Construction Quality, Externality, and Community Competitiveness

A Study of Masonry Ordinances in Chicago's Suburbs

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Abstract

This study addresses the issue of whether and how some suburbs' regulation of construction quality has affected their competitiveness in the metropolitan development process. Specifically, it examines the use of masonry ordinances as a way of development quality control by some fast growing suburbs. Often used as an architecture standard or design guideline, this ordinance requires the use of a certain percentage of masonry cladding on newly constructed buildings. By examining more than a decade’s practice of masonry ordinances in two Chicago suburbs, this study finds that these ordinances are associated with a significantly positive increase in local property values and an expanding local tax base. In fact, the two masonry ordinance suburbs have outperformed many of their neighbors in the same metropolitan area on various indicators examined. Findings also suggest that these ordinances did not discourage growth. Rather, in an era in which construction quality is often undervalued, such regulation has made these communities distinctive and has attracted quality growth.

1. Introduction

After World War II, the United States experienced suburbanization of a magnitude and speed surpassing any other nation (Mieszkowski and Mills, 1993). In most American metropolitan areas, this process is characterized as “urban sprawl” and is viewed as socially undesirable, since the spatial expansion has far exceeded what is needed to keep up with population and economic growth (Brueckner, 2001).

With the seemingly endless opportunity for greenfield development in America’s suburbs, the long-term investment horizon that used to feature real estate and urban development no longer exists in development industry. Retail malls, office buildings, and residential communities are being built rapidly, experiencing frequent turnover, and becoming physically and economically obsolete in a short period of time. Many developers and builders now share the view that today’s development projects have much shorter economic lives than their predecessors. “Over the past two generations, what for 5,000 years had been a 40-year asset class has been reduced to a seven- to ten-year economic lifespan for most projects” (Leinberger, 2003, p 96).

Metropolitan development is in continuous pursuit of new frontiers. Once a property reaches the end of its economic life, the convention in our society is simply to leave it behind and move to the next frontier. Catering to such customs, many developers have abandoned far-sighted, socially responsible growth for quick development and profits (Hayden, 2003). Few of them are interested in creating enduring communities, communities that would remain as physically and economically attractive places to live

for generations to come (Prince of Wales, 2005)[1].

Unfortunately, the shortened economic life of a metropolitan area's physical assets not only wastes resources, but also leads to the accelerated depreciation of our existing cities and suburbs. Many communities that drew high market demand in the 1980s now have to deal with miles of low-occupancy or abandoned strip malls and declining housing values (Leinberger, 2003). The social and economic costs associated with such transitions are enormous, such as a shrinking local tax base, declining quality of municipal service, concentration of poverty, and the segregation of income and racial groups (Squires, 2002; Jargowsky, 2002).

Efforts to prevent or ameliorate these problems have been focused primarily on policy reform with higher-level governments. Federal housing and infrastructure policies, for example, have favored new development over reinvestment, subsidizing consumption instead of preservation. Without a fundamental change in such policy preferences, it is hard to imagine that the outward movement of metropolitan development can be stopped. Other efforts to limit sprawl range from the call for regional governance to the adoption of strict growth control policies.

Missing from the debate, however, is any discussion of what local communities, particularly young, still developing suburbs can do to extend their communities'

[1] A Talk by The Prince of Wales in Acceptance of the National Building Museum's Vincent Scully Prize. Thursday, November 3, 2005. National Building Museum. http://www.nbm.org/Events/news/prince_charles_accepts_scully_prize.pdf

economic lives and reduce the future risk of decline. In view of the rapid deterioration of many inner-ring suburbs, some young suburbs have realized that the newness that now attracts growth can fade quickly. They have become concerned about whether they will face a similar destiny as these inner-ring suburbs when development spins further outward. This is a justified concern because in the United States, the structure of government system determines that local governments have to compete with each other for population and business (Tiebout, 1956; Shannon, 1991). If a suburb is no longer attractive, the economic resources easily move to other jurisdictions in the metropolitan region. In light of this concern, some young suburbs began to implement development regulations in order to maintain their future attractiveness and to ensure that the community's residential and commercial tax base would not be lost to the new urban frontier.

There are, unfortunately, almost no studies of such efforts (Lang, Blakely and Gough, 2005). Despite the plethora of suburbs in this country, planners have paid little attention to their struggles, much less helped them achieve a more sustainable future. On the other hand, development regulations enacted in the suburbs are also likely to be dismissed by planners as being exclusionary and discriminatory. For example, there is a consensus among scholars that many suburban land use regulations such as minimum lot size requirement withdraw land from the building supply, reducing the affordable housing supply, and excluding low-income residents (Levine, 2005; Pendall, 2000; Quigley and Rosenthal, 2005).

Given the variety of regulations local governments can employ, including building codes, environmental laws, land use regulations etc., it is not justified to treat all of them equally without examining their independent benefits and costs (Schill, 2005). Moreover, dismissing local regulatory policies altogether shuts down an opportunity to understand suburban development. Since suburban development affects millions of Americans, "it is time to take suburbs seriously, examining them socially, economically, and politically from the ground up" (Lang, Blakely and Gough, 2005, p. 388).

This study is a move toward this direction. It investigates whether and how suburbs' regulation of construction quality has affected community competitiveness in metropolitan development. An example of this type of planning regulation is a masonry ordinance. Often used as an architectural standard or design guideline, masonry ordinances require the use of a certain percentage of masonry cladding, such as brick or stone, on newly constructed buildings in the community. To this author's knowledge, more than one hundred suburbs in the country have passed this type of regulation, and most of them are located in the Midwest, Southern, and Southwestern United States. These suburbs often have one thing in common: growth. In fact, many of them are very fast-growing suburbs. Growth pressure, combined with the rising concern about development quality, as well as the long-term livability of communities, has motivated these suburbs to adopt masonry ordinances.

Because a masonry ordinance regulates only exterior wall materials, it may appear to be trivial compared with well-studied regulations such as zoning and density restrictions that

directly affect the location and quantity of new development. Nevertheless, studying the impacts of masonry ordinances has important planning implications. First, enacting a masonry ordinance signals a renewed interest in construction quality in suburban development, which, as mentioned earlier, has often been undervalued in the United States. Second, because masonry ordinances regulate the appearance of all new structures, it affects our perception of these suburban communities. In fact, the visual impact is dramatic. Maguire et al. (1997) argue that there is a link between everyday visual experience and community sustainability; thus physical design and aesthetic character constitute an important influence on community development[2]. This study can serve as an empirical test of their argument.

Specifically, this study examines masonry ordinances as a form of planning policy in two Chicago suburbs where the ordinances have been in place for over a decade. It investigates two research questions. First, how has the adoption of a masonry ordinance affected households' willingness to pay for living in these communities? To answer this question, the study compares the property values in the masonry communities with property values in nonmasonry communities that are otherwise similar. (A masonry community refers to a municipality with a masonry ordinance. A nonmasonry community refers to a municipality without a masonry ordinance.) Second, what community-wide impacts have resulted from implementing a masonry ordinance? To address this question,

[2]The importance of building outlook is often implicitly mentioned in the affordable housing debate. Historically, the bad design and ugly outlook of public housing properties have been cited as one reason for the failure of the public housing program. More recently, stories have repeatedly been told about how well-designed affordable housing projects have been successfully integrated into suburban neighborhoods. One widely accepted principle is that we should build affordable housing in such a way that it can not be distinguished from other market housing by its outlook. With this principle in mind, a recent affordable housing development in a wealthy neighborhood of Montgomery County (Maryland) has applied traditional brick architecture to make the affordable housing units look as decent as other properties in the neighborhood (Rawls, 2005).
http://www.palmbeachpost.com/business/content/business/epaper/2005/11/13/a1f_montgomery_1113.html

the study examines how masonry communities perform relative to their neighbors in terms of economic health and growth, with economic health measured by the community's fiscal revenue-generating capacity. This study also addresses other community concerns such as the restriction on new development and housing affordability.

This report is organized into six sections. The next section discusses why local governments enact development regulations and, in particular, the justifications for a masonry ordinance. The third section discusses the methodology used to select the Chicago metropolitan area and case-study communities. The fourth section presents the property value analysis of the selected communities. The fifth section presents the community-wide impact analysis. The final section concludes.

2. Rationale behind the Masonry Ordinance

To study masonry ordinances, the first challenge is to understand why local governments would want to enact them. What are the benefits of regulating the exterior material of local properties? Why not let the private market make the choice of how to build homes and businesses? To answer these fundamental questions, this section first examines the justifications for local development regulations and then explains how masonry ordinances match these justifications.

Local governments enact development regulations for a variety of reasons. The most important reason is to promote the health, safety, general welfare of local residents, and an overall quality of life in communities. Over a century ago, in response to unhealthy living conditions in many Americans cities, the tenement housing reform movement was initiated in order to push the regulations of health and sanitation, as well as the fire safety aspects of housing development (Listokin and Hattis, 2005). As a result, local building codes and housing standards were adopted across the country, such as the mandatory use of fire-retardant materials.

Safety and health are not the only motives. Many local governments enact regulations to address market failure, in particular, the externality issue (Schill, 2005). Externality refers to situations in which one's actions affect the welfare of others, but one does not take such impacts into consideration when making decisions. Externality can either be positive or negative. Zoning, for example, is adopted to separate different types of land uses in

order to prevent the negative externalities, such as nuisance and pollution, among incompatible land uses. On the other hand, development activities that generate positive externalities that benefit the neighborhood, such as good maintenance, may be undersupplied since the property owner cannot capture the external benefits and would not produce to a level that is socially optimal. As a result, local governments may intervene to encourage such activities (Mills, 1979). Development guidelines or architectural standards also fall into this category since they promote high-quality development that generates positive neighborhood effects (Schill, 2005).

The importance of externality to local governments' regulatory decisions cannot be overstated given the dominance of property owners in American society. Most American households rely on homeownership for wealth accumulation and are sensitive to changes in property value. Property owners respond especially strongly to any likely negative impact on their property value. Bond and Coulson (1989) posit that homeowners' fear about negative externality, together with the high mobility in our society, can lead to dramatic neighborhood change. For example, when a neighborhood ages and some properties start to show signs of dilapidation, concern about property value decline may arise, which may motivate some residents to move out. This would reinforce the fear and push more residents to move out. Properties in the neighborhood begin to be sold at a discount and the negative externality effects are aggravated. A healthy middle-income neighborhood may soon turn into a declining low-income neighborhood. Although this theory has been criticized for being too deterministic, it does help explain the "white flight" phenomenon observed in many central city and inner-ring

suburban neighborhoods. Such fears about the long-term durability of their communities have driven some fast-growing suburbs to regulate exterior building materials using masonry ordinances.

There are several explanations of why some suburbs would want to promote masonry over other cladding material such as vinyl or wood. The first is the fire safety consideration. Masonry has a better fire safety standard than vinyl or wood. Communities in the Chicago metropolitan area, for example, have strongly preferred masonry to alternative materials in response to the Great Chicago Fire of 1871. In this respect, a masonry ordinance promotes safety and health. A second justification for masonry is maintenance. Compared with some alternative materials, masonry cladding, which does not require periodic painting or replacement, has better durability and lower maintenance costs. This benefit not only accrues to individual property owners, but also to the community, since the community image would not easily decline due to insufficient property maintenance. The third explanation focuses on architectural aesthetics and appearance, another source of externality. Regarded as a "warm" material for its color and texture, masonry is often used by architects to enhance a sense of belonging or contextualization and is favored for its visual appeal.

The above discussion shows that a masonry ordinance can be advocated on the grounds of fire safety and externality, but does not guarantee that the ordinance would be a good regulation. The existence of externality needs to be proved, and its magnitude needs to be measured. Further, even if a regulation has the benefit of reducing negative

externality or promoting positive externality, it may impose costs in other areas. For example, many development regulations may restrict housing supply and increase housing cost. For a regulation to be economically efficient, the benefits must exceed the costs. Finally, the distributional consequence must also be considered (Schill, 2005). A regulation may be efficient, but it may lead to undesirable distributional consequence if the costs are borne by disadvantaged groups. In these cases, additional government actions may need to be taken to remedy this effect.

3. Selection of Case-Study Metropolitan Areas and Masonry Communities

Masonry ordinances are most commonly implemented in suburbs in the Midwest, Southern, and Southwestern United States. To select study suburbs that would yield findings of national relevance, a two-step approach was followed. First, among all metropolitan statistical areas (MSAs) known to have a prevalence of masonry planning policies, including masonry ordinances, researchers identified the MSA whose recent social and economic development trends are the closest to the national average among all MSAs. A dissimilarity index was developed for each MSA that measures how far this MSA is from the national average. To create this index, a series of social and economic indicators were evaluated against the national average trend, including variables such as population growth rate, income growth rate, employment growth rate, price appreciation rate, and rent growth rate. All data comes from the 1990 and 2000 United States Census. The following formula shows how the dissimilarity index was calculated.

$$\text{Dissimilarity Index in MSA i} =$$
$$\left(\frac{\text{Population Growth Rate in MSA i - National Average Population Growth Rate}}{\text{National Average Population Growth Rate}}\right)^2 +$$
$$\left(\frac{\text{Income Growth Rate in MSA i - National Average Income Growth Rate}}{\text{National Average Income Growth Rate}}\right)^2 +$$
$$\left(\frac{\text{Employment Growth Rate in MSA i - National Average Employment Growth Rate}}{\text{National Average Employment Growth Rate}}\right)^2 +$$
$$\text{.....}$$

Table 1 presents the dissimilarity index for all MSAs with masonry ordinances. It is clear that the Chicago MSA, with the lowest dissimilarity index, is the closest to the

national average development trend. Interestingly, further analysis of the Chicago MSA reveals that this area is also noted for a strong historic preference for masonry properties. There are currently at least 12 suburbs in Chicago areas that have implemented masonry ordinances, from Naperville with about 130,000 residents to Homer Glen with only about 1,200 residents.

Out of all Chicago suburbs that have enforced masonry ordinances, the Village of Orland Park and the Village of Tinley Park were selected as the case-study communities for this study. Both communities enacted the ordinance over a decade ago and have experienced massive development since. As a result, the impact of the masonry ordinances is expected to be significant.

Table 1: Social and Economic Development Trends in MSAs with Masonry Ordinance

	Chicago	Columbus	Minneapolis/ St. Paul	Indianapolis	Des Moines	Dallas, Fort Worth	Atlanta	Average of All MSAs
Population Growth Rate (90-00)	11.6%	10.8%	16.9%	16.4%	16.1%	31.5%	38.9%	13.90%
Income Growth Rate (90-00)	6.5%	11.3%	13.1%	10.4%	13.1%	7.3%	7.6%	4.4%
Employment Growth Rate (90-00)	9.2%	17.1%	18.4%	16.7%	16.2%	25.1%	33.7%	11.0%
Housing Price Appreciation Rate (90-00)	16.6%	28.3%	24.7%	32.2%	33.2%	2.4%	18.4%	13.0%
Rent Growth Rate (90-00)	3.2%	5.6%	1.8%	6.0%	0.7%	11.4%	7.9%	1.5%
Dissimilarity Index	**1.65**	**11.76**	**5.34**	**13.32**	**6.86**	**48.23**	**26.67**	**0**

Source: 1990 and 2000 Census Data

Orland Park and Tinley Park are located adjacent to one another in Southwestern Cook

County, approximately 25 miles from the City of Chicago, and are in close proximity to Interstate 80. The two also have other similarities, representative of typical middle-income bedroom communities. Each has a population of about 50,000 and a median household income of about $60,000 according to the 2000 Census. The median house value in 1999 was $208,300 in Orland Park and $169,300 in Tinley Park. Both communities were incorporated over a century ago and have experienced relatively rapid growth since the 1970s. As a result, a majority of the properties in these communities are fairly new, and the median age of housing stock is about 20 years. Finally, Orland Park and Tinley Park are traditionally blue-collar suburbs, and many of the residents that moved to these communities from south Chicago carried with them the tradition of building with brick and masonry, which can partly explain why the two suburbs initiated the masonry ordinance far earlier than other suburbs in the area.

Enacted in 1992, the masonry ordinance in Orland Park states that

"Brick or other masonry materials shall be used for all sides of all nonresidential development and shall be installed per Village Building Code specifications.

All residential dwelling units shall contain face brick or stone on not less than fifty (50) percent of exterior walls and shall contain face brick or stone on ninety (90) percent of each first floor elevation or ground levels of such units."

---- Orland Park Village Land Development Code.

Enacted in 1988, the masonry ordinance in Tinley Park states that

"Exterior wall construction in all buildings with dwellings that are located one above

another shall be of solid masonry. Brick veneer construction shall not be permitted.

In all single family detached, single family attached and in all single family semi-detached dwellings, exterior walls shall be constructed of a face brick, decorative stone, or other approved masonry products.

Alternate materials to masonry exteriors may be considered on commercial buildings exceeding 7,500 square feet and built of non-combustible construction."

---Tinley Park Village Building Code.

In both ordinances, the requirement for the use of masonry is much stricter for nonresidential development than residential development. Solid masonry must be used for all sides of nonresidential development, while for residential development, particularly single-family housing development, only face brick is required on the first floor. Multifamily rental housing is often subject to the requirement for commercial development. There are two possible reasons for these different treatments. First, the higher emphasis on the construction quality and appearance of nonresidential buildings such as retail stores may be due to their implicit "public use" character and the need to attract customers. Second, since homeowners often have strong incentive to maintain properties well, communities may feel justified in lowering the standard for single-family development.

Pictures one and two show two sample development projects in Orland Park and Tinley Park after the masonry ordinance. Picture one is an assisted living project developed in Orland Park and Picture two is a multifamily housing project developed in Tinley Park.

Picture one: Assisted Living in Orland Park. Photo taken by John Burwell

Picture Two: Multifamily Housing Project in Tinley Park. Photo taken by Xiaoguang Wang.

Now that a decade has passed, the impacts of masonry ordinances can be observed, including the impacts on local property values and other community-wide changes brought by the ordinance. It can also be determined how significant these changes are relative to property values and community-wide changes that have occurred in other suburbs in the same metropolitan area.

4. Property Value Analysis

The impacts of a masonry ordinance on property values were evaluated at two levels. The first was at the individual property level. If the market preferred masonry, properties using masonry would be sold at a higher price than nonmasonry properties due to the high quality material. The second evaluation was at the community level and is derived from externality effects. Masonry ordinances, enacted at the municipal level, would result in community-wide clustering of masonry properties. If these properties do generate strong positive externality as a result of the quality of the material and enhanced architectural aesthetics, the entire community would become more attractive. These improved amenities would be capitalized into increased property values. Therefore, we should expect to see a higher level of property value in masonry ordinance communities than similar communities without such regulations.

To test the two levels of impacts, this study selected two comparable communities that do not have masonry ordinances, but are otherwise similar to Orland Park and Tinley Park. Using housing transaction data collected from these communities, a hedonic price model was built to isolate the property value impacts resulting from the ordinance by controlling for other variables such as property and neighborhood characteristics.

4.1 Selection of Comparable Nonmasonry Communities

The most difficult issue in the selection of comparable communities is determining how "comparable" they are. Given the idiosyncratic nature of communities, identifying a control group that is identical to the target group is impossible. Communities are

multi-dimensional, differing from each other, physically, socially, or economically. Thus, instead of searching for "identical" communities, this study identifies communities that are comparable in areas that are germane to the study, but allow differences in other less important aspects.

With this caveat in mind, three basic indicators were used to select suburbs that were comparable to Orland Park and Tinley Park when the masonry ordinances were developed. These indicators include population size, median household income, and median age of housing stock. The data were collected from the 1990 census and capture a suburb's most basic social and economic profile. Population size reflects the size of the suburb. Median household income measures its economic prosperity. Median age of housing stock not only indicates how old the suburb is, but also signals whether it has recently experienced new growth. The more new development a suburb has, the lower the median age of housing stock.

Based on the three indicators, another dissimilarity index was developed for each suburban jurisdiction in Cook County. Two dissimilarity indices were calculated for each suburb, one with Orland Park as the baseline and the other with Tinley Park as the baseline. The following formulas show how the dissimilarity index was calculated:

$$\text{Dissimilarity Index of Suburb i}_{\text{Orland Park}} = \left(\frac{P_i - P_{\text{Orland Park}}}{P_{\text{Orland Park}}}\right)^2 + \left(\frac{\text{MIncome}_i - \text{MIncome}_{\text{Orland Park}}}{\text{MIncome}_{\text{Orland Park}}}\right)^2 + \left(\frac{\text{MAge}_i - \text{MAge}_{\text{Orland Park}}}{\text{MAge}_{\text{Orland Park}}}\right)^2$$

$$\text{Dissimilarity Index of Suburb i}_{\text{Tinley Park}} = \left(\frac{P_i - P_{\text{Tinley Park}}}{P_{\text{Tinley Park}}}\right)^2 + \left(\frac{\text{MIncome}_i - \text{MIncome}_{\text{Tinley Park}}}{\text{MIncome}_{\text{Tinley Park}}}\right)^2 + \left(\frac{\text{MAge}_i - \text{MAge}_{\text{Tinley Park}}}{\text{MAge}_{\text{Tinley Park}}}\right)^2$$

P_i: population size in suburb i.

$P_{\text{Orland park}}$: population size in Orland Park.

$P_{\text{Tinley Park}}$: population size in Tinley Park.

MIncome_i: Median Household Income in Suburb i.

$\text{MIncome}_{\text{Orland Park}}$: Median Household Income in Orland Park

$\text{MIncome}_{\text{Tinley Park}}$: Median Household Income in Tinley Park

MAge_i: Median Housing Age in Suburb i.

$\text{MAge}_{\text{Orland Park}}$: Median Housing Age in Orland Park

$\text{MAge}_{\text{Tinley Park}}$: Median Housing Age in Tinley Park

For each index, all suburbs in Cook County were ranked. The lower the index, the more similar the suburb is relative to the baseline case. Interestingly, the index illustrates that Orland Park and Tinley Park are very similar to each other. Four other suburbs, the Villages of Streamwood, Wheeling, Hoffman Estates, and Elk Grove, were consistently ranked within the top five most similar, both to Orland Park and to Tinley Park. Streamwood, for example, is the second most similar to Orland Park and the most similar to Tinley Park (Table 2).

Despite their similarity to Orland Park and Tinley Park, all four comparable suburbs are located either north or northwest of Chicago. Surprisingly, none are located in the south, where Orland Park and Tinley Park are located. A review of development patterns in the area, however, can explain why no southern suburbs were found to be comparable to Orland Park and Tinley Park. In Metro Chicago, most of the residential development

and new employment centers have concentrated in the north and northwest suburbs. In contrast, as the region's manufacturing base, south of Chicago is largely composed of old industrial suburbs and has been hit hard by recent industrial decline. Many of the southern suburbs are struggling with job and population loss and have not experienced much growth in recent years (Orfield, 2002; Hendrick, 2004; Siewers, 1997). The exceptions, however, are Orland Park and Tinley Park, where new development has dominated the landscape in the last couple of decades.

Table 2: The Top Five Most Similar Communities to Orland Park and Tinley Park

	Ranking by Similarity to Orland Park	Ranking by Similarity to Tinley Park	1990 Population	1990 Median Family Income	1990 Median Housing Age
Village of Orland Park	0	4	35,720	56,516	11
Village of Tinley Park	1	0	37,150	49,105	14
Village of Streamwood	2	1	30,987	50,301	15
Village of Wheeling	3	2	29,911	44,966	15
Village of Hoffman Estates	4	5	46,561	53,292	16
Village of Elk Grove	5	3	33,429	53,795	17

Source: 1990 and 2000 Census Data

After further examination of the list in Table 2, comparable communities were narrowed to two, Hoffman Estates and Streamwood. Elk Grove was excluded because, based on Orfield's influential study, it has now grown into an affluent job center, while the other suburbs are all classified as bedroom communities (Orfield, 2002). Similarly, Wheeling was excluded for its reputation as a strong industrial center and its relatively low

homeownership rate when compared with the others[3]. As a result, the Villages of Hoffman Estates and Streamwood were chosen as the most comparable to Orland Park and Tinley Park, though it is likely that they may still differ in some ways that challenge their validity as comparable communities. The selection reflects a best effort to identify comparable communities and is the result of the three selected indicators.

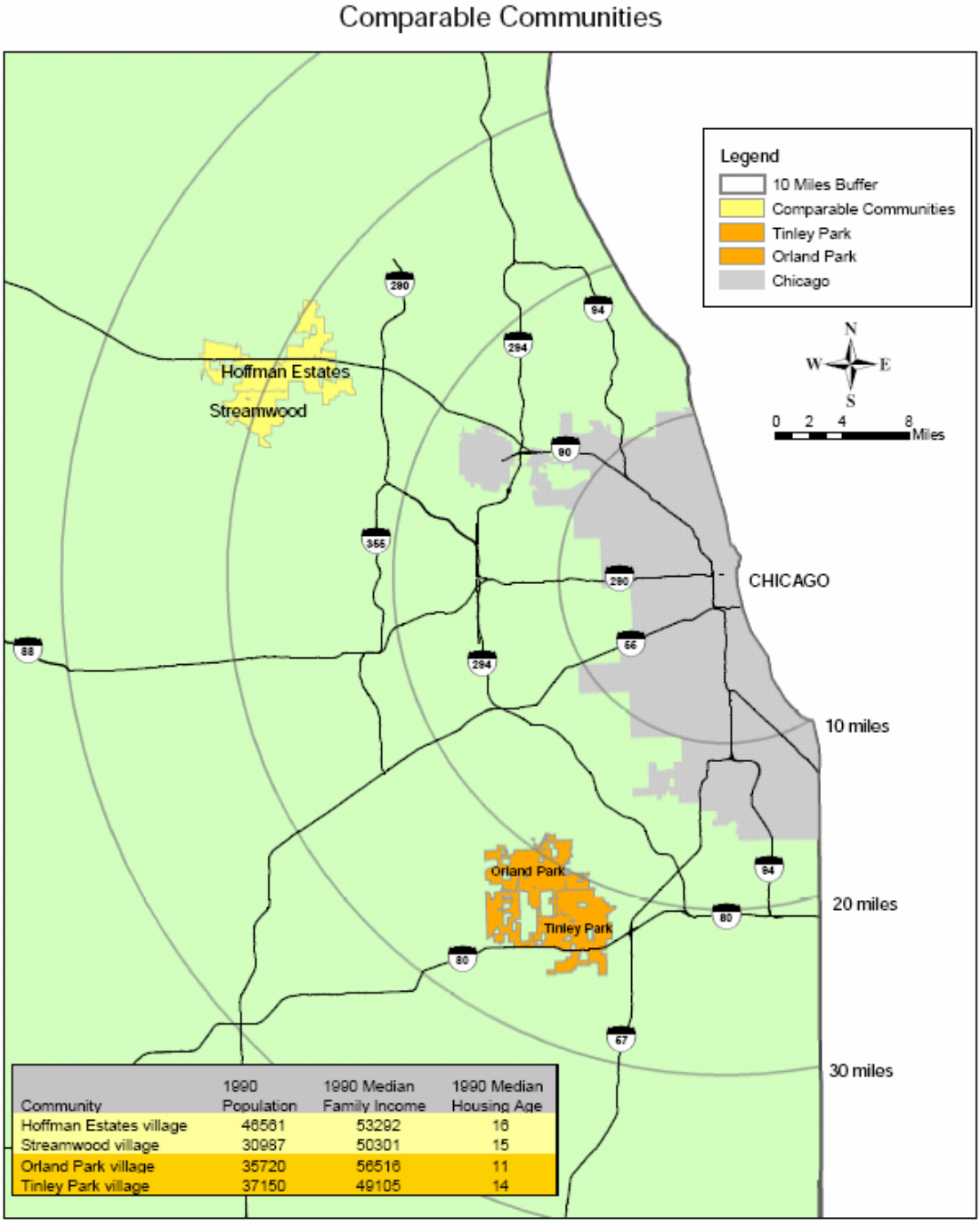
One might argue that given different indicators, the selection of comparable communities may be different. The three indicators chosen - population size, median household income, and median age of housing stock - describe the most basic characteristics of a community. Thus, for communities to be comparable, they must first be comparable on these three aspects.

Finally, this study used 1990 Census data to build a dissimilarity index. This allows us to measure similarity among the suburbs when the masonry ordinances were enacted, and examine whether the communities developed differently after enacting the masonry ordinances. If the ordinance has made any difference, the comparable suburbs should no longer be similar to Orland Park and Tinley Park by today's standard.

Map 1 shows the location of the final four case-study communities: the two masonry ordinance suburbs, Orland Park and Tinley Park, and the two comparable nonmasonry ordinance suburbs, Hoffman Estates and Streamwood. Note that all are located 20 to 30 miles from the City of Chicago.

[3] The homeownership rate in the Village of Wheeling is only 64% based on the 1990 Census, while the homeownership rate in Orland Park, Tinley Park, Hoffman Estates, and Streamwood ranges from 74% to 85%..

Map One



Community	1990 Population	1990 Median Family Income	1990 Median Housing Age
Hoffman Estates village	46561	53292	16
Streamwood village	30987	50301	15
Orland Park village	35720	56516	11
Tinley Park village	37150	49105	14

Another interesting question about the four suburbs is whether their location differences, with the masonry ordinance communities in the south and the nonmasonry ordinance communities in the northwest, might introduce some bias in their development trend. If there is any bias, it is more likely to be against the masonry ordinance suburbs since the southern Chicago MSA is known as an area with greater economic difficulties than north and northwest Chicago (Orfield, 2002; Hendrick, 2004; Siewers, 1997).

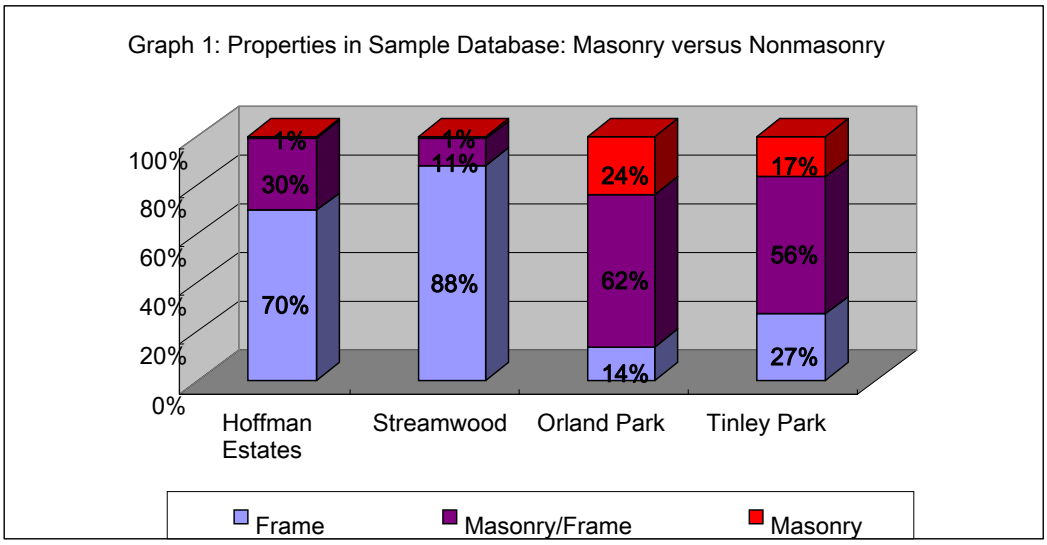
4.2 Research Data

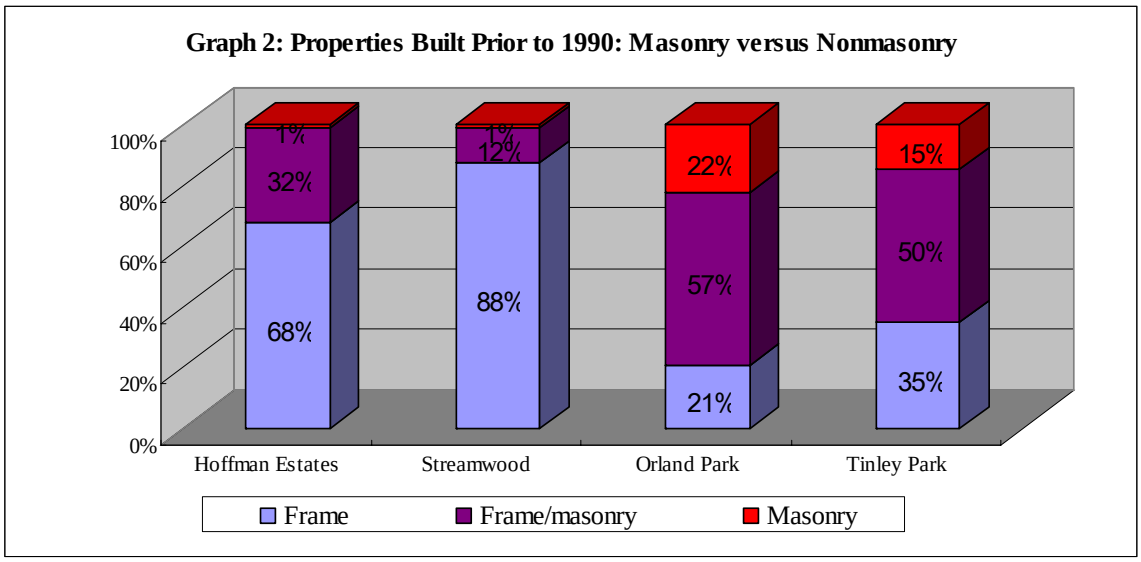
After the comparison groups were defined, a hedonic price model was constructed. Over 20,000 single-family housing transaction records were obtained from First American Real Estate Solutions for the four suburbs from 1978 to 2005[4]. This dataset was selected because it provides information about a property's exterior wall material. Four types of exterior walls were identified in the dataset: Masonry, Masonry/Frame, Frame, and Stucco. Masonry refers to the properties with at least three entire exterior walls built of masonry materials, such as brick and stone. Frame refers to the properties with at least three entire exterior walls built of wood or siding. Masonry/Frame refers to the properties with less than three entire walls built of masonry or frame. Stucco refers to the properties with at least three entire outside walls built of stucco. Only a dozen of the properties in the dataset were built with stucco, and they were excluded from analysis.

Graph 1 shows the composition of properties in the database by three types of exterior wall materials: masonry, masonry/frame, and frame. As expected, a majority of the

[4]The original dataset includes all the single-family housing transactions during this period. After excluding the records with missing values, we were left with 20,089 valid records. First American Real Estate Solutions compiled the data from local assessors' offices and records of deeds' offices.

properties in Orland Park and Tinley Park were built with masonry, while properties in Hoffman Estates and Streamwood were predominantly frame. A further look into the construction dates of these properties shows that this distinction existed even before the masonry ordinance was enacted (Graph 2). Clearly there was a strong preference for masonry in Orland Park and Tinley Park even before the ordinance, while such preference was not observed in Hoffman Estates and Streamwood. Thus, instead of bluntly changing the communities' development characteristics, masonry ordinances have been enacted to continue the traditional use of masonry in Orland Park and Tinley Park.





4.3 Hedonic Price Model

4.3.1 Model Structure

The hedonic price model applies the difference-in-difference approach developed by George Galster. Known for its rigorousness, this approach identifies target groups and control groups. The target group in this case includes the two masonry ordinance suburbs, Orland Park and Tinley Park; and the control group includes the two nonmasonry ordinance suburbs, Hoffman Estates and Streamwood. It then measures *the changes in property value difference* between the target and control groups after some policy intervention (in this study, the enacting of a masonry ordinance in the target group). Furthermore, this approach is also noted for its ability to distinguish between property value level and appreciation trend. The difference-in-difference approach has the advantage of controlling for both historical development trends and external social and economic forces. Thus it can inform us about the direction of causality: that is, whether the observed differences in property value are the result of the policy intervention, or the

result of other historical or external factors (Galster et al., 1999; Galster, 2004).

The following equation describes the structure of the hedonic price model using single-family housing transaction data. The logic is that property value should reflect the property's structural characteristics, neighborhood quality differences, city-wide amenity differences, and time of sale. Two types of characteristics are expected to be altered by a masonry ordinance. One is the structural characteristics, since the ordinance imposes a specific requirement for exterior wall materials. The other is the city-wide amenity differences due to the different concentration of masonry properties between masonry ordinance and nonmasonry ordinance suburbs. A semi-log functional form was used to control for the heteroschedacity problem in the regression process. The dependent variable in the model is then the natural logarithm of housing price (please see the following equation).

$$
\begin{aligned}
&\log(P) \\
&= C + (a_1 x_1 + a_2 x_2 + ... + a_6 x_6) && (1)\\
&+ (a_7 Wall_{masonry} + a_8 Wall_{masonry\&\ frame}) && (2)\\
&+ (b_1 City_{orland} + b_2 City_{tinley} + b_3 City_{hoffman}) && (3)\\
&+ (b_4 PostCity_{orland} + b_5 PostCity_{tinley} + b_6 PostCity_{Hoffman} + b_7 PostCity_{Streamwood}) && (4)\\
&+ (c_1 Trend_{orland} + c_2 Trend_{tinley} + c_3 Trend_{Hoffman} + c_4 Trend_{streamwood}) && (5)\\
&+ (c_5 Posttrend_{orland} + c_6 Posttrend_{tinley} + c_7 Posttrend_{Hoffman} + c_8 Posttrend_{streamwood}) && (6)\\
&+ (d_1 Quarter_{first} + d_2 Quarter_{second} + d_3 Quarter_{third}) && (7)\\
&+ (f_1 BG_1 + f_2 BG_2 + ... + f_{110} BG_{110}) && (8)
\end{aligned}
$$

The first set of independent variables, x_1 to x_6, describes a property's structural characteristics. They include square feet of living area, number of bathrooms, lot size, age

of the property at sale, attached parking or not, and whether the unit has central air conditioning.

Of key concern, the variables of the second set, $Wall_{masonry}$ and $Wall_{masonry\&frame}$, are dummy variables to describe a property's exterior wall materials. If the exterior wall is entirely masonry, $Wall_{masonry}$ receives a value of 1; otherwise 0. If the exterior wall uses both masonry and frame, $Wall_{masonry\&frame}$ receive a value of 1; otherwise 0. The baseline is where the exterior wall uses only frame.

The variables of the third set, $City_{orland}$, $City_{tinley}$, and $City_{hoffman}$, are dummy variables indicating in which suburb the property is located. The omitted baseline is Streamwood. The coefficients for the three dummy variables measure the difference in the level of property value between Orland Park, Tinley Park, Hoffman Estates, and the baseline of Streamwood, everything else being equal. They are the results of the differences in city-wide amenities.

The variables of the fourth set, $PostCity_{orland}$, $PostCity_{tinley}$, $PostCity_{hoffman,}$ $PostCity_{streamwood}$, are built on the third set of variables with an added criterion regarding whether the sale occurred after the ordinance. $PostCity_{orland}$ (or $PostCity_{tinley}$, $PostCity_{hoffman}$, $PostCity_{streamwood}$) equals 1 if the property is located in Orland Park (or Tinley Park, Hoffman Estates, Streamwood) and sold after 1990; otherwise 0. The coefficients for these variables thus measure the *changes* in property value level in the post-ordinance period.

The variables of the fifth set, $Trend_{orland}$, $Trend_{tinley}$, $Trend_{hoffman}$, and $Trend_{streamwood}$, measure the price appreciation trend in these suburbs. If a property is located in Orland Park (or Tinley Park, Hoffman Estates, Streamwood), $Trend_{orland}$ (or $Trend_{tinley}$, $Trend_{hoffman}$, $Trend_{streamwood}$) equals the difference (in years) between the transaction year and 1977 (the year before our study period); otherwise 0. For example, $Trend_{orland}$ receives a value of 1 if the property is in Orland Park and is sold in the first year of the study period (1978), a value of 2 if the property is in Orland Park and sold in the second year of the study period (1979), and so on. The coefficients for these variables thus measure the annual price appreciation rate in each suburb.

The variables of the sixth set, $PostTrend_{orland}$, $PostTrend_{tinley}$, $PostTrend_{hoffman}$, and $PostTrend_{streamwood}$, are built on the fifth set of variables with the extra criterion regarding whether the properties are sold after the ordinance. $PostTrend_{orland}$ (or $PostTrend_{tinley}$, $PostTrend_{hoffman}$, $PostTrend_{streamwood}$) equals $Trend_{orland}$ (or $Trend_{tinley}$, $Trend_{hoffman}$, $Trend_{streamwood)}$ when the property is located in Orland Park (or Tinley Park, Hoffman Estates, Streamwood) and is sold after 1990; otherwise it equals 0. The coefficients for these variables measure the *change* in price appreciation trend in the post ordinance period in each suburb.

The variables of the seventh set, $Quarter_{first}$, $Quarter_{second}$, and $Quarter_{third}$, measure the seasonal effects in housing transactions. $Quarter_{first}$ (or $Quarter_{second}$, $Quarter_{third}$) equals 1 if the sales occur in the first quarter (or second quarter, third quarter); otherwise 0.

The independent variables of the last set, from BG1 to BG130, are all dummy variables indicating in which block group the property is located. A block group is a census-defined geographic area. It generally contains between 600 and 3,000 people, with an optimum size of 1,500 people. BG1 equals 1 if the property is located in block group one; otherwise 0. BG2 equals 1 if the property is located in the block group two; otherwise 0, and so on. Block group is used as a proxy for neighborhood; thus these dummy variables are created to control for any differences in neighborhood quality that may exist among the properties. There are 110 block group variables.

4.3.2 Model Results

Table 3 presents the results of the hedonic price model. All independent variables collectively explain 74% of the price variations across the 20,089 transaction records. This is impressive given the limited information known about the individual properties. However, since the dependent variable is the natural logarithm of housing price, the coefficient for each independent variable cannot be easily interpreted. The following calculation process explains how to interpret the coefficient in a semi-log functional form.

Equation 1

$$Ln(\mathrm{Price}) = C + \sum_{j=1}^{n} \alpha_j X_j \qquad (1)$$

Assuming there is one unit increase in variable X_i and all the other independent variables remain unchanged, the result is:

Equation 2

$$Ln(New\,\mathrm{Price}) = C + \sum_{j=1,\, j\neq i}^{n} \alpha_j X_j + \alpha_i (X_i + 1) \qquad (2)$$

Equation (2) minus equation (1), we have the following results:

$$Ln(New\,\mathrm{Price}) - Ln(\mathrm{Price}) = \alpha_i$$
$$\rightarrow \frac{New\,\mathrm{Price}}{\mathrm{Price}} = Exp(\alpha_i)$$
$$\rightarrow \frac{New\,\mathrm{Price}}{\mathrm{Price}} - 1 = Exp(\alpha_i) - 1$$
$$\rightarrow \%\ \text{change in price} = Exp(\alpha_i) - 1$$

Mathematically, with one unit increase in variable X_i, the percentage change in price equals the exponential value of that variable's coefficient minus one. To make it easily readable, the final column was added to Table 3 to show the percentage change in price as a result of one unit increase in each independent variable. As Table 3 shows, all the structure variables are significant and have expected signs. For example, one additional acre in lot size will increase housing price by 15%, everything else being equal. One additional bathroom will increase housing price by about 4.2%, everything else being equal. Attached parking will increase housing price by about 1.26% more than detached parking.

Table 3 shows that the use of different exterior materials does have an independent impact on housing price, after controlling for all other property features. The coefficients for $Wall_{masonry}$ and $Wall_{masonry\&frame}$ are both significant and positive. The more masonry is used, the higher the price. Compared with properties whose exterior is entirely frame, properties with at least three sides of masonry walls sell at a 2.5% higher price, and properties with both masonry and frame on their exteriors sell at a 1.6% higher

price, everything else being equal. Thus, for a typical $200,000 house, these coefficients would be translated into a difference of about $5,000 and $3,300 respectively. Such differences can be viewed as the premium paid for the benefits owners of masonry properties enjoy – benefits such as aesthetic appeal, reduced maintenance cost, and insurance cost savings.

In contrast to the moderate premium a masonry property holds over a nonmasonry property, there is a much larger price difference between the masonry ordinance suburbs and nonmasonry ordinance suburbs. All coefficients for $City_{orland}$, $City_{tinley}$, and $City_{hoffman}$ are significant and positive, indicating a higher price level in Orland Park, Tinley Park, and Hoffman Estates than in the baseline of Streamwood. Specifically, after controlling for all structure characteristics, neighborhood quality, and time of sale, a constant-quality property would be sold 87% higher in Orland Park, 99% higher in Tinley Park, and 12.5% higher in Hoffman Estates, than in Streamwood. Note that these are the price differentials *before* the ordinance. Since 1990 and the adoption of masonry ordinances in the masonry ordinance suburbs, prices have risen in all four suburbs, but at a different magnitude, as captured by the coefficients for $PostCity_{orland}$, $PostCity_{tinley}$, $PostCity_{hoffman,}$ and $PostCity_{streamwood}$. In Orland Park and Tinley Park, price increases by 16% and 27% respectively, while in Hoffman Estates and Streamwood, the increases are about 14% and 10%. As a result, since 1990, the same property would sell 96% higher in Orland Park, 130% higher in Tinley Park, and 16% higher in Hoffman Estates than if it were located in Streamwood.

Besides the price differences, the model also reveals a difference in price appreciation trend among the suburbs. The coefficients for the trend variables, $Trend_{orland}$, $Trend_{tinley}$, $Trend_{hoffman}$, and $Trend_{streamwood}$ are all positive and significant, indicating a consistently rising housing price in these suburbs. Before the ordinance, the annual appreciation rate was lower in Orland Park and Tinley Park (about 5.5%) than in Hoffman Estates and Streamwood (about 7.0% and 6.3% respectively). After the ordinance, housing appreciation slows down in all four suburbs, as indicated by the negative coefficients for the four post-trend variables ($PostTrend_{orland}$, $PostTrend_{tinley}$, $PostTrend_{hoffman}$, $PostTrend_{streamwood)}$[5]. The appreciation rate declines the most in Hoffman Estates (a drop of 1.3%), followed by Streamwood (a drop of 0.8%), then by Tinley Park (a drop of 0.7%) and Orland Park (a drop of 0.6%). Thus, the annual price appreciation rate in the 1990s averages about 5% in Orland Park, 4.8% in Tinley Park, and 5.7% in both Hoffman Estates and Streamwood. Table 4 compares the housing price level and appreciation rate in the pre- and post-ordinance period for the four suburbs based on the hedonic price model results. Note that the difference between masonry ordinance communities and nonmasonry ordinance communities is always much larger than the difference within each group.

[5] We also examined the OFHEO (Office of Federal Housing Enterprise Oversight) Housing Price Index for Chicago metropolitan area during the same study period and find a similar slow-down for the entire metropolitan area. We regard this as the result of the shift in metropolitan economy.

Table 3: Hedonic Price Model Results

(Dependent Variable: Ln (Price))
(No. of Observations: 20,089; Adjusted R Square = 74%)

Variables	Coefficients	Standardized Coefficients	Sig.	% change in price from one unit increase in each independent variable
Constant	9.9655		0.00	
Square feet of Living Area	0.0002	0.28	0.00	0.02%
Lot Size (in Acres)	0.1433	0.06	0.00	15.41%
Age of Property at Sale	-0.0049	-0.14	0.00	-0.49%
Total No. of Bathroom	0.0412	0.06	0.00	4.21%
Attached Parking	0.0125	0.01	0.05	1.26%
Central Air conditioner	0.0128	0.01	0.01	1.27%
$Wall_{masonry}$	0.0249	0.01	0.00	2.52%
$Wall_{masonry\&frame}$	0.0159	0.01	0.01	1.60%
$City_{orland}$	0.6262	0.53	0.00	87.06%
$City_{tinley}$	0.6884	0.51	0.00	99.05%
$City_{hoffman}$	0.1183	0.10	0.01	12.56%
$PostCity_{orland}$	0.1446	0.11	0.00	15.56%
$PostCity_{tinley}$	0.2424	0.16	0.00	27.43%
$PostCity_{hoffman}$	0.1295	0.10	0.00	13.83%
$PostCity_{streamwood}$	0.0971	0.07	0.01	10.20%
$Trend_{orland}$	0.0541	0.92	0.00	5.56%
$Trend_{tinley}$	0.0537	0.81	0.00	5.52%
$Trend_{hoffman}$	0.0681	1.18	0.00	7.04%
$Trend_{streamwood}$	0.0626	1.09	0.00	6.46%
$PostTrend_{orland}$	-0.0054	-0.09	0.03	-0.54%
$PostTrend_{tinley}$	-0.0069	-0.10	0.04	-0.69%
$PostTrend_{hoffman}$	-0.0127	-0.22	0.00	-1.26%
$PostTrend_{streamwood}$	-0.0074	-0.13	0.02	-0.74%
$Quarter_{first}$	-0.0585	-0.04	0.00	-5.68%
$Quarter_{second}$	-0.0275	-0.02	0.00	-2.71%
$Quarter_{third}$	-0.0099	-0.01	0.07	-0.98%
110 Block Group Variables	…….			

Note: in the last column, the % change in price from one unit increase in each independent variable is calculated using the following formula: % Price Change = Exp(Coefficient)-1.
Source: author's calculation

Table 4 shows two conflicting patterns. The price level comparison shows that property values are higher in Orland Park and Tinley Park, but the appreciation rate analysis shows that housing price appreciates faster in Hoffman Estates and Streamwood during the study period. To determine which pattern dominates and to observe their combined impacts, a simple simulation was performed by applying the model results to four hypothetical properties, with one in each case-study suburb. All of the properties were assumed to have the same characteristics: 2,000 square feet of living area, 0.25 acre lots, 2 bathrooms, 20 years old, having attached parking and central air conditioning, having exterior walls that were masonry/frame, and sold in the first quarter. The values for these characteristics were assigned based on their median value among the sample properties. Further assumptions were made that the four properties did not differ in their surrounding neighborhood quality, so that the effects from the different suburbs could be isolated.

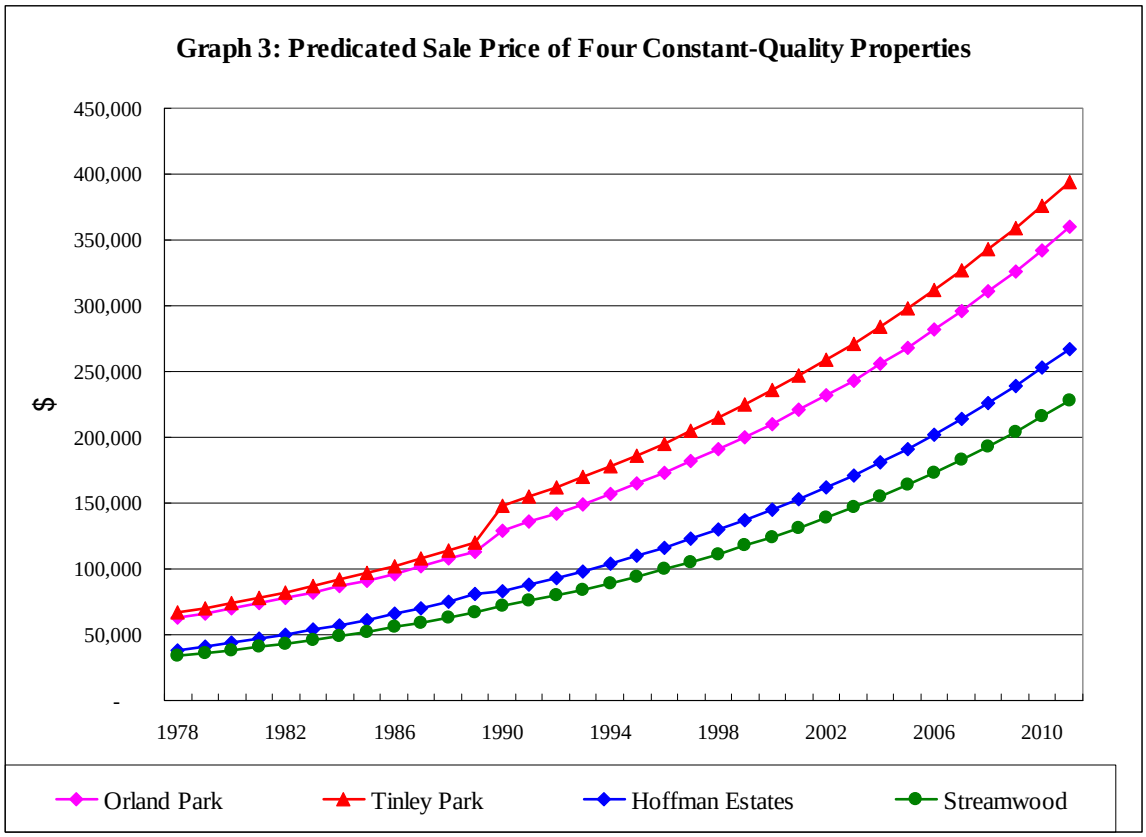
Table 4: The Price Level and Appreciation Trend in Pre- and Post-Ordinance Period

Group	Suburbs	Price Level		Annual Appreciation Rate	
		Pre-ordinance	Post-Ordinance	Pre-ordinance	Post-Ordinance
Masonry	Orland Park	187.1%	196.2%	5.6%	5.0%
	Tinley Park	199.0%	230.2%	5.5%	4.8%
Nonmasonry	Hoffman Estates	112.6%	116.3%	7.0%	5.7%
	Streamwood	100.0% (Baseline)	100.0% (Baseline)	6.5%	5.7%

Source: Tabulated by the author based on the hedonic price model results.

Graph 3 depicts the predicted sale price for the four constant-quality properties at different points in time for the four suburbs. The difference in price level dominates the difference in appreciation rate. Property values in Orland Park and Tinley Park, despite

their relatively low appreciation rate, have been significantly higher than those in Hoffman Estates and Streamwood for a significant period of time[6]. For example, in 2005, a constant-quality property would be sold at $297,731 in Tinley Park and $268,352 in Orland Park, while only $191,442 in Hoffman Estates and $163,680 in Streamwood.



Note that such price differentials apply to constant-quality properties only. They are the premium paid for living in a specific suburb and reflect the city-wide amenity differences, nothing else. Thus they may not be in line with other empirical data collected for these suburbs, such as the median housing price, since these data often reflect the composition of different-quality properties. Still, the magnitude of these city-wide differences is a surprise. One plausible explanation is that although best efforts were made in the

[6] In fact, if the same trend continues, not until 2050 will the property value in Hoffman Estates catch up with that of Orland Park, and not until 2080 will the property value in Streamwood catch up with that of Orland Park.

selection of comparable communities, the selected communities could still differ from the target group in some ways that contribute to the property value differences. Thus, this quasi-experimental approach has an inherent limitation, since it is impossible to control for all factors. Fortunately, the difference-in-difference approach helped address such concerns by identifying both the pre- and the post- trend circumstances.

With this caveat in mind, the model does provide positive evidence of a masonry ordinance's impact on property values. As shown in Graph 3, there is an upward shift of the property value curves in the two masonry ordinance suburbs after the ordinance was enacted, a phenomenon not seen in nonmasonry ordinance suburbs. Second, in spite of a metropolitan-wide slowdown in the 1990s, the appreciation rate experienced less of a decline in the two masonry ordinance suburbs than in the two nonmasonry ordinance suburbs. These two changes together have increased the property value gap between the masonry ordinance communities and the nonmasonry ordinance communities in the post-ordinance period.

Thus, the two levels of property value impact proposed before, the individual property level and the community level, are confirmed by the model. In Orland Park and Tinley Park, a masonry property would not only be sold at a higher price than a frame property due to the quality of the exterior building material, it would also capture a significant price premium from its proximity to other masonry properties in the community. These externality effects, to some degree, existed before the ordinance, since Orland Park and Tinley Park already had a higher concentration of masonry properties at that time. The

enacting of a masonry ordinance, however, only strengthens the externality effects by assuring the construction of additional masonry structures. Interestingly, the pattern revealed in the model, that the price premium associated with the masonry ordinance communities existed before the ordinance and further increased after the ordinance, matches quite well with the development history.

5 Community Competitiveness Analysis

The hedonic price model examines only property value differences among the four selected suburbs in order to quantify the independent impacts from masonry materials and masonry ordinances. Despite the model's rigorousness, it is not enough to capture the full impacts of a masonry ordinance. Local communities, when considering whether to enact a certain development regulation, are not only concerned with their impacts on local property values, but also their impacts on local competitiveness. Communities often ask themselves, for example, whether the regulation would be too restrictive and discourage new development. This is a particular concern for suburbs, since suburbs in the same metropolitan area compete severely with each other for economic development. Thus, it is equally important to examine how Orland Park and Tinley Park perform relative to other suburbs in the same metropolitan area in terms of economic health and growth. Specifically, the study evaluated Orland Park and Tinley Park not only in comparison to Hoffman Estates and Streamwood, but also in the context of all 120 suburbs in Cook County, where the City of Chicago is located. The focus is on Cook County only instead of the entire Chicago metropolitan area in order to avoid some inter-county regulatory variations. Finally, expanding the comparison group from the four case-study suburbs to all Cook County suburbs can also help verify the results from previous property value analysis.

5.1 Economic Health Measured by Revenue Generating Capacity

The evaluation of a community's economic health is focused on the fiscal side, because a

community's revenue wealth is an indicator of its economic prosperity[7]. Instead of comparing the actual revenue amount, which may be distorted by different levying practices, this study evaluates the size of the tax base. To do this, the two largest local revenue sources, property tax and sales tax, were examined. The State of Illinois equalized assessment value (EAV, thereafter) was used to correct for the fact that some jurisdictions may under-assess or over-assess their properties. The total sales receipts collected by local businesses were used to indicate the sales tax base. Both datasets were obtained from the Illinois Department of Revenue.

5.1.1 Property Tax Base

In order to be comparable, the property tax base is standardized by a jurisdiction's population size. Graph 4 shows the total EAV per capita in current dollars for each suburb in four different years, 1985, 1990, 1995, and 2000[8]. The total EAV is the EAV of all taxable properties in the community, including residential, commercial, industrial, farm, etc. As shown in this graph, Orland Park consistently has the highest assessment value, about $25,000 per capita in 2000, followed by Hoffman Estates. The assessment value in Tinley Park and Streamwood started very low, at about $5,000 per capita in 1985. However, Tinley Park grew much faster than Streamwood. By 2000, Tinley Park's assessment value doubled, almost reaching the level of Hoffman Estates; Streamwood, however, remained as the lowest in EAV per capita.

[7]The author acknowledges that this is a simplified view of a local economy. But fiscal health has indeed become a central concern to many local governments.

[8] Because the official population data are only available for decennial Census, such as 1980, 1990 and 2000, we have to estimate the population for 1985 and 1995 in order to calculate the EAV per capita. The 1985 population is calculated as the average of the 1980 and 1990 population, while the 1995 population is calculated as the average of the 1990 and 2000 population.

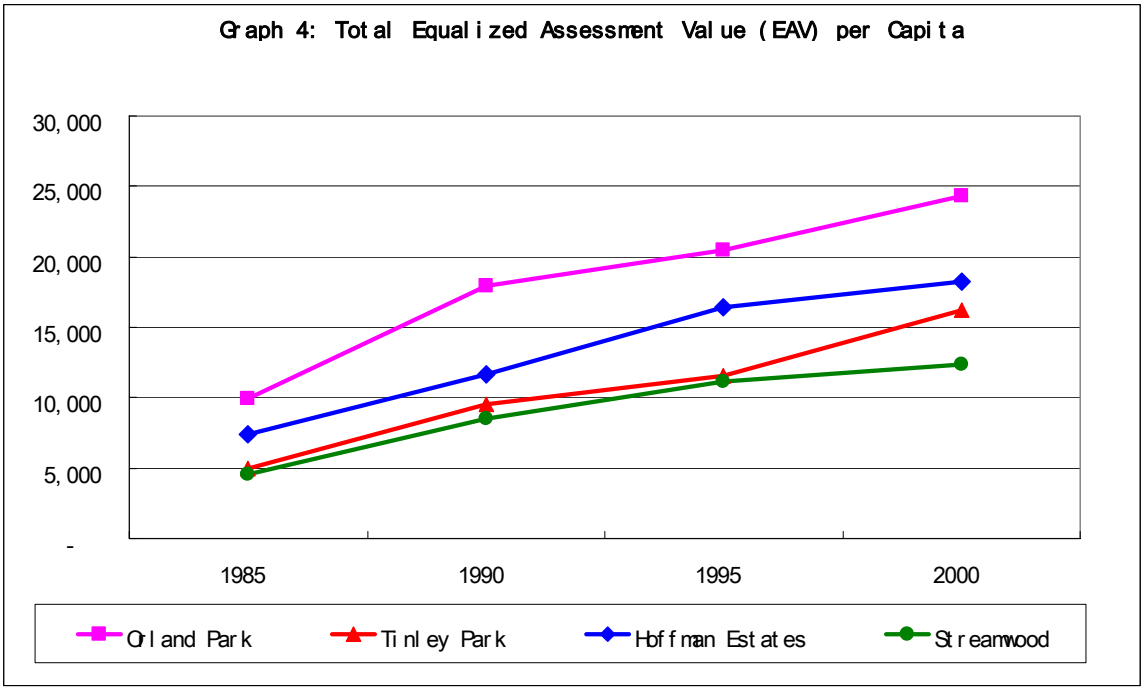


Table 5 shows the ranking of the four case-study suburbs among all 120 Cook County suburbs by total EAV per capita. The order is ranked from highest to lowest, with one indicating the highest ranking. Table 5 shows a similar pattern to the above graph. Tinley Park jumped from 91st in 1985 to 64th in 2000, which is among the largest rises in Cook County in EAV per capita during this period. By 2000, Orland Park and Tinley Park both had a property tax base higher than almost half of the suburbs in Cook County.

Table 5: Ranking of Total EAV per Capita among All 120 Suburbs in Cook County

(1=highest, 120=lowest)

	1985	1990	1995	2000
Hoffman Estates	62	64	52	56
Streamwood	98	83	79	82
Orland Park	44	32	39	32
Tinley Park	91	79	76	64

Source: Illinois Department of Revenue

Since all four case-study suburbs are bedroom communities and contain predominantly residential properties, this study also evaluates the tax base on residential properties. Table 6 shows the ranking of the four suburbs in Cook County by residential EAV per capita. The trend is similar to what was observed for total EAV. The ranking in both Orland Park and Tinley Park improved from 1985 to 2000, but the change was most dramatic for Tinley Park, which moved from 80th to 36th place. By 2000, the residential tax base per capita in Orland Park and Tinley Park was not only larger than those of the two nonmasonry ordinance suburbs, but also larger than the tax base per capita of over two thirds of the suburbs in Cook County. This confirms the findings in the hedonic price model.

Table 6: Ranking of Residential EAV per Capita among all 120 Suburbs in Cook County

(1=highest, 120=lowest)

	1985	1990	1995	**2000**
Hoffman Estates	**42**	44	42	**49**
Streamwood	**69**	61	56	**60**
Orland Park	**32**	25	25	**27**
Tinley Park	**80**	52	50	**36**

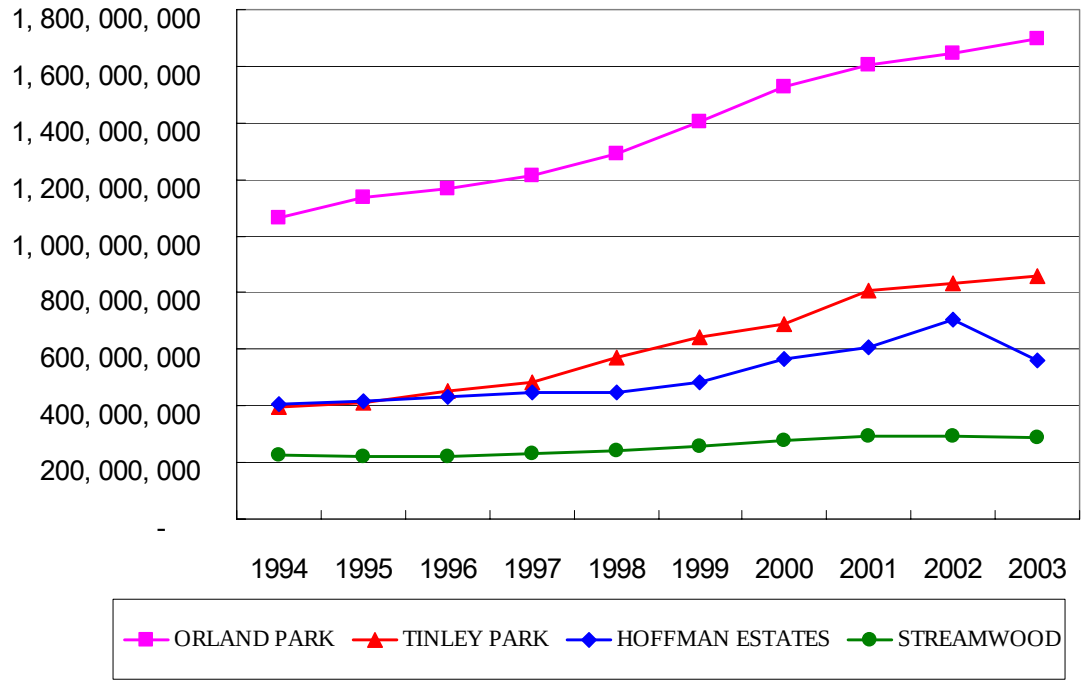
Source: Illinois Department of Revenue

5.1.2 Sales Tax

Sales tax is the other major mechanism local governments use to enhance economic health. For many local governments, sales tax not only offers a significant amount of revenue, but also helps diversify local revenue structure and ensures revenue stability. Compared to the relatively stable property tax, sales tax is more closely tied to local business activities and is more responsive to economic growth. This study evaluates the wealth of the sales tax revenue base by examining the amount of sales receipts collected

in each suburb. The data covers a period from 1994 to 2003, a period after the 1990 Sales Tax Reform that streamlined sales tax collection in Illinois[9]. Prior to that time, the Illinois Department of Revenue could not provide sales receipt data that could be compared across jurisdictions. This timeframe is a disadvantage since the study is unable to observe the situation before the masonry ordinance. Still, the data are sufficient to inform us about the cross-jurisdictional variation in retail activities in the post-ordinance period.

Graph 5: Total Sales Receipts Collected in Case-Study Suburbs



Graph 5 depicts the annual total sales receipts in current dollars for the four case-study suburbs. Data is not presented on a per capita basis because annual population data are not readily available. This was not a serious issue, however, since the four suburbs are

[9] Currently the typical sales tax rate in Illinois is 6.25%. All sales tax revenue is collected by the state government. Of the 6.25%, 5% is retained by the state, 1% is allocated to local governments, and 0.25% goes to the county based on the point of collection.

similar in population size. Orland Park again exceeds the other three suburbs by a very large margin, reaching about $1.7 billion in sales receipts collected in 2003. Tinley Park follows, though at a smaller magnitude. Just as was observed for property tax base, sales receipts in Tinley Park also started low, but accelerated rapidly in the 1990s. By 2003, sales receipts in Tinley Park exceeded $800 million. Sales receipts in Streamwood, by contrast, remained stagnant from 1994 to 2003.

The comparison of sales tax base was extended to all suburbs in Cook County, on a per-capita basis since these suburbs vary widely in size. Data for 1994 and 2003 are presented. For each suburb, the 1990 Census population data were used to standardize the sales receipts in 1994, and the 2000 Census population data were used to standardize the sales receipts in 2003. As shown in table 7, Orland Park and Tinley Park outperform two thirds of the suburbs in Cook County both in terms of the sales revenue per capita and total sales receipt growth rate. In particular, by doubling its total sales receipts within the ten-year period, Tinley Park has placed itself as the tenth-fastest-growing suburb in Cook County in terms of local sales revenue generation.

Table 7: Ranking of Sales Receipts per Capita among All 120 Suburbs in Cook County

(1=highest, 120=lowest)

	Sales Receipts per Capita 1994	Rank	Sales Receipts per Capita 2003	Rank	Total Sales Receipt Growth Rate (1994-2003)	Rank
Hoffman Estates	8,756	55	11,305	54	37%	40
Streamwood	7,384	68	7,841	69	25%	63
Orland Park	29,773	13	33,252	13	60%	23
Tinley Park	10,719	47	17,715	33	115%	10

Source: Illinois Department of Revenue

5.1.3 Tax Burden

Tax base analysis provides information regarding only a community's revenue-generating capacity. It does not indicate the community's expenditure needs. Growing communities such as Orland Park and Tinley Park often have strong expenditure needs, such as expanding infrastructure facilities or increasing municipal services to a growing population. A sizeable tax base may not be that much of an advantage once expenditure needs are taken into consideration. Therefore, the analysis is expanded further by examining the tax burden that local residents bear. Tax burden measures the balance between revenue and expenditures. If a community's revenue raising capacity is high relative to its expenditure needs, the local residents' tax burdens would be low. Local property tax burden was examined because it constitutes the largest tax payment to local governments. Using data from the 1992 and 2002 Census of Government, tax burden was measured as the ratio of property tax payment to income per capita, that is, the percentage of personal income spent on property tax payments. Due to data constraints, only property tax paid to municipal governments was evaluated, not including taxes charged by school districts or county governments. The comparison reflects only the difference in municipal tax burden between jurisdictions, which is a result of municipal resources and expenditure.

Table 8 shows the municipal tax burden of the four case-study suburbs, in both 1992 and 2002, as well as their positions in Cook County. As shown in the table, the tax burden in Orland Park and Tinley Park is quite low, with residents spending only about 0.5% and 0.83%, respectively, of their income on municipal property tax in 2002, while the median

tax burden is about 1.12% in Cook County. This was expected given the size of the tax base in the two communities. Streamwood shows an equally low tax burden. Despite its smaller tax base, the municipal government of Streamwood seems to balance expenditures well with revenue so that its residents are not overburdened.

Table 8: Ranking of Municipal Property Tax Burden

among all 120 Suburbs in Cook County (1=lowest, 120=highest)

	Ratio of Municipal Property Tax to Income per Capita 1992	Rank	Ratio of Municipal Property Tax to Income per Capita 2002	Rank
Hoffman Estates	0.98%	68	2.22%	103
Streamwood	0.78%	53	0.58%	22
Orland Park	0.65%	38	0.50%	16
Tinley Park	0.65%	36	0.83%	35
Median Suburban Tax Burden in Cook County	0.82%		1.12%	

Note: The ranking is from low to high. One indicates the tax burden is the lowest and 120 indicates the tax burden is the highest.
Source: 1992 Census of Government and 2002 Census of Government.

The fiscal analysis of the case-study communities has presented a fairly consistent picture. The revenue-generating capacity in Orland Park and Tinley Park is not only stronger than in Hoffman Estates and Streamwood, but also exceeds that of many other suburbs in Cook County. The municipal property tax burden in Orland Park and Tinley Park is also quite low. This is notable given that they are both located in the part of Metro Chicago that was known to be hard hit by industrial relocation. Unlike many of their neighboring communities that have struggled with job loss and fiscal distress, economic growth in Orland Park and Tinley Park has flourished, with a thriving economy and

expanding tax base.

5.2 Growth Impact

Previous analysis shows that property values in Orland Park and Tinley Park increased after the masonry ordinances were enacted and they remain at a higher level than property values of many other suburbs in the area. To explain what drives up the property value, two different thoughts are offered in existing studies of development regulations. The first is on the supply side. If a development regulation is too restrictive and discourages new development, property value increases as a result of the reduced supply. The second thought is on the demand side. If the development regulation has increased local amenities and made the communities more attractive, price would rise as a result of the increased demand (Brueckner, 1998). It is important to know which one applies to the case of a masonry ordinance.

This study examines the growth patterns after the masonry ordinances were enacted to determine the degree to which supply and demand contributed to the increased property values. Table 9 shows the population and housing growth rate for the four case-study suburbs from 1990 to 2000 based on U.S. Census Data. Both Orland Park and Tinley Park have experienced massive development since implementing the masonry ordinances. Housing units increased by 53% in Orland Park and 36% in Tinley Park, while at the same time the median growth rate in housing units among Cook County's suburbs during the same period was only 5%. Once again, the two masonry ordinance suburbs not only grew faster than the comparable nonmasonry ordinance suburbs, but also faster than half

of the suburbs in Cook County. Given these figures, it is hard to believe that the masonry ordinance has significantly inhibited new growth. The increase in local property values thus seems to be more of a result of increased demand, rather than reduced supply. This is also reasonable given the nature of the ordinance. Masonry ordinances are often used as design guidelines. Although construction costs are increased when masonry exterior is required, the cost increase is often small, less than 5 or 6%, depending on the specific region of the country[10]. Cost increases should not discourage development as long as there is a strong market demand for such properties. As revealed in the hedonic price model, there is indeed a high premium placed on the two masonry ordinance suburbs, indicating the strong market demand for these communities.

Table 9: Population and Housing Growth from 1990 to 2000

	2000 Housing Units	2000 Population	Population Growth Rate	Housing Units Growth Rate 90-00
Hoffman Estates	17,387	49,495	6.0%	5.0%
Streamwood	12,371	36,407	17.0%	20.0%
Orland Park	19,045	51,077	43.0%	53.0%
Tinley Park	18,037	48,401	30.0%	36.0%
Median Value among All Suburbs in Cook County	5303	13,196	5.2%	4.6%

Source: 1990 and 2000 Census

5.3 Housing Affordability

As property values increase in Orland Park and Tinley Park, one may become concerned about housing affordability. This section addresses this issue. Housing affordability was measured as the percentage of household income spent on housing-related costs. A high

[10]Another way to gauge the cost impact of a masonry ordinance is to look at previous studies of building codes. A recent literature review shows that building codes in general do not increase housing cost to a significant degree, only about 5%, much less than land use regulations that directly limit local land supply (Listokin and Hattis, 2005).

share of income spent on housing indicates a low affordability level. For renters, the housing related cost is simply the gross rental payment. Homeowners and renters were examined separately.

Table 10 shows the median monthly owner cost as a percentage of household income using 2000 Census data. The Census defines monthly owner costs as the sum of payments for mortgages, real estate taxes, property insurance, utilities and fuels. Homeowners are further distinguished into two groups: those having an existing mortgage and those who have already paid off their mortgage. For the first group, the monthly owner cost includes mortgage payment; for the second group, it excludes mortgage payment.

Table 10: Housing Cost Burden in 2000, Measured by Percentage of Household Income Spent on Housing-related Cost

		Median Cost Burden among all Suburbs in Cook County	Hoffman Estates	Streamwood	Orland Park	Tinley Park
Homeowners	With Mortgage	22.8%	22.3	23.2	22.20%	22.20%
	Without Mortgage	11.80%	9.9	11.8	11.70%	11.20%
Rental Households		24.4%	24.7%	24.4%	23.40%	24.10%

Source: 2000 Census.

As shown in Table 10, whether having a mortgage payment or not, homeowners' cost burden in Orland Park and Tinley Park is slightly lower than the median cost burden level among Cook County's suburbs. For example, the median cost burden for owners with a mortgage in Cook County is about 22.8% of household income, while in Orland Park and

Tinley Park it is about 22.2%. When all 120 suburbs were ranked by owner cost burden, Orland Park was ranked as the 34th lowest in owner cost burden and Tinley Park was ranked as the 33rd lowest in owner cost burden. A similar pattern can be observed for owners without a mortgage payment.

Table 10 also shows the median monthly rent as a percentage of household income based on 2000 Census data. Again, renters in Orland Park and Tinley Park have slightly lower rental burden (23.4% in Orland Park and 24.1% in Tinley Park), than the median rental burden among Cook County's suburbs, which is about 24.4%. When all suburbs in Cook County were ranked according to rental burden, Orland Park was the 38th lowest and Tinley Park was the 53rd lowest. Thus, judged by 2000 Census data, the two masonry ordinance suburbs are more affordable to their residents than half of the other suburbs in Cook County.

6. Conclusion

Masonry ordinances are usually used by local communities as an architectural standard or a design guideline to regulate development quality and are now gaining popularity in some fast-growing suburbs in the country. Unlike traditional design guidelines that are often discretionary, masonry ordinances define specific standards for the type and percentage of materials to be used as the exterior building material. The emerging phenomenon of masonry ordinances represents some suburbs' efforts to secure a sustainable future for their communities and to mitigate the threats of future sprawl. By examining more than a decade's practice of masonry ordinances in two Chicago suburbs, this study has found that these ordinances are associated with a significantly positive increase in local property values and an expanding local tax base. In fact, the two masonry ordinance suburbs have outperformed many of their neighbors in the same metropolitan area on the various indicators examined.

The strong economic performance observed in Orland Park and Tinley Park may not be entirely attributed to the adoption of a masonry ordinance. We cannot deny the possibility that these positive outcomes may well reflect the confluence of many factors, with a masonry ordinance being one of them. This study, however, has made a careful selection of comparable communities to evaluate the property value impacts and has expanded the evaluation of community economic health to all suburbs in Cook County. The evidence revealed in this study is clear and consistent and is sufficient to argue that masonry ordinances have indeed contributed to the fiscal well-being of Orland Park and

Tinley Park. The two masonry ordinance communities are attractive to local residents and businesses alike, as evidenced by their high property values and thriving retail industries. Findings also revealed that the masonry ordinance has not discouraged growth in the communities that enacted it. Rather, it has helped attract quality growth. Nor has the masonry ordinance caused a serious housing affordability problem.

The primary benefit of a masonry ordinance does not come solely from the use of masonry on individual properties. There is only a moderate premium associated with a masonry property over a nonmasonry property. What seems more significant is the improvement in local amenities due to the externality effects from the clustering of high-quality masonry properties. Masonry ordinances then are not simply a requirement for specific exterior wall materials. More importantly, they function as a signal to developers that the community emphasizes construction quality that is sustainable for the future of a community, both physically and economically. In an era in which construction quality has often been ignored, masonry ordinances have made their communities distinctive.

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