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The Effect of Sheriff's Sales on Condominium Sub-Market Property Values

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Abstract. A challenge in analyzing the spillover impact of sheriff's sales on neighboring properties is the recognition that housing markets are segmented. In this fashion, the large heterogeneous market of housing is broken down into small, more homogeneous segments, and buyers emerge that match their wants and needs with the product offered by the marketplace. It is clear that comparing the impact of sheriff's sales of single-family homes to condominium prices ignores the idea of segmented markets. As a result, it is valuable to break down these markets by sector. By using a unique dataset on property sales, sheriff's sales, and foreclosures for the City of Milwaukee from October 2005 to September 2009, we confirm that a single-family condominium foreclosure has a negative and significant impact on the sale of surrounding condominium units. The estimated impact decays with distance from the sheriff's sale property and the length of time separating the two transactions, the most significant impact being a loss of 24% - 28% when the two units are sold within thirty days of one another and within the same building.

1. Introduction

Attention in the foreclosure crisis has focused primarily on the direct victims: homeowners and lenders. In general, foreclosure remediation has focused on preventing the loss of the family home. This policy track attempts to assist the direct victim. However, the community also receives a benefit in the form of preservation of property value. The extent to which foreclosure and property value are related is a necessary consideration to allocate funds intended to prevent families from losing their home. However, public policy can also reflect the initial damage caused by this crisis and the spillover cost to the general community.

When establishing the relationship between foreclosure and property value, two fundamental issues are central in defining this relationship. The first issue concerns the level of knowledge of a foreclosure that the consumer[1] has. Secondly, if a negative externality does exist between foreclosure and property value, is the externality homogeneous across housing submarkets. The extent to which these issues are answered will define the direction of the relationship between foreclosure and property value.

The first issue, market clearing, is possible when there is perfect information. At notification of foreclosure, the market has imperfect information likely limited to adjacent neighbors. Once a property is in foreclosure the outcome is either remediation with the lender, sale of property, or sheriff's sale. Since a short sale is not necessary and sufficient for a foreclosure, market clearing is only possible from a sheriff's sale when the market has perfect information.

[1] A consumer is one who has the potential to purchase a housing unit; thus, even though all households are not simultaneously searching for a housing unit all households are simultaneously consumers of a housing unit.

The existence of a unique condominium submarket (Allen et al., 1995) implies the differentiation of valuation methods. Therefore, the relationship between sheriff's sale and property value is a unique function for every housing submarket, regardless of the result.

This research is intended to alleviate a deficiency in the examination of the condominium submarket and establish a spatial relationship between a condominium sheriff's sale and the property value of surrounding condominiums. The remainder of the study will proceed as follows. Section 2 provides a summary of the current literature regarding the spatial relationship between foreclosures or sheriff's sales and housing prices. Section 3 offers background on the data used in this study and the collection procedures used to acquire it. Section 4 outlines the model used to identify the spatial relationship between housing prices and sheriff's sales. Section 5 presents the results of the study, and Section 6 reviews the conclusions with a brief discussion of the results.

2. Literature Review

The proposition that condominiums are a differentiated submarket evolves from the economic concept of substitution (Fisher and Fisher, 1954; Grigsby, 1963; Rapkin et al., 1953). The concept of the housing submarket is based on the principle that any property should be an equal substitute for another, not limited to properties within the same neighborhood (Grigsby, 1963; Rothenberg et al., 1991; Jones, Leishman, and Watkins, 2003). However, research indicates the existence of many submarkets due to the failure of the argument of equal substitution, location being the primary submarket differentiation (Bourassa et al., 2003).

The use of condominiums as a submarket follows from research conducted by Allen et al. (1995). Building on this idea of a condominium submarket is the integration of geographical submarkets to the condominium submarket (Goodman and Thibodeau, 2008). Thus a unique secondary condominium submarket exists around every condominium. Although the secondary submarket is unique for each condominium, their collection is a singular data set differentiated by the center of the disc encompassing the unique geographical area.

The extent to which foreclosures and sheriff's sales of condominiums have an effect on the sales price of adjacent property is critical to others in the neighborhood and local governments. The reduced valuation becomes a negative externality that leads to a reduction in property values and tax revenues. Various models that value condominiums and single-family residences further support a sheriff's sale examination that focuses exclusively on condominiums. Policymakers and their agents recognize this challenge in attempting to anticipate the challenge created by the foreclosure crisis.

A challenge presented in foreclosure research is the lack of spatial analysis. The early research into mortgage defaults (Jung, 1962; Page, 1964) focuses on the relationship between the loan to value ratio and the interest rate. In these early years, this research concentrates on the lender or the borrower, not the community. In fundamental work that creates the foundation for future research, Von Furstenberg (1969, 1970a, 1970b, 1974) approaches the mortgage default as an examination of risk, quality, and delinquency; much of this literature is based on individual microeconomic level data. However, the issue of location did arise in one article (Von Furtstenberg, 1974). This article's model includes a dummy variable to differentiate between properties located in Allegheny County and those outside the county. However, this spatial issue ties together the region and the foreclosure outcome. Much of the early foreclosure literature is covered in Quercia and Stegman (1992) and Vandell (1995).

As the United States experienced a rise in homeownership (Myers et. al, 2005; Borjas, 2002), it also witnessed an expansion in the literature on mortgage foreclosures. Baxter and Lauria (2000) investigate the relationship between neighborhoods that went through economic and racial transitions and foreclosure rates. However, there has been little spatial analysis on the extent of the negative spillover created by foreclosures and sheriff's sales on the sales price of nearby properties. Carroll et al. (1995) examine the extent to which HUD-foreclosed properties' sales prices differ from non foreclosed properties. They find that, while properties foreclosed on by banks sell for the same price as nearby non-foreclosed homes (controlling for a number of hedonic variables), the HUD foreclosures sell for significantly less than their non-foreclosed neighbors. With its sample of over 2100 single family homes in Las Vegas Nevada, the work serves as an early analysis with a larger sample.

However, as the unique magnitude of the current housing and mortgage crisis evolves, this limited literature has grown. As a result, a wealth of relevant literature has appeared in the past few years. These studies use standard OLS regression

models that examine the relationship between time and distance of foreclosed properties on subsequent sales prices for nearby properties. One of the initial recent studies (Immergluck and Smith, 2006) finds that, for each additional foreclosure within one-eighth of mile, property values decline by one percent. This amounts to a decrease in value of $1,870 per property within the eighth-of-a-mile ring. The aggregate impact of this loss in valuation is considerable in a dense community where dozens of homes are impacted by the foreclosure. This baseline paper anticipates the problem. However, it looks at the impact of foreclosures in 1997 to 1998 on home price sales in 1999.

Center for Public Policy (2001) details a hedonic model that estimates the house-price impact of vacant and abandoned properties (a not so rare outcome of urban foreclosures) on sales prices of nearby houses in Philadelphia. They find that proximity to a vacant and abandoned house lowers the sales price of a nearby house by more than $7,000. Similarly, Immergluck and Smith (2005) studied the Chicago housing market and found that foreclosures city-wide reduce surrounding property values from roughly $600 million to $1.39 billion.

Leonard and Murdoch's (2009) hedonic models determine that the impact of foreclosures is a one-percent decrease in sales price when the foreclosure is within 250 feet of the impacted property. While this impact diminished with distance from the foreclosure, it continues to be significant even at 1500 feet away.

Lin et al. (2009) draws on appraisal data, rather than home sales data, to examine the impact foreclosures have on neighboring properties. Assuming that foreclosed properties sell at a discount, and that the discounted sales prices are used as comparables, foreclosures will lead to reduced appraised values of nearby houses. Their regression results suggest that foreclosures have a significant negative effect up to 10 blocks away from the foreclosure and up to 5 years after the foreclosure. The effect is most severe on adjacent properties within two years of foreclosures. During this time frame, the impact diminishes out to 0.6 miles. It also diminishes over time to about 50% of the initial impact after 6 years. There is no significant impact if the foreclosure is 6 or more years old and beyond one-quarter mile. Lin et al. (2009) also contends that the intensity of the spillover effects is closely tied to housing cycles and could be reduced by about half during housing market boom years.

Leonard and Murdoch (2009) investigate foreclosures in the greater Dallas area. They uncover the negative effect of distress on prices, which diminishes as distance from the foreclosed property grows. Their estimates indicate that nearby foreclosures produce externalities that are capitalized into home prices—an additional foreclosure within 250 feet of a sale negatively impacts selling price by approximately $1,666.

Finally, Rogers and Winter (2009) examine foreclosures in St. Louis County, Missouri, finding the expected negative impact. They also find that the marginal impact of additional foreclosures actually falls as foreclosures increase, which contradicts the proposition that rising foreclosures may have a rising marginal effect on prices. In contrast, Rogers (2010) finds larger marginal impacts for new foreclosures in the year 2000 compared to the marginal impact of new foreclosures in 2007. Despite these studies, the idea of a significant negative impact on real estate prices produced by nearby foreclosures is not universally held. A recent paper by Calomiris, Longhofer, and Miles (2008) quantifies a relatively small effect foreclosures have on house prices.

Keifer and Keifer (2009) use quarterly data for 48 states to examine the impact a one percent change in foreclosures has on the single family home prices within the State. They estimate that on the state level, using a simultaneous equation system of spatial autoregressions (SESSAR) to model the co-movement of foreclosures and house price changes, a one percent negative national foreclosure shock leads to a 16.73 percent increase in the U.S. house price.

3. Data

This paper hypothesizes that a sheriff's sale acts as a negative externality on the surrounding condominiums for a period no longer than a year. The sheriff's sale acts as a supply side externality lowering the submarket equilibrium property value. Other factors influencing the negative externality including deterioration of the sheriff's sale property, vacancy and vandalism, and appraised values. The projected diminishing returns of the externality are due to barriers to market clearing. Legal delays, search delays, and financing delays all contribute to the duration of a market's ability to fully price the sheriff's sale. Thus, the primary null hypothesis is that there is no effect of a condominium sheriff's sale on the value of surrounding condominiums. The study area is the City of Milwaukee, Wisconsin,

from 2005 through 2009. The study area was chosen based on the availability of data.

3.1 Sheriff's sale data

The sheriff's sale data includes all property sheriff's sales in the city of Milwaukee from 2000 to 2009. The city of Milwaukee delineated all property sheriff's sales by land use codes, indicating what type of structure it was. The sheriff's sale data was culled to remove all sheriff's sales outside of the 2005 to 2009 time period and all properties without a condominium indicated land use. The final dataset consisted of 215 condominium sheriff's sales. The 215 condominiums match the parcel identification number included with the sheriff's sale data, ensuring parcel-specific information; each condominium was then spatially geocoded.

Table 1. Hedonic summary statistics.

Panel A	Mean	Median	Std. Dev	Skewness	Minimum	1%	99%	Maximum	Obs.
Year Built	1967.92	1974	35.60	-0.97	1854	1883	2008	2008	3766
Total Sq. Ft.	1230.48	1111	537.03	3.29	325	450	3220	9173	3799
Bedrooms	1.93	2	0.70	0.46	1	1	4	5	3799
Full Baths	1.46	1	0.55	0.82	1	1	3	5	3799
Half Baths	0.36	0	0.50	0.80	0	0	2	2	3799
Sale Year	2006.63	2007	1.27	0.30	2005	2005	2009	2009	3799
Sale Price	221011	170500	319058	20.21	1000	20000	1352735	13262600	3799
Panel B									
Year Built	1967.85	1974	35.63	-0.98	1854	1875	2008	2008	3652
Total Sq. Ft.	1206.03	1113	423.38	1.37	450	536	2650	3220	3683
Bedrooms	1.92	2	0.69	0.42	1	1	4	5	3683
Full Baths	1.45	1	0.54	0.58	1	1	3	4	3683
Half Baths	0.35	0	0.49	0.83	0	0	2	2	3683
Sale Year	2006.64	2007	1.27	0.30	2005	2005	2009	2009	3683
Sale Price	201462	171500	154242	2.27	20000	27000	810000	1351000	3683

3.2 Property sales data

The property sales publically-available dataset is located on the City Assessor's website for the City of Milwaukee.[2] The City of Milwaukee Assessor's Office provided easily sortable data files containing the property sales information for each year in the dataset. The dataset was limited to all single-family residential condominium transactions during the period from January 2005 through December 2009.

The Milwaukee dataset consisted of 47,042 residential property sales, of which 3,799 were condominium sales. All single-family residences were defined to have at least one bedroom and one full bathroom and greater than 0 square feet. Any property not meeting these criteria was considered invalid and not included in the above dataset. The dataset was further screened to remove all outliers, yielding a final dataset of 3,683 property sales.[3] Table 1 lists the summary statistics for the dataset; Panel A includes the outliers and Panel B removes the outliers.

3.3 Spatial geocoding

In order to conduct this analysis, all addresses in the property sales dataset and the addresses of each sheriff's sale were spatially geocoded. The spatial dataset used parcel information where available and block data as a supplement to spatially render the position.[4] The spatial position, latitude and longitude, is then representative of a location on a sphere where a vector calculation is used to calculate the distance between any two points.

[2] Milwaukee, WI City Assessor's Website: http://city.milwaukee.gov/assessor.

[3] Property sales corresponding to the 1st and 99th percentiles were removed from the Milwaukee dataset before creation of the final dataset.

[4] The parcel information would be available for all properties older than 5 years. Less than 5% of the properties sold were built in the last five years.

An issue of interpretation arises when analyzing the spatial positions. In the best-case scenario, an address is matched to a parcel and a parcel-centroid is returned as the position of the property. The first interpretation issue is that the centroid is a fixed position. Depending upon the shape of the property and the surrounding properties, there is an exclusion bias based on actual nearest property line to nearest property line measurement.

The more important interpretation issue is the property owner's perception of distance. The distance calculations in this study are equidistant in all directions from the centroid, regardless of the orientation of the condominium. A homeowner's interpretation of 1500 feet from their property may change into a distorted cardioid instead of having an elliptical form; the depiction in Figure 1 gives an example. The ability to control for relative orientation of the property to the orientation of the street would be an important area of research for the future. Since no such methodology currently exists, this paper will use the strict definition of distance.

Figure 1

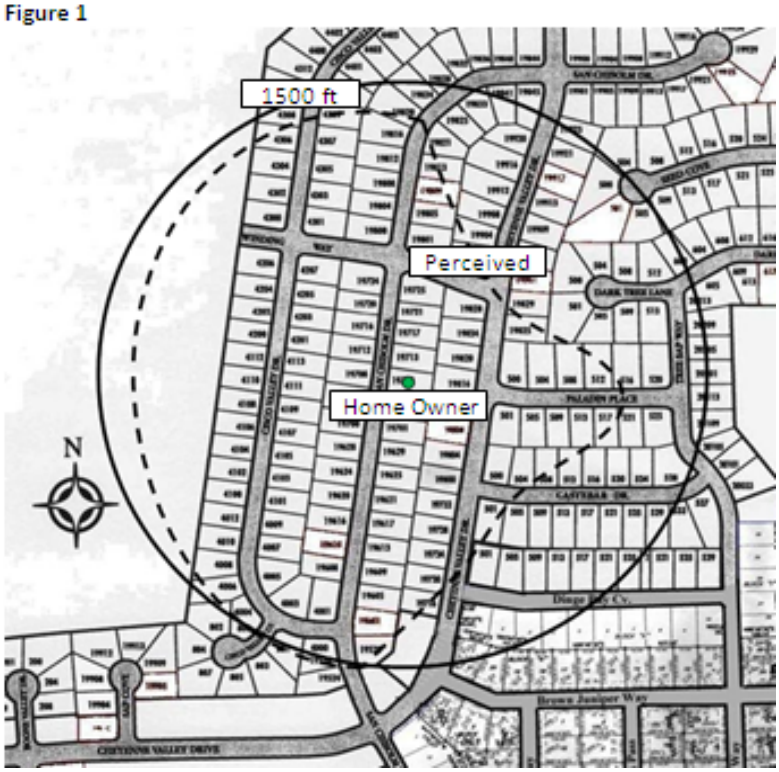

Figure 1. Property owner's perception of distance.

The methodology to calculate the distance between properties is an automated process where an Excel VBA application was designed to calculate the arc length on the sphere between two points. When calculating the distance, the mean radius of the earth is used to determine the arc length. It is unnecessary to use a more specific measure due to the homogeneity of the terrain in the City of Milwaukee and relative equality of the polar distance range. All addresses returned accurate spatial information; the final dataset of 3,683 property sales includes census tract data for all of the addresses.

4. Empirical specification

This study employs a typical log-linear regression specification to identify the implicit price elasticity of a condominium being near a sheriff's sale. The results will be a reflection of an ability to remove spatial heterogeneity between household residency decisions near and not near a sheriff's sale. The inclusion of different control variable sets will identify the unique implicit price difference between a property sale with and a property sale without the characteristic of interest.

Condominiums are unique compared to single-family homes in part due to their relative compactedness. To test whether or not a sheriff's sale has an impact on the sale of another condominium, several time and distance specification requirements will be used. The time specification runs from 0 to 12 months after a sheriff's sale. The distance specification identifies properties within five exclusive rings, with inclusive to exclusive boundaries of: 0 to 50, 50 to 625, 625 to 1250, 1250 to 2640, and 2640 to 5680 feet.

It is of interest to see how general condominium sales vary across the city of Milwaukee. There are 15 aldermanic districts in the City of Milwaukee, all but two of which have condominiums. A simplified cross-sectional approach to estimate the value of a condominium would take a form similar to the following:

$$lnPrice = \hat{\beta} + \hat{\delta}\, Aldermanic_i + \hat{\varepsilon} \qquad (0)$$

where *lnPrice* is the log of the property sale price taken over a single time-period and *Aldermanic* is the set indicating in which aldermanic district the condominium is located. In addition, $\hat{\beta}$ is the intercept, $\hat{\varepsilon}$ is an error term and $\hat{\delta}$ represents a vector of parameters to be estimated. To remove confounding with the chosen time-period, a pooled cross-sectional approach would take the form of the following:

$$lnPrice = \hat{\beta} + \hat{t}\, Year_c + \hat{\delta}\, Aldermanic_i + \hat{\varepsilon} \qquad (1)$$

The addition of *Year* as a set of dummy variables indicates the year in which the transaction took place. To account for the heterogeneity between residences, a set of hedonic variables (described in Table 1) is included and the estimation of condominium value takes the form:

$$lnPrice = \hat{\beta} + \hat{\alpha}\, Structural_a + \hat{t}\, Year_c + \hat{\delta}\, Aldermanic_i + \hat{\varepsilon} \qquad (2)$$

However, specification [2] includes all properties, condominium sheriff's sales and non-sheriff's sales. To eliminate neighborhood heterogeneity between the different residence demand functions for sheriff's sale and non-sheriff's sale properties, specification [2] is changed to incorporate a dummy variable indicating whether or not the individual sale was a sheriff's sale or not taking the form:

$$lnPrice = \hat{\beta} + \hat{\alpha}\, Structural_a + \hat{t}\, Year_c + \hat{\delta}\, Aldermanic_i + \hat{\rho}\, SherrifsSale + \hat{\varepsilon} \qquad (3)$$

Here *SheriffsSale* is the dummy variable indicating whether or not the property is a sheriff's sale. Though specification [3] controls for temporal, spatial, and structural heterogeneity, there is still a possibility that there exist elements near a sheriff's sale that are not homogeneous throughout an aldermanic district.[5] This intraspatial-intertemporal variation will be assumed random, having no correlation with sheriff's sale properties. The results of specification [3] will indicate the typical value of a sheriff's sale property, compared to non-sheriff's sale properties.

The mere existence of a sheriff's sale does not indicate the residual impact the sheriff's sale has on the surrounding condominiums. To identify the residual impact a sheriff's sale has on the surrounding properties, the dataset is limited to only non-sheriff's sale properties. Specification [2] is changed to incorporate a vector of spatial variables, indicating the presence of a sheriff's sale during the prescribed time and within the distance ring, taking the form:

$$lnPrice = \hat{\beta} + \hat{\alpha}\, Structural_a + \hat{t}\, Year_c + \hat{\gamma}\, Spatial_b + \hat{\delta}\, Aldermanic_i + \hat{\rho}\, SherrifsSale + \hat{\varepsilon} \qquad (4)$$

Specification [4] is the same as specification [3] with *Spatial* being the vector of dummy variables indicating the presence of a sheriff's sale. Additionally, $\hat{\gamma}$ is the vector of parameters to be estimated. The spatial indicators are used both as the number of sheriff's sales and the existence of at least one sheriff's sale, as well as varying time and distance interactions. Specification [4] is the primary form of the model used to identify the residual impact of a sheriff's sale on surrounding properties. The results from these specifications are listed in Tables 1 - 5.

5. Results

Examining the results from specifications [1]-[4], attention will focus on the variables of interest, not

[5] Examples of this intraspatial-intertemporal variation would be neighborhood eye-sores like ill-maintained homes or offensive neighbors.

reporting coefficients for control variables within the specification. Specifications [1]-[4] were run for the sample of 3,683 properties under a robust standard errors least squares regression to correct for correlation between the error terms. Heteroskedasticity exists within the model due to unobserved factors such as hallway width, color of the building, and other such factors that the consumer might value.

Specification [1], shown in Table 2, indicates the premium paid to live within an aldermanic district between the years 2005-2009. The specification was run on three different sample sets: the complete set of condominium sales, non-sheriff's sales, and sheriff's sales. The results from the complete set of condominium sales indicate a condominium price range of 185% from the most undervalued district to the most valued. This inter-district change in value holds relatively constant when examining non-sheriff's sale condominium sales and sheriff's sale condominium sales. Note that when examining sheriff's sale condominiums only, aldermanic districts 8, 10, 11, and 14 are omitted due to multicollinearity; the omitted variable is aldermanic district 5, and aldermanic districts 1 and 7 have no condominium sales.

Table 2. Results of Specification 1.

	All Condominium Sales		Non-Sheriff's sales		Sheriff's sales	
Variable	coeff.	t-stat	coeff.	t-stat	coeff.	t-stat
ALD-2	-0.529***	-8.41	-0.439***	-7.78	-0.002	-0.01
ALD-3	0.698***	36.28	0.678***	40.75	0.962***	5.97
ALD-4	0.850***	44.3	0.831***	48.81	1.145***	6.98
ALD-6	0.759***	32.53	0.753***	37.94	0.565*	1.68
ALD-8	-0.003	-0.01	-0.080	-0.05	(omitted)	
ALD-9	-0.254***	-7.25	-0.191***	-6.52	-0.059	-0.23
ALD-10	0.765***	17.82	0.740***	18.08	(omitted)	
ALD-11	0.401***	12.83	0.374***	12.7	(omitted)	
ALD-12	0.708***	22.63	0.687***	22.67	1.099***	5.02
ALD-13	0.295***	11.71	0.277***	12.71	0.622***	3.36
ALD-14	0.570***	17.42	0.549***	17.46	(omitted)	
ALD-15	-0.044	-0.32	0.054	0.62	0.358	0.83
const.	11.270	417.41	11.290	477.65	10.733	42.09
Obs.	3855		3683		172	
F-stat	404.23		412.35		25.93	
Prob > F	0		0		0	
R-squared	0.6334		0.626		0.5735	
Root MSE	0.46637		0.44077		0.59317	

***, **, and * indicate two-tailed significance at the 1%, 5%, and 10% levels, respectively.

A second econometric issue, endogeneity, is likely persistent throughout the data due to confounding from consumer search preferences. It is likely that consumers have predefined taste preferences for the location of their home and as a result will not consider all available choices on the market. This may either positively or negatively impact the final price of the home. This is an uncorrectable aspect of the dataset.

Specification [2], results in Table 3, indicates the value of certain hedonic characteristics (Table 1) of a given condominium holding year and aldermanic district constant. The results from non-sheriff's sale condominium sales indicate a general preference for

more bathrooms and newly built condominiums. Results from the other two datasets estimated indicate consistent results with the non-sheriff's sale condominium sales results.

The addition of a sheriff's-sale dummy variable to control for the demand differences, specification [3], generated the results listed in the final column of Table 3. Consistent with the disjoint models, specification [3] indicates a general preference for more bathrooms and newly built properties. If the property is selling as a sheriff's sale, the model estimates the condominium will sell for 56.5% less than a similarly-suited condominium that is not a sheriff's sale.

Table 3. Results of Specifications 2 and 3.

	All Condominium Sales		Non-Sheriff's sales		Sheriff's sales		All Condominium Sales [Spec. 3]	
Variable	coeff.	t-stat	coeff.	t-stat	coeff.	t-stat	coeff.	t-stat
Bedrooms	-0.219***	-15.46	-0.18***	-14.42	-0.359***	-4.03	-0.2***	-15.75
Full Bath	0.158***	9.83	0.145***	10.44	0.288**	2.30	0.159***	10.81
Half Bath	0.016	1.12	0.024*	1.85	0.025	0.26	0.025*	1.93
Years Old	0.015	1.20	-0.013	-1.15	0.509	1.43	0.004	0.31
Years Old SQ	-0.013***	-5.08	-0.007***	-2.95	-0.108*	-1.74	-0.01***	-4.26
Fin. Sqft.	-1.095***	-2.65	-0.985**	-2.48	-1.018	-0.22	-1.038**	-2.52
Fin. Sqft. SQ	0.153***	5.17	0.144***	5.07	0.145	0.42	0.148***	5.03
Sheriff's sale							-0.565***	-12.36
const.	11.832	8.18	11.494	8.26	10.863	0.68	11.675	8.09
Obs.	3695		3523		172		3695	
F-stat	902.72		892.51		19		872.72	
Prob > F	0		0		0		0	
R-squared	0.8386		0.8654		0.6894		0.8611	
Root MSE	0.30585		0.26079		0.51774		0.28376	

***, **, and * indicate two-tailed significance at the 1%, 5%, and 10% levels, respectively.

The depreciated value of a sheriff's sale property should not come as a surprise and should be questioned for accuracy. The loss in community property value can be measured through the price won at auction for each property. Though it is possible to reasonably measure this loss in value, any commensurate change in value of the surrounding properties is misrepresented within the previous model. Through specification [4], it is possible to estimate the residual impacts on homes within the same community of the sheriff's sale. Table 4 outlines the results from specification [4] with various combinations of distance from the sheriff's sale property.

The results indicate that a condominium no more than 50 feet away from a sheriff's sale property selling within 30 days of the sheriff's sale has a residual loss in value of 22-24% for each sheriff's sale. This is the greatest observed loss in value for all distance-time combinations. The effect on residential transaction price of having a sheriff's sale nearby decays with respect to time and distance, individually and cumulatively.

Since additional sheriff's sales close to a condominium sale have a decreasing marginal effect, examining the impact from an existence of at least one sheriff's sale likely gives greater insight into buyer demand functions. To accomplish this, specification [4] is modified to only show existence through a dummy variable versus indicating the number of sheriff's sales. The results from this modification of specification [4] are indicated in Table 5.

The results indicated in Table 5 demonstrate patterns consistent with those in Table 4, including those condominiums selling within 30 days and 50 feet of a sheriff's sale having the largest loss in value, 31% - 34%. (The figures listed in Table 5 have been corrected using the method suggested by Halvorsen and Palmquist, 1980.) The pattern of time and distance having decreasing marginal effect, individually and cumulatively, is also consistent with the results in Table 4.

Table 4. Results of specification 4 using number of sheriff's sales and various time-distance combinations.

			Combination 1		Combination 2		Combination 3		Combination 4	
	Dist.	Months	coeff.	t-stat	coeff.	t-stat	coeff.	t-stat	coeff.	t-stat
SS	50	0-1	-0.224***	-3.38			-0.247***	-3.69		
SS	50	1-2							-0.078	-1.23
SS	50	1-3	-0.018	-0.40	-0.023	-0.56				
SS	50	3-6	-0.002	-0.05	-0.017	-0.45				
SS	50	6-12	-0.04	-1.50	-0.038	-1.36				
SS	625	0-1	-0.118***	-4.00			-0.185***	-5.66		
SS	625	1-2							-0.059***	-2.85
SS	625	1-3	-0.053***	-3.09	-0.066***	-3.93				
SS	625	3-6	-0.045***	-3.05	-0.05***	-3.41				
SS	625	6-12	-0.031***	-3.56	-0.038***	-3.98				
SS	1250	0-1	-0.068**	-2.38			-0.113***	-3.84		
SS	1250	1-2							-0.128***	-5.20
SS	1250	1-3	-0.059***	-3.53	-0.064***	-3.84				
SS	1250	3-6	-0.023*	-1.72	-0.025*	-1.86				
SS	1250	6-12	-0.017**	-2.34	-0.018**	-2.38				
SS	2640	0-1	-0.05***	-3.29			-0.053***	-3.15		
SS	2640	1-2							-0.058***	-2.94
SS	2640	1-3	-0.037***	-2.94	-0.039***	-3.09				
SS	2640	3-6	-0.018*	-1.80	-0.022**	-2.18				
SS	2640	6-12	-0.035***	-4.86	-0.036***	-4.72				
SS	5280	0-1	0.003	0.41			0.011	1.55		
SS	5280	1-2							0.005	0.58
SS	5280	1-3	0.004	0.68	0.006	0.92				
SS	5280	3-6	0.002	0.37	0.004	0.69				
SS	5280	6-12	-0.003	-0.68	-0.003	-0.65				
const.			9.097	6.36	9.344	6.55	10.870	7.78	10.943	7.80
Obs.			3523		3523		3523		3523	
F-stat			502.26		563.15		741.24		743.93	
Prob > F			0		0		0		0	
R-squared			0.8778		0.8756		0.8701		0.8678	
Root MSE			0.24921		0.25126		0.25641		0.25865	

***, **, and * indicate two-tailed significance at the 1%, 5%, and 10% levels, respectively.

Table 5. Results of specification 4 using sheriff's sale dummy and various time-distance combinations.

			Combination 1		Combination 2		Combination 3		Combination 4	
	Dist.	Months	coeff.	t-stat	coeff.	t-stat	coeff.	t-stat	coeff.	t-stat
SSD	50	0-1	-0.307***	-4.27			-0.335***	-5.16		
SSD	50	1-2							-0.087	-1.32
SSD	50	1-3	-0.029	-0.69	-0.036	-0.88				
SSD	50	3-6	0.007	0.18	-0.007	-0.18				
SSD	50	6-12	-0.102***	-3.36	-0.102***	-3.36				
SSD	625	0-1	-0.160***	-4.11			-0.231***	-5.31		
SSD	625	1-2							-0.075***	-2.91
SSD	625	1-3	-0.084***	-3.82	-0.099***	-4.36				
SSD	625	3-6	-0.056***	-3.1	-0.066***	-3.59				
SSD	625	6-12	-0.029**	-2.16	-0.036***	-2.52				
SSD	1250	0-1	-0.074***	-2.48			-0.112***	-3.62		
SSD	1250	1-2							-0.163***	-4.8
SSD	1250	1-3	-0.073***	-3.03	-0.080***	-3.33				
SSD	1250	3-6	-0.028	-1.66	-0.035**	-2				
SSD	1250	6-12	-0.029**	-2.14	-0.026*	-1.88				
SSD	2640	0-1	-0.059***	-2.64			-0.061***	-2.68		
SSD	2640	1-2							-0.083***	-3.54
SSD	2640	1-3	-0.062***	-3.63	-0.068***	-3.91				
SSD	2640	3-6	-0.043***	-3.28	-0.047***	-3.49				
SSD	2640	6-12	-0.020*	-1.68	-0.021*	-1.74				
SSD	5280	0-1	0.009	0.81			0.019	1.64		
SSD	5280	1-2							0.019	1.51
SSD	5280	1-3	0.011	1.06	0.017	1.6				
SSD	5280	3-6	0.011	1.02	0.015	1.43				
SSD	5280	6-12	0.037***	3.39	0.039***	3.56				
const.			9.979669	6.97	10.27037	7.16	10.94209	7.85	10.96548	7.79
Obs.			3523		3523		3523		3523	
F-stat			503.69		566.67		741.81		742.9	
Prob > F			0		0		0		0	
R-squared			0.875		0.8728		0.8693		0.8681	
Root MSE			0.25203		0.2541		0.25716		0.25839	

***, **, and * indicate two-tailed significance at the 1%, 5%, and 10% levels, respectively.

6. Conclusion

Local and regional community survival is contingent on the accrual of taxable property value. The tax revenue generated allows the community to provide such services as public schools and public safety. The administration of these services leads to the identification of tax revenue maximization as an objective function of the community. To accomplish this, all aspects of the community environment must be considered in order to marginalize those influences moving contrary to this objective function, including unobserved influences from foreclosure and sheriff's sale.

Based on the findings from this study, real neighborhood impacts result from a sheriff's sale of a property within the community. These impacts marginally decrease with respect to time from sheriff's sale and distance from sheriff's sale, individually and cumulatively. There are, however, several unresolved issues with the dataset. The period 6-12 months after the sheriff's sale was not included in the interpretation due to confounding with the prices. It is not clear whether inflation or home appreciation influenced the value of the home during the time between sheriff's sale and the arm's-length transaction. A method to accomplish this result would consist of converting all sale prices into a base nominal value, which should be investigated in future research.

The policy implications from this research highlight the need to understand community dynamics further than the individual home. Perhaps the greatest area of concern is for those properties within the same building as the sheriff's sale property. Regardless of the sheriff's sale control mechanism, the model indicates losses in value greater than 25% compared to comparable condominiums without a nearby sheriff's sale when within 30 days and 50 feet. What is unclear, though, is whether the shift is a result of supply and demand shifts or perceived market inequities. The ability to understand these forces will allow community leaders to react to arising community dynamics.

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