the United States rose dramatically in the last half century, from 1,000 square feet in 1950 to 1,500 square feet in 1970 to 2,265 square feet in 2001 (Fine and Lindberg 2002).

5 Aggregate data from the City of Chicago's Department of Planning and Development show 15,970 demolition permits issued between 1993 and 2002 and a total of 602,887 properties in the city in 1993. Our calculated demolition "rate" does not take into account the possibility that some of the permits may be issued for properties that had been demolished and rebuilt within this time period.

6 At the same time, sixty-five of Chicago's seventy-seven community areas did *not* experience the demographic trends associated with gentrification (Hudspeth and Smith 2004). In fact, several became poorer and more segregated between 1990 and 2000.

7 State legislation lists those costs that can be paid for with TIF increments. In Illinois, as in most states, demolition is considered an "eligible cost."

8 Community areas are aggregations of adjacent census tracts that have loosely defined Chicago's neighborhoods since the 1930s. Calculations are for total demolitions in the period 2000–2003.

9 These include change in median house value, median family income, and percentage of white residents, managers and professionals, adults with college education, and owner-occupied housing (Hudspeth and Smith 2004).

10 Historic designation status has been sought aggressively in two of the three community areas in the study. On the basis of the data provided by the City of Chicago's Department of Planning and Development, Landmarks Division, we calculate that 17.6% of the residential properties in West Town, 13.1% of the residential properties in Lincoln Park, and 4.0% of the residential properties in

Logan Square have been designated as having "historical or architectural importance." Although the high rate of formal historical designation in West Town and Lincoln Park demonstrates the existence of efforts to record the design value of these buildings, the designation itself does not protect against demolition and is thus excluded from the regression analysis below.

11 The equation can be modeled as $P_i = e^{\mathbf{X}_i\mathbf{B}}/(1 + e^{\mathbf{X}_i\mathbf{B}})$ where P_i is the probability that parcel i is demolished, $\mathbf{X}_i$ is a vector of variables that explain the demolition decision, and $\mathbf{B}$ is a vector of coefficients associated with $\mathbf{X}_i$.

12 The standardized value of X_i^k is equal toX_i^k/σ_k, where σ_k is the standard deviation of X^k.

13 For example, the marginal impact of an increase in the k^{th} independent variable X^k on the probability of demolition is given by $P_i(1 - P_i)\beta^k$, where β^k is the coefficient associated with X^k. Clearly, because P_i depends on the values of the variables $\mathbf{X}_i$, the marginal impact of X^k will depend not only on β^k but also on $\mathbf{X}_i$. The marginal effect $P_i(1 - P_i)\beta^k$ can be derived by taking the derivative of our equation with respect to X^k.

14 The Department of Buildings estimates that one of every five demolitions in the city takes place illegally, i.e., without proper permits (Kamin and Reardon 2003).

15 If privately owned properties are severely deteriorated and present hazards to the tenants or community, the City will obtain a court order to demolish the building and the demolition permit will be recorded as one for a publicly owned property. The City pays for the demolition and will seek to recover the costs incurred by filing a lien on the property and obtaining personal judgments against the responsible parties. If, after filing the lien, the municipality has not received payment from the responsible parties, it will foreclose on and take legal possession of the property.

16 The 111 demolished properties that could not be matched to the larger data set were mapped to ensure that no spatial bias was introduced into the sample. The unmatched parcels were similar to the sample properties in terms of geographic distribution and mean demographic and property-valuation values.

17 No observations in the sample had been demolished more than once during the study period.

18 This focus also proved helpful in selecting a set of explanatory variables that minimized multi-collinearity. We omitted several other variables associated with gentrification (e.g., percent change in female-headed family household, percent change in children as a portion of the population, and percent change in African-American population) that were too strongly correlated with those measuring education, income, race, and household composition.

19 Results from previous studies using similar data had pseudo-R^2 statistics below 3% (Helms 2003).

20 It should be pointed out that a structure's probability of demolition could also be influenced by the general demolition trend in the locality. But capturing the influence of such "demonstration effects" is difficult because of problems in constructing appropriate indicators of these effects. As the indicator would have to reflect the demolition trend *prior* to the actual demolition activity, constructing an indicator for nondemolished parcels is not straightforward. For example, in the case of a demolished property, the number of demolitions (say in the previous year) in the area prior to the date of demolition of that property could be used as an indicator of demonstration effects. But because there is no date of demolition associated with a nondemolished parcel, it is not clear which dates should be used to compute the *past* demolition trend for nondemolished parcels.

21 We also ran a regression where dummy variables representing the three community areas of interest to us—Lincoln Park, Logan Square, and West Town—were included among the explanatory variables instead of the ward variables. The coefficients on these community area dummies were not significant, and the results for the other variables were the same as those obtained in specification 5.

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