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Can Local Housing Ordinances Prevent Neighborhood Destabilization?

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This paper assesses the ability of local housing ordinances to prevent neighborhood destabilization. We evaluate the degree to which vacancy registrations and point-of-sale inspection requirements influenced housing market outcomes following the housing crisis. With comprehensive real property data from Cuyahoga County, Ohio, we measure outcomes that characterize housing market distress including foreclosures, sales below the tax-assessed value, bulk sales, flipping, and property tax delinquency. We compare outcomes across properties in regulated and unregulated municipalities using matching procedures on linked data containing property, loan, and transaction characteristics. We find evidence that vacancy registrations substantially reduce foreclosures. Registrations are also negatively associated with tax delinquency and sales below a property's tax-assessed value in some specifications. In contrast, we find little evidence that point-of-sale inspections reduce undesirable transactions. Rather, properties in cities with inspection requirements displayed higher levels of foreclosure and tax delinquency relative to the control group during the study period.

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1 Introduction

In recent years, hundreds of local jurisdictions across the country have passed foreclosure and vacancy registration ordinances to mitigate neighborhood destabilization. Before the housing crisis, 87 ordinances were on the books. The number exploded to 538 by 2012 (Lee et al., 2013). These local housing ordinances are being passed despite the fact that little is known about their effectiveness. This study seeks to inform these policy decisions by evaluating the performance of local ordinances that were in place before the housing crisis. Cuyahoga County, Ohio, contains the city of Cleveland and 57 of its suburbs. Sixteen of the county's suburban municipalities enacted housing ordinances prior to 2004. By comparing matched properties in cities with and without the ordinances, we are able to estimate the extent to which the ordinance protected neighborhoods from destabilization.

In this analysis, we estimate the impact of three types of housing ordinances - vacancy registrations, point-of-sale inspections, and point-of-sale inspections with escrow requirements - on five measures related to housing market stability: foreclosures; selling below tax-assessed value; bulk sales; flipping; and tax delinquency. Vacancy registrations enable cities to monitor vacancy and impose a cost on owners who fail to keep homes occupied. The point-of-sale inspection ordinances require that a licensed inspector report a home's defects to potential buyers. Inspection ordinances are intended to maintain the quality of the housing stock. We expect these ordinances to discourage unhealthy housing market transactions because they reduce the value of selling a home in poor condition "as is." Vacancy registrations increase carrying costs and should discourage property speculators who are trying to profit from short-term appreciation rather than attracting rental tenants. As the foreclosure crisis unfolded, these ordinances passed years earlier might have protected some municipalities from the worst types of neighborhood destabilization.

Using comprehensive real property data from Cuyahoga County, we match homes in cities with an ordinance in place prior to the housing crisis to homes in cities with no ordinance in place prior to the crisis. After controlling for a rich set of observables, we find that vacancy

registrations do seem to reduce foreclosure rates. The registrations are also consistently associated with lower incidence of sales below the tax-assessed value, bulk sales, and tax delinquency, and these relationships are significant in some specifications. On the other hand, we find evidence that point-of-sale inspections are associated with higher incidence of foreclosures and tax delinquency. There is some evidence that point-of-sale inspections appear to discourage flipping. While point-of-sale inspections might have other long-term benefits, it appears that vacancy registrations are better at improving the indicators of neighborhood stability that we are able to measure in this analysis.

The rest of the paper proceeds as follows. Section 2 describes the intent and function of the ordinances. Section 3 specifies the hypotheses and estimation methods. Section 4 describes the data and linking process, section 5 presents results, and the last section concludes.

2   Background

Cuyahoga County, like urban centers throughout the Midwest and Northeast, endured an epidemic of predatory real estate speculation during the foreclosure crisis (Kotlowitz, 2009). Lenders amassed huge inventories of real-estate-owned (REO) properties (Immergluck, 2011). They sold these properties in bulk and at steep discounts to speculators who resold them to less sophisticated investors (C. Coulton and Hirsch, 2010). This "flipping" activity is usually accompanied by extended periods of vacancy, and it allows the housing stock to deteriorate and be vandalized (Fitzpatrick IV and Whitaker, 2012; Whitaker, 2011). Unsophisticated investors, surprised by the major repairs the homes need, often dumped the properties for less than their tax-assessed value. In other cases, investors quit paying the property taxes and abandon the homes (Ergungor and Fitzpatrick IV, 2011).

Foreclosures and flipping by neglectful investors can have devastating effects on the property values of nearby homes (Whitaker and Fitzpatrick IV, 2013). Neighborhoods are desta-

bilized when they experience a vicious cycle of discounted foreclosed homes lowering property values, and falling property values forcing underwater borrowers into foreclosure. Foreclosed homes are more likely to become vacant, abandoned, and blighted properties, which can drive away a neighborhood's current residents and potential buyers. The local ordinances studied here are considered neighborhood-stabilization policies because they aim to prevent, slow, or stop these downward spirals.

The most common ordinances require registration of foreclosed or vacant property or require pre-sale inspections and an escrow account.[1] The details of the ordinances vary, but, generally, a corporation or individual that owns a vacant property in a city with a registry must repeatedly (monthly, quarterly, or annually) complete registration paperwork and pay registration fees. Complying with these ordinances can be a significant cost, especially in terms of staff time, for managers of large REO portfolios. Registered properties are often subject to additional periodic inspections for code violations. While not recurring, point-of-sale inspections require additional time, expense and effort when undertaking a property transaction. These ordinances require an inspection of each home before it can be sold. Where escrow accounts are required, the seller or buyer must deposit sufficient funds to make needed repairs before the transfer of title is allowed. In either case, the buyer receives the most recent inspection report. While buyers in any city can (and often do) voluntarily pay for an inspection, inspections are not normally required by law or by lenders. Lenders do require appraisals based on comparable sales, but appraisers do not look for maintenance problems as inspectors do. Inspection ordinances should provide an incentive for property owners to keep up with preventative maintenance. If they do not, they may face large repair expenses when they attempt to sell their house.

Despite the existence of several extensive related literatures, evaluations of local policies in light of the housing crisis are still rare. In the urban, real estate, and housing economics literatures, there are many evaluations longstanding federal housing programs, such as the

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[1]The foreclosure registry requirements in Cuyahoga County were implemented after the foreclosure crisis, so we cannot evaluate them. We only attempt to evaluate the pre-crisis vacancy registration ordinances.

Low Income Housing Tax Credit (Baum-Snow and Marion, 2009; Eriksen and Rosenthal, 2010; Quigley, 2000). There is a substantial literature on local land use laws that can impact housing markets by allowing or restricting supply growth (Glaeser and Gyourko, 2003; Speyrer, 1989). The capitalization of local property taxes into home prices has been well understood for decades (Oates, 1969). There have been estimates of the capitalization of other local public policies, such as school quality (Downes and Zabel, 2002) and hurricane-resistance building codes (Dumm et al., 2011).

A few studies have looked at the interaction of local policies and the housing crisis. Glasgow, Lewis, and Neiman present evidence that California cities with more restrictive development policies suffered less following the housing bust (2012). Johnson and Turcotte develop a model that determines which foreclosed properties a municipality should purchase to minimize the social costs caused by the distressed properties (2010). Our analysis is like Glasgow, Lewis and Neiman's work in that we are interested in policies that were in place before the crisis, not enacted as a response. We share with Johnson and Turcotte a focus on distressed properties. Preventing properties from becoming distressed, or mitigating that distress, can help maintain the values of neighboring homes according to the now numerous estimates of a distressed property's externalities (Biswas, 2012; Campbell et al., 2011; Harding et al., 2009; Immergluck and Smith, 2006; Leonard and Murdoch, 2009; Lin et al., 2009; Rogers and Winter, 2009; Schuetz et al., 2008; Whitaker and Fitzpatrick IV, 2013). Our contribution to this literature is evaluating local policies that were both aimed at preventing distressed properties and in place before the housing crisis.

3   Hypotheses and Methods

As in other old industrial cities, decades of population decline have generated a growing stock of vacant and abandoned properties in Cleveland and some of its inner-ring suburbs. As a result, in the 1990s and early 2000s, local housing ordinances in Cuyahoga County, Ohio,

were enacted in some cities to gather information about or directly mitigate neighborhood blight. We investigate whether these cities were better able to weather the foreclosure crisis in comparison to neighboring cities that did not have pre-crisis housing ordinances. In order to explore this question, we focus on sales taking place during the housing "boom" years of 2004 and 2005. We compare outcomes of sold homes in treated and untreated cities on several measures of housing distress: foreclosures, sales below the assessed value, bulk sales, flips, and tax delinquency.

In table 1, we summarize the possible relationships between the vacancy registrations and point-of-sale inspections and the outcomes. The lines prefaced by a minus (-) suggest why we could expect a negative impact of the treatment on the outcome. The lines led by a plus sign (+) give reasons the treatment might increase the measured value of the outcome. Several treatments could have both positive and negative channels of influence, so our estimates will reflect the net impact of the treatments. If the inspections are accompanied by an escrow requirement, we assume the deficiencies identified by the inspector are repaired before or soon after the transaction. Without the escrow requirement, the buyer may opt to ignore the suggested repairs, but we assume they will have to be compensated by a lower sale price.

Point-of-sale inspections and vacancy requirements are intended to directly or indirectly maintain property values. Strong property values can, in turn, affect each of the measured outcomes. If home values remain steady, owners can sell their homes and repay their mortgages even if they receive a negative income shock. Bulk sales and flipping are less likely if high home prices are beyond the reach of amateur speculators. High home values will motivate lenders and investors to continue paying property taxes to protect their asset from tax foreclosure.

In the short run, however, point-of-sale inspections can create substantial costs, and even hardship for homeowners. If inspections reveal the need for costly repairs, the seller has to bear those costs immediately, either by paying for the repair or lowering the sale price. In the absences of the inspections, the cost will probably eventually be borne by the buyer, but

this could be delayed by years.[2]

The vacancy registration is best thought of as a tax on vacancy and an additional carrying cost for any owner other than an owner occupant. Fees associated with the registrations are small relative to the property taxes, but the value of time needed to comply with the regulation could be higher, especially for an investor or lender with a large portfolio. This additional cost should motivate lenders to foreclose less aggressively. It should motivate institutional owners to divest of their properties faster than usual, by lowering prices if necessary.

The housing ordinances may have had unintended impacts on foreclosures and subsequent transactions. There is a general concern expressed by the lending and servicing community that vacancy registrations and point-of-sale inspection ordinances, among others, will "create impediments to smooth foreclosures" (Pollard, 2012). Anti-vacancy and anti-blight ordinances may provide an incentive for banks to foreclose less or less quickly on low-value property. Because the ordinances would increase the probability of being caught violating housing codes, lenders may be wary to take ownership of property that is already in violation of housing codes. Registry compliance costs could eat into a lender's expected recovery value and cause additional "bank walk-aways" in marginal cases. These incentives could contribute to the stability of a neighborhood by decreasing foreclosures. However, borrowers who are in default due to financial hardship may also stop maintaining the home or leave the home vacant if they assume a foreclosure will be initiated soon. When the banks do foreclose on low-value properties, the laws could also encourage them to surrender the REO inventory to land banks or similar entities that can demolish or rehabilitate the homes.

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[2]In thinking about the point-of-sale inspections, we had in mind the following example. A borrower purchases a home in 2004 for $120,000 with 20 percent down and a $96,000 mortgage. By 2008, the home has depreciated 10 percent to $108,000, and the outstanding balance on the loan is $91,000. The borrower needs to sell the house to relocate. She believes she has $17,000 in equity to use toward her next down payment. A buyer offers $108,000, but the point-of-sale inspection reveals that a $20,000 repair is needed. Now the seller is underwater. If she can, she must borrow or take funds out of savings to cover the repair. She may decide that letting the home go into foreclosure is her best or only option. If scenarios like this are common enough, they could cause point-of-sale inspections to have a net positive impact on foreclosures.

Outcome	Point-of-sale inspections		Vacancy Registration	
Foreclosure	-	Eliminate "surprise" repairs that cause financial hardship and default	-	Maintain neighborhood property values so distressed borrowers can sell their homes to avoid foreclosure
	-	Introduce a third party, the inspector, and some delay; This might discourage high-pressure sales of the high-cost loans that more frequently end in foreclosure	-	Discourage flip investors, which lowers banks' expected recovery value and encourages loan modifications or bank walk-aways
	-	Maintain neighborhood property values so distressed borrowers can sell their homes to avoid foreclosure		
	-	Discourage flip investors, which lowers banks' expected recovery value and encourages loan modifications or bank walk-aways		
	+	May identify costly repairs that push homeowners underwater and force them into foreclosure		
Bulk Sales and Flipping	-	Increase transaction costs, which discourage flipping; reduced opportunity to flip discourages bulk buying	-	Increase carrying costs, which decreases the profitability of buying homes in bulk and flipping them
	-	Decrease information asymmetries and alert naive investors if homes are low-quality		
	-	Maintain neighborhood property values, which makes homes too expensive for amateur cash investors		
	-	May reduce foreclosures, reducing the REO inventory that can enter a flipping cycle		
	+	May increase foreclosures, increasing the REO inventory that can enter a flipping cycle		
Selling below assessed value	-	Maintain the condition of the neighborhood's housing stock by forcing repairs at the time of sale	-	Maintain neighborhood property values and keeps sale prices above the assessed values
	-	Motive owners to fix problems early and avoid more costly repairs at the time of sale; Better maintained homes retain their value	+	Fees, like property taxes, are capitalized into home prices; Investors must plan to pay these when they have periods of vacancy between tenants
	+	Reveal the need for expensive repairs; Sellers must drastically reduce the sale price to allow part of the buyer's down payment to be used for the repair, or to compensate the buyer for accepting the home as-is	+	Increase carrying cost, which encourages sellers to reduce their time on market by lowering prices
Tax delinquency	-	Maintain neighborhood property values and discourages owner or bank walk-aways	-	Maintain property values, which discourages owner and bank walk-aways
	+	Discourage flip investors, which lowers banks' expected recovery value and encourages walk-aways	+	Increases carrying costs, which encourages owner and bank walk-aways

Table 1: Hypothesized channels of influence relating local housing ordinances to measures of neighborhood destabilization.

To test these hypotheses, we match homes treated by ordinances with homes untreated by ordinances. A sold home is considered treated if it is in a city that has enacted any one or more of these ordinances before 2004. After 2004 some cities enacted rules as a direct response to the foreclosure crisis, which makes the treatment clearly endogenous. In this later period, we would expect to find higher levels of housing distress in places with recently instituted ordinances. We restrict our definition of treatment to earlier ordinances that were a response to the long-term problems of vacancy and abandonment in the region. While treatment assignment is by no means random, we believe that selection into treatment at the city level does not convey knowledge of the future housing market collapse.

Of the 58 municipalities in Cuyahoga County, 30 of them have at least one of the following ordinances: point-of-sale inspections with or without escrow; vacancy registration; or foreclosure registration. For our analysis we are interested in municipalities with ordinances enacted prior to the housing crisis, which we define as pre-2004. Nineteen municipalities meet these criteria. The remaining 11 municipalities enacted ordinances after 2004. We further limit the 19 municipalities to only those with enforced ordinances. This results in a treatment group of 16 municipalities. Our potential control group is comprised of 32 municipalities with either none of these ordinances in place or those that enacted ordinances post-crisis, which we define as post-2008. There are 28 municipalities in Cuyahoga County with none of these ordinances in place and four municipalities which enacted ordinances after 2008. The treated and untreated cities, as well as their contributions to the matched sales, are illustrated in Figure 1.
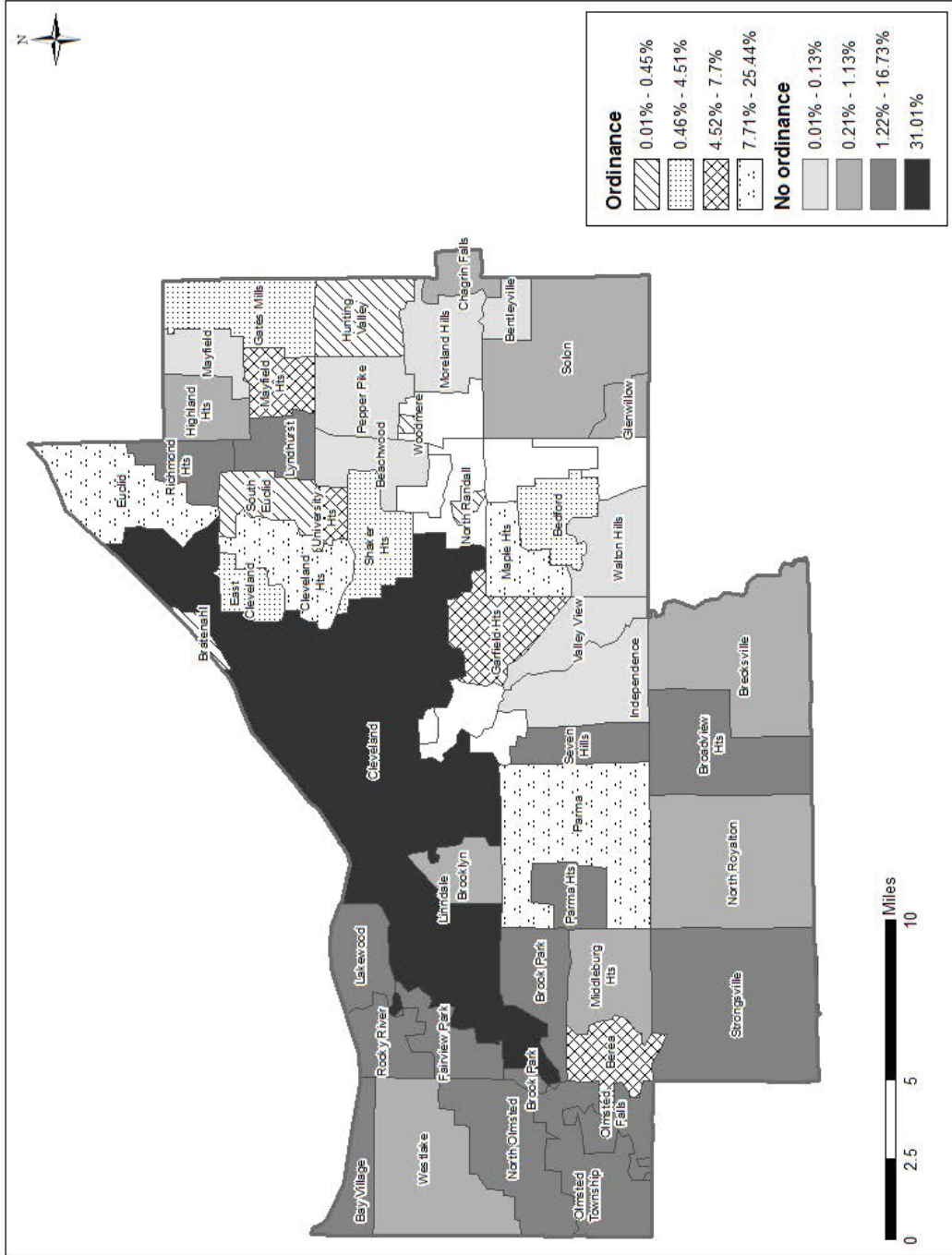
Figure 1: Distribution of matched sales within cities with and without housing ordinances in Cuyahoga County, Ohio. Cities that are unshaded and unlabeled could not be included in the analysis because they passed housing ordinances during the study period.

It is possible that the underlying causes that led cities to enact pre-2004 ordinances may also be the underlying factors that explain the housing outcomes we measure post-2004. For example, cities with local governments that are very concerned about housing blight may have been more likely to enact and enforce ordinances early on to better understand or attempt to address the problem. This, in turn, may have better prepared them to respond to the following housing downturn. Thus, finding that ordinance properties fair better than those without an ordinance could be explained by the focus of local government leaders rather than the ordinances themselves. Alternatively, early ordinances could be a response to higher levels of blight at which externalities of distressed housing are higher. If this is the case, we would expect to find a negative correlation between ordinances and good housing outcomes, with the underlying cause being that cities with ordinances faced larger externalities at the onset of the housing crisis. Given these identification issues, the assumption of strong ignorability is made only after matching properties over a rich set of variables at the parcel, neighborhood, transaction and borrower levels.

To clarify the identification strategy, we are interested in estimating the mean difference in outcomes due to the ordinance, which is the treatment effect on the treated. We do not observe realizations for the counterfactual, which is the outcome for a property in an ordinance city, had it not been subject to the ordinance. Instead, we must create a proxy for the counterfactual using the outcomes for untreated properties in cities without ordinances. Strong ignorability implies that the control variables are rich enough to eliminate the bias originated when using this proxy for the counterfactual. We are aware that this is a strong assumption, so we are careful to build a rich set of observable covariates and account for them through matching using a propensity score matching criteria. In the estimated propensity score equation, the coefficients serve as weights that reflect the relative strength of the correlations between the covariates and the treated status. These weights should create a close alignment of the distributions of the observables and unobservables in the treated and

untreated samples.[3]

Propensity score matching techniques are usually applied in situations where individual units of observation are selected into treatment (Rosenbaum and Rubin, 1983). However, in this analysis, homes are selected into treatment in groups defined by their municipality. All homes in a municipality are either treated or untreated. Matching at the city level is not practical because the counts of cities are too small to support hypothesis testing. Matching at the tract level is possible. However, aggregating the data breaks the connection between the property and loan characteristics and the outcomes observed for individual houses. The propensity score is defined as the probability that a property is treated conditional on its characteristics ($P(T = 1|X)$), which lacks a direct interpretation in the ordinance effect problem. We can argue that selection into treatment occurs at the city level, in response to earlier, city-wide housing distress. Selection could possibly occur at the owner occupant level if local ordinances were to influence the decision to buy across cities. So while it is not possible to interpret the propensity score as the probability that a property selects into treatment (the ordinance), we can say that estimates of probability of treatment ($P(T = 1|X)$) from a logistic regression provide a score of the likelihood that the property belongs to a distribution that is observationally similar to the distribution of properties subject to ordinances.

4   Data

We use data from the following sources: Home Mortgage Disclosure Act (HMDA), Cuyahoga County Recorder, Cuyahoga County Auditor, the Decennial Censuses and the American Community Survey.[4] HMDA contains loan level data on loan characteristics such as lending

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[3]Formally, let Y_{1i} and Y_{0i} be outcomes for property i when the property is ($T = 1$) and is not ($T = 0$) subject to the ordinance, respectively. We are estimating the treatment effect on the treated (TT): $E(Y_1 - Y_0|T = 1)$. We do not observe realizations for the counterfactual $Y_0|T = 1$, but we do observe realizations of $Y_0|T = 0$. Strong ignorability implies that the control variables in X are rich enough to eliminate the bias originated when using parameters of the observed variable $Y_0|T = 0$ to proxy for the unobserved $Y_0|T = 1$, so that $E(Y_0|T = 1, X) - E(Y_0|T = 0, X) = 0$.

[4]A reorganization in 2011 has placed the functions of the Auditor and Recorder under the Cuyahoga County Fiscal Officer. Census tract level variables were extracted from the NEO CANDO database at the

institution, origination date, loan amount, and loan type, as well as borrower characteristics such as income. Linking to HMDA mortgage data allows us to estimate ordinance effects for properties sold via a mortgage or cash transaction. The recorder data contains information on the lending institution, loan amount, parcel, and the date the mortgage deed was recorded. Sales transactions data come from the Cuyahoga County Auditor and include sale date, sale price, deed type, buyer, seller, and parcel. Property characteristics such as year built, square footage, and the number of units in the property are also provided by the Auditor.

HMDA and Recorder data are linked based on lending institution, loan/deed amount, origination date, and census tract. Then, Auditor data is linked by parcel number. We use a probabilistic linkage procedure to link the HMDA and Cuyahoga County Recorder data. The linkage software used, *Link Plus*, is made available by the Centers for Disease Control.[5] Census tract is taken to be a blocking variable. Linkages with loan amount differences within $1,000 and origination date differences within a year are allowed. The data on lender names are cleaned to increase precision. About 75 percent of the sales data are linked.

For transactions taking place in the 2004-2005 period, the data is blocked by property type (one or more units), occupancy type (owner or renter), and transaction type (cash, prime mortgage, subprime mortgage). Within each block, matching is performed based on the following variables: sale price, square footage, vintage, and neighborhood characteristics such as percent owner occupancy, percent non-high school graduates, percent college graduates, percent black households, median income, unemployment rate, median home value in 2004, percent of non-depository loan originations in 2004, and property tax rate. Stata's *psmatch2* is used to implement the procedure (Leuven and Sianesi, 2003).

Since properties can transact more than once in the 2004-2005 period, we use the transaction closest in time to January 1, 2004, and we find a match based on sale, parcel and

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neighborhood characteristics among properties not subject to the ordinances that transacted in 2004 or 2005. With the parcel number, we can track all subsequent transactions. The outcome variables are defined as follows:

- Early Foreclosure: if the house went into tax or mortgage foreclosure and was sold at sheriff's sale within two years after the first sale.

- Foreclosure: if the house went into tax or mortgage foreclosure, and the next sale was at a sheriff's auction, any time after the first sale.

- Sale Below Assessed Value: if the next sale price was below the most recent assessed value in the property tax records. Tax-assessed values in Cuyahoga County are intended to be below market values, so a sale price that is lower yet indicates a large, recent decline in value.

- Bulk Sale: if the next sale is part of a bulk sale. Sales are identified as "bulk" if the sale is one of several sales recorded with the same seller and the same buyer on a single day.

- Flip: if the house was re-sold within the first two years after the first sale (not including sales out of REO).

- Tax Delinquency: if the property was tax current before the first sale and becomes tax delinquent before it resells.

We are also interested in seeing whether there is an impact of the ordinances on outcomes beyond the next sale and outcomes for homes that have not sold recently. Table 3 describes two additional sets of outcomes. The second set of variables are counts summed from 2006 through 2008. The counts measure the number of times the property sold at sheriff's sale (foreclosure), sold within two years of the previous sale (flip), sold below its assessed value, or was tax delinquent. Finally, we measure the outcomes for a set of matched parcels. This removes the conditioning on a sale in 2004 or 2005, and allows us to see if ordinances are

reducing undesirable sales transaction by reducing all sales. It also offers insight into neighborhood stability by measuring instability relative to the whole community. For example, people who purchased homes in the 1990s would not appear in the matched sales data, but if their neighborhood has been destabilized they could go into foreclosure, sell their homes below the assessed value, or sell their homes to a flipper. The parcel measures are counts of the specified status or transaction in 2006 through 2008. The parcel matching and regressions do not make use of loan or borrower data because this information is not available for the homes that did not sell recently.

Summary statistics of the linked and matched data are presented in table 2. Properties sold in the 2004-2005 period in ordinance cities are located in neighborhoods that have higher owner-occupancy, lower unemployment and lower home values. There is much more variation of house prices in the larger, untreated group. After matching by property, we end up with 9,483 sales in the matched treated group out of 13,380 sales in the treated municipalities. The matching technique, by design, results in distributions of the propensity score that are nearly identical. The distributions of the variables that contribute to the score are much more similar after the matching, but some differences remain. We include all the components of the score, such as house price, square footage, and college attainment, in the regressions to account for the differences that remain.

Properties Sold in 2004 or 2005	All observations				Matched observations			
	Ordinance N=13,380		No Ordinance N=34,906		Ordinance N=9,482		No Ordinance N=9,483	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
FHA VA Loan	0.07	0.26	0.04	0.20	0.08	0.26	0.06	0.24
Rental Mortgage	0.08	0.26	0.08	0.28	0.06	0.23	0.06	0.23
High Cost Loan	0.14	0.35	0.12	0.33	0.13	0.34	0.13	0.34
Cash (no loan data)	0.39	0.49	0.43	0.49	0.38	0.49	0.38	0.49
Vintage	1945.27	20.35	1947.05	33.43	1946.33	19.99	1949.03	26.21
Square Feet	1,525.12	608.17	1,701.50	717.39	1,484.17	566.49	1,483.92	566.30
Multifamily	0.08	0.26	0.14	0.35	0.03	0.17	0.03	0.17
% Black	24.73	29.83	22.30	35.50	19.57	25.74	13.01	29.47
% Owner Occupied	72.78	18.39	66.88	21.65	74.34	17.88	75.72	17.80
Median Income	45.21	16.60	44.75	20.15	45.76	16.95	47.52	13.67
% No High Sch. Deg.	14.96	7.34	19.21	13.28	15.03	6.87	13.69	8.60
% College Grad	26.96	19.51	24.57	16.97	26.26	19.01	26.98	13.67
Unemployment	4.97	3.50	6.53	5.55	4.72	3.02	4.04	3.13
04 Median Home Price	130.36	59.60	141.80	82.71	131.03	56.77	138.87	54.31
06 Property Tax Rate	0.02	0.00	0.02	0.00	0.02	0.02	0.02	0.04

All Property Parcels	All observations				Matched observations			
	Ordinance N=118,840		No Ordinance N=286,467		Ordinance N=102,943		No Ordinance N=102,943	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Vintage	1945.06	19.74	1947.13	31.06	1946.61	19.69	1945.33	26.24
Square Feet	1,563.19	700.46	1,735.66	752.31	1,577.89	717.04	1,657.10	659.53
Multifamily	0.06	0.24	0.13	0.33	0.06	0.24	0.06	0.24
% Black	23.22	29.30	21.53	35.48	19.39	25.98	11.57	27.69
% Owner Occupied	73.61	18.32	69.16	21.83	74.51	18.00	73.16	19.96
Median Income	46.13	18.21	46.60	21.33	46.54	18.72	47.82	14.68
% No High Sch. Deg.	14.83	7.09	18.52	12.86	14.87	6.83	13.68	8.74
% College Grad	26.73	19.21	25.13	17.09	26.45	18.89	27.53	13.75
Unemployment	4.80	3.24	6.29	5.54	4.69	3.08	4.01	3.20
04 Median Home Price	133.87	66.95	146.16	84.04	134.39	65.87	142.29	56.49

Table 2: Descriptive Statistics. Data sources include the Cuyahoga County Fiscal Officer (property transactions and characteristics), Home Mortgage Disclosure Act (loan and borrower characteristics), and the American Community Survey (neighborhood characteristics).

5 Results

In table 3, we see that the ordinance cities have significantly lower mean values in only two instances among the seventeen distress measures. Ordinance cities have significantly higher means for twelve of the measures. In a pure matching strategy, the difference between the mean outcomes of the treated and untreated groups serves as the estimate of the treatment effect. The mean differences here contrast treatment with any ordinance versus no ordinance. However, because we are interested in the effects of three distinct ordinances, and some cities require both registrations and inspections, we need to estimate models with indicators of the specific treatments. At the same time, we can control for the property-specific characteristics observable in our data.

	Matched Sales					
	Ordinance N=9,482		No Ordinance N=9,483			
Variable	Mean	SD	Mean	SD	Mean(t-stat)	Median(χ^2)
First Subsequent Sale						
Early Foreclosure	0.011	0.106	0.009	0.097	1.287	1.477
Foreclosure	0.136	0.343	0.116	0.321	4.115***	16.740***
Sell <Assessed	0.198	0.398	0.185	0.388	2.219**	4.842**
Bulk Sale	0.004	0.066	0.005	0.069	-0.322	0.046
Flip	0.066	0.249	0.083	0.275	-4.286***	18.118***
Become Tax Delinquent	0.109	0.312	0.076	0.265	7.835***	60.799***
Transactions or Status in 2006, 2007 and 2008						
Foreclosed	0.074	0.262	0.065	0.247	2.309**	5.084**
Sales <Assessed	0.116	0.352	0.099	0.320	3.436***	8.352***
Bulk Sales	0.004	0.070	0.004	0.070	0.209	0.062
Flips	0.060	0.255	0.055	0.239	1.147	0.546
Tax Delinquent	0.318	0.719	0.237	0.621	8.342***	69.921***

	Matched Parcels					
	Ordinance N=102,943		No Ordinance N=102,943			
Variable	Mean	SD	Mean	SD	Mean(t-stat)	Median(χ^2)
Transaction or Status in 2006, 2007 and 2008						
Non-Distress Sales	0.189	0.422	0.181	0.414	4.306***	18.550***
Early Foreclosures	0.003	0.059	0.002	0.050	4.035***	15.470***
Foreclosures	0.040	0.197	0.030	0.171	12.526***	154.280***
Sales <Assessed	0.080	0.290	0.073	0.275	5.632***	26.006***
Bulk Sales	0.002	0.050	0.003	0.055	-2.604***	8.324***
Flips	0.015	0.128	0.013	0.119	2.583***	4.696**
Tax Delinquent	0.209	0.594	0.182	0.555	10.560***	107.731***

Table 3: Descriptive Statistics - Outcomes. Data sources include the Cuyahoga County Fiscal Officer (property transactions and characteristics), Home Mortgage Disclosure Act (loan and borrower characteristics), and the American Community Survey (neighborhood characteristics). Significance Key: *** $p<0.01$, ** $p<0.05$.

Table 4 displays results for a series of regressions on the outcomes of interest related to the subsequent sale. Table 5 presents results for the outcomes measured over a three-year window, and tables 6 present results for the matched parcels estimates. The coefficients on the vacancy registration indicator are negative for all but one outcome (flips in 2006-2008) in tables 4 and 5. Vacancy registrations appear to discourage foreclosures both in the first sale after 2004-2005 and at any time during 2006-08. The incidence of the first subsequent sale (table 4) being below the assessed value is significantly lower in the presence of a vacancy registration. Recall that this could be because the vacancy registration is helping to maintain property values. Alternately, the registration requirement could be discouraging bank foreclosures and discouraging low-price investors by raising the expected carrying costs of the properties. The 9,483 treated properties in the matched sample actually experienced 1,289 foreclosures in the study period. The model implies that if the vacancy registration ordinance were not in place, the foreclosure rate would be 17.2 percent, rather than 13.6 percent. The models also imply that, absent the registrations, share of sales below the assessed value would have been 22.8 percent rather than the 19.8 percent observed.

Inspections and inspections with escrow appear to reduce the incidence of flipping by approximately one third in table 4. This is consistent with inspections imposing transaction costs and discouraging investors from using a business model that requires numerous quick transactions. Unfortunately, inspections also appear to have the net effect of increasing foreclosures and tax delinquency. In the first subsequent sale, inspections display a significant, positive relationship to foreclosure. Despite any success the inspections have in sustaining the level of maintenance in the housing stock, it appears they do not succeed in protecting enough equity to allow distressed homeowners to sell and avoid foreclosure. Inspections with escrow also have a positive relationship, but it is only marginally significant. The matched sale regressions indicate that tax delinquency is significantly higher (by 15 to 28 percent) in municipalities with inspection ordinances.

	Early Foreclosure	Foreclosure	Sale Price <Assessed	Bulk	Flip	Tax Delinquent
Vacancy Registration	−0.002	−0.036∗∗∗	−0.030 ∗ ∗	−0.001	−0.005	−0.003
	(0.002)	(0.008)	(0.010)	(0.002)	(0.007)	(0.007)
Inspection	0.002	0.049∗∗∗	0.013	0.001	−0.021∗	0.023∗
	(0.002)	(0.011)	(0.012)	(0.002)	(0.010)	(0.010)
Inspection w/ Escrow	−0.001	0.019+	−0.007	0.001	−0.023∗	0.030∗∗∗
	(0.002)	(0.010)	(0.012)	(0.003)	(0.010)	(0.009)
FHA VA Loan	−0.005∗∗∗	0.052∗∗∗	−0.012	0.000	−0.006	−0.029∗∗∗
	(0.001)	(0.013)	(0.014)	(0.002)	(0.006)	(0.006)
Rental Mortgage	0.008+	0.001	0.030	−0.001	0.142∗∗∗	0.028
	(0.005)	(0.019)	(0.022)	(0.002)	(0.027)	(0.022)
High Cost Loan	0.009 ∗ ∗	0.231∗∗∗	0.199∗∗∗	−0.001	0.024+	0.185∗∗∗
	(0.004)	(0.021)	(0.023)	(0.001)	(0.014)	(0.018)
Cash (no loan data)	0.013∗∗∗	0.001	0.131∗∗∗	0.004 ∗ ∗	0.074∗∗∗	0.080∗∗∗
	(0.002)	(0.008)	(0.010)	(0.001)	(0.009)	(0.008)
Vintage	−0.000∗∗∗	−0.001∗∗∗	−0.001∗∗∗	0.000	0.001∗	−0.000+
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Square Feet	0.000∗	−0.000∗∗∗	0.000	−0.000	0.000∗∗∗	0.000 ∗ ∗
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Multifamily	−0.007	0.039+	−0.038	0.003	−0.077∗∗∗	−0.014
	(0.005)	(0.020)	(0.025)	(0.005)	(0.016)	(0.017)
% Black	0.000 ∗ ∗	0.001 ∗ ∗	0.002∗∗∗	0.000+	0.000	0.001∗∗∗
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
% Owner Occupied	−0.000+	0.000	−0.001	−0.000	0.001 ∗ ∗	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Median Income	0.000+	0.001	0.001+	0.000	−0.000	−0.000
	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)
% No High school	0.000	0.002+	0.001	0.000+	0.001	0.001
	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)
% College Grad	−0.000∗	−0.003∗∗∗	−0.001∗	−0.000	0.002∗∗∗	−0.001
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)
Unemployment	0.000	−0.002	0.003	−0.001∗	0.001	0.002
	(0.001)	(0.002)	(0.002)	(0.000)	(0.002)	(0.002)
Median Home Price 2004	0.000	−0.000	0.000	−0.000	0.000 ∗ ∗	0.000+
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Sale Price	−0.000 ∗ ∗	0.000∗∗∗	−0.001∗∗∗	0.000	−0.001∗∗∗	−0.000∗∗∗
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Property Tax Rate	0.142	1.768	1.834	0.190	2.902	1.376
	(0.478)	(1.645)	(2.182)	(0.512)	(2.411)	(1.737)
2005	0.011∗∗∗	−0.026 ∗ ∗	0.005	0.002+	−0.014	0.018 ∗ ∗
	(0.002)	(0.008)	(0.007)	(0.001)	(0.010)	(0.006)
Constant	0.289∗∗∗	1.604∗∗∗	1.828∗∗∗	−0.026	−1.377∗	0.602+
	(0.087)	(0.383)	(0.456)	(0.163)	(0.659)	(0.364)
R^2	0.02	0.09	0.10	0.00	0.07	0.11

Table 4: Results - Matched Sales. N=18,965. Standard errors are clustered by census tract. Significance Key: *** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.1$. Data sources include the Cuyahoga County Fiscal Officer (property transactions and characteristics), Home Mortgage Disclosure Act (loan and borrower characteristics), and the American Community Survey (neighborhood characteristics).

	Foreclosure 2006-2008	Sale <Assessed 2006-2008	Bulk 2006-2008	Flip 2006-2008	Delinquent 2006-2008
Vacancy Registration	−0.018 ∗∗	−0.002	−0.002	0.002	−0.001
	(0.007)	(0.007)	(0.002)	(0.006)	(0.015)
Inspection	0.009	0.008	0.001	−0.001	0.066 ∗∗
	(0.010)	(0.010)	(0.002)	(0.007)	(0.023)
Inspection w/ Escrow	−0.002	−0.009	0.001	−0.005	0.049∗
	(0.010)	(0.011)	(0.003)	(0.007)	(0.019)
FHA VA Loan	−0.038∗∗∗	−0.023 ∗∗	−0.002∗∗∗	−0.006	−0.077∗∗∗
	(0.005)	(0.008)	(0.001)	(0.006)	(0.012)
Rental Mortgage	0.012	0.049 ∗∗	−0.001	0.076∗∗∗	0.073
	(0.012)	(0.015)	(0.001)	(0.015)	(0.058)
High Cost Loan	0.143∗∗∗	0.101∗∗∗	0.000	0.023∗	0.546∗∗∗
	(0.017)	(0.017)	(0.001)	(0.009)	(0.041)
Cash (no loan data)	0.039∗∗∗	0.106∗∗∗	0.005∗∗∗	0.068∗∗∗	0.227∗∗∗
	(0.007)	(0.009)	(0.001)	(0.006)	(0.017)
Vintage	−0.000	−0.001∗	0.000	−0.000	−0.001 ∗∗
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Square Feet	0.000	0.000	−0.000	0.000∗	0.000 ∗∗
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Multifamily	−0.007	−0.026	−0.001	−0.044∗∗∗	−0.055
	(0.018)	(0.022)	(0.003)	(0.012)	(0.038)
% Black	0.001 ∗∗	0.001 ∗∗	0.000∗	0.000	0.003∗∗∗
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
% Owner Occupied	0.000	−0.000	−0.000	0.000	−0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Median Income	0.001	0.001∗	0.000+	0.000	0.000
	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)
% No High school	0.001	0.001	0.000	0.000	0.002
	(0.001)	(0.001)	(0.000)	(0.001)	(0.002)
% College Grad	−0.002 ∗∗	−0.000	0.000	0.001∗	−0.003∗
	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)
Unemployment	0.002	0.007 ∗∗	−0.001	0.004∗	0.008∗
	(0.002)	(0.002)	(0.000)	(0.002)	(0.004)
Median Home Price 2004	0.000	0.000	−0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Sale Price	0.000	−0.000 ∗∗	−0.000	−0.000∗∗∗	−0.001∗∗∗
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Property Tax Rate	3.698+	1.310	0.776	0.645	4.489
	(2.178)	(1.773)	(0.678)	(1.288)	(4.047)
2005	−0.036∗∗∗	0.012	−0.001	0.048∗∗∗	0.060∗∗∗
	(0.007)	(0.009)	(0.002)	(0.005)	(0.016)
Constant	0.828	1.025∗	−0.205	0.129	2.206∗
	(0.831)	(0.424)	(0.250)	(0.248)	(0.870)
R^2	0.09	0.07	0.00	0.05	0.16

Table 5: Results - Matched Sales (2). N=18,965. Standard errors are clustered by census tract. Significance Key: *** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.1$. Data sources include the Cuyahoga County Fiscal Officer (property transactions and characteristics), Home Mortgage Disclosure Act (loan and borrower characteristics), and the American Community Survey (neighborhood characteristics).

In the parcel models (table 6), vacancy registrations are again associated with lower values on all the distress measures. The relationship is significant for foreclosures and tax delinquency. In the case of foreclosures, the ordinance could be supporting home values or discouraging banks from foreclosing on low-value properties. Of the 102,443 treated parcels, 4,098 passed through foreclosure in the study period. The estimates suggest the vacancy registration reduced the foreclosures per parcel from 0.047 to 0.040.

Point-of-sale inspections are associated with significantly higher probability that a parcel will transfer in an non-distress sale during the study period.[6] The point-of-sale ordinance is estimated to increase the incidence of foreclosure by 0.009, which is a substantial increase relative to the treatment mean of 0.04.

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[6]We define non-distress sales as those that do not involve a foreclosure, an exit from REO, or a bulk sale.

	Non-Distress Sales	Early Foreclosures	Foreclosures	Bulk Sales	Sales <Assessed Value	Flips	Tax Delinquent
Vacancy Registration	0.001	−0.001	−0.007***	−0.004	−0.001	−0.002	−0.020*
	(0.007)	(0.000)	(0.002)	(0.003)	(0.001)	(0.001)	(0.008)
Inspection	0.013*	0.001	0.009***	0.004	−0.001	−0.000	0.003
	(0.006)	(0.000)	(0.003)	(0.004)	(0.001)	(0.001)	(0.010)
Inspection w/ Escrow	0.020***	0.001	0.005	0.006	−0.000	0.003	−0.008
	(0.005)	(0.000)	(0.003)	(0.005)	(0.001)	(0.002)	(0.009)
Vintage	−0.000	−0.000***	−0.000***	−0.000***	−0.000	−0.000*	−0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Square Feet	−0.000***	−0.000	−0.000***	−0.000***	0.000	−0.000	−0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Multifamily	−0.003	0.002*	0.011*	0.013	0.003	−0.004+	0.030
	(0.016)	(0.001)	(0.005)	(0.011)	(0.004)	(0.002)	(0.019)
% Black	−0.001***	0.000***	0.001***	0.000***	0.000	0.000**	0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
% Owner Occupied	0.000	0.000	0.000	−0.000	0.000	0.000	−0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Median Income	−0.001**	0.000	0.000**	0.000*	−0.000	−0.000	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
% No High school	−0.000	0.000	0.001*	0.000	0.000	−0.000	0.004***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
% College Grad	0.002***	−0.000**	−0.001***	−0.000	0.000	−0.000	−0.001*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Unemployment	−0.000	0.000	0.001	0.001	0.000+	0.001	0.011***
	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.002)
Median Home Price 2004	0.000	0.000	−0.000	−0.000	−0.000	0.000	−0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Property Tax Rate	2.322+	0.229**	0.695+	1.169+	0.038	0.484	2.504
	(1.198)	(0.088)	(0.420)	(0.649)	(0.150)	(0.321)	(1.627)
Constant	0.202	0.068***	0.744***	0.815***	0.024	0.200*	3.449***
	(0.279)	(0.015)	(0.094)	(0.160)	(0.046)	(0.090)	(0.302)
R^2	0.01	0.00	0.03	0.01	0.00	0.00	0.07

Table 6: Results - Matched Parcels. Outcomes are measured as counts in 2006, 2007 and 2008. N=205,886. Standard errors are clustered by census tract. Significance Key: *** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.1$. Data sources include the Cuyahoga County Fiscal Officer (property transactions and characteristics), Home Mortgage Disclosure Act (loan and borrower characteristics), and the American Community Survey (neighborhood characteristics).

Tables 7 and 8 display the estimates of alternate specifications of the sales models. We attempted the models separately for homes purchased in 2004-2005 with cash and those purchased with loans. The vacancy registration coefficients are somewhat larger in the cash sales models for foreclosures and sales below assessed value. Likewise the reduction of foreclosures due to vacancy registrations is concentrated in the outcomes of homes with below-median values. This is consistent with carrying costs discouraging foreclosures more when they are relatively large compared to the foreclosure recovery value. The positive association between point of sale inspections and foreclosure is stronger for loan sales and homes that sold above the median price. The elevated tax delinquency in cities with inspections is concentrated in the below-median value homes. There is one unfavorable result associated with the vacancy registrations. They are associated with a higher incidence of flipping for homes with below-median values in 2006 to 2008 (table 8). As with the foreclosures, when the carrying costs are a larger fraction of the property value, owners may seek to divest more quickly.

Specification		Early Foreclosure	Foreclosure	Sale Price <Assessed	Bulk	Flip	Tax Delinquent
Cash Sales	Vacancy Registration	−0.012 ∗ ∗	−0.055∗∗∗	−0.057 ∗ ∗	−0.001	−0.008	−0.015
N=7,218		(0.004)	(0.012)	(0.019)	(0.003)	(0.016)	(0.013)
	Inspection	−0.002	0.047∗∗∗	0.009	0.003	−0.030+	0.008
		(0.005)	(0.012)	(0.018)	(0.003)	(0.018)	(0.012)
	Inspection w/ Escrow	−0.007	0.017	0.004	0.001	−0.021	0.041 ∗ ∗
		(0.005)	(0.012)	(0.019)	(0.005)	(0.019)	(0.014)
	R²	0.03	0.03	0.11	0.01	0.07	0.11
Loan Sales	Vacancy Registration	0.002	−0.043∗∗∗	−0.038∗∗∗	−0.002+	−0.006	−0.016+
N=11,747		(0.003)	(0.012)	(0.011)	(0.001)	(0.006)	(0.009)
	Inspection	0.004+	0.062∗∗∗	0.008	−0.001	−0.010	0.025+
		(0.002)	(0.015)	(0.014)	(0.001)	(0.007)	(0.015)
	Inspection w/ Escrow	0.003	0.027+	−0.012	0.000	−0.019∗	0.028+
		(0.002)	(0.016)	(0.014)	(0.002)	(0.008)	(0.014)
	R²	0.01	0.05	0.03	0.00	0.01	0.02
Below Median Sales	Vacancy Registration	−0.000	−0.064∗∗∗	−0.009	0.001	0.003	0.001
N=9,484		(0.004)	(0.013)	(0.018)	(0.002)	(0.016)	(0.011)
	Inspection	−0.000	0.040∗	0.003	0.003	−0.040+	0.029∗
		(0.004)	(0.016)	(0.020)	(0.002)	(0.023)	(0.011)
	Inspection w/ Escrow	−0.001	0.040∗	0.032	0.004	−0.038+	0.079∗∗∗
		(0.005)	(0.016)	(0.023)	(0.003)	(0.022)	(0.010)
	R²	0.02	0.04	0.07	0.00	0.09	0.07
Above Median Sales	Vacancy Registration	0.002	−0.030∗	−0.026∗	−0.001	−0.016∗	−0.004
N=9,481		(0.002)	(0.013)	(0.013)	(0.002)	(0.007)	(0.010)
	Inspection	0.004	0.063∗∗∗	0.027∗	−0.000	−0.014+	0.021
		(0.002)	(0.018)	(0.013)	(0.003)	(0.008)	(0.016)
	Inspection w/ Escrow	0.004+	0.012	−0.008	−0.002	−0.018∗	0.002
		(0.002)	(0.016)	(0.013)	(0.003)	(0.009)	(0.016)
	R²	0.01	0.04	0.01	0.00	0.01	0.02

Table 7: Alternate specifications: results for the effect of ordinances on the next sale of homes sold in 2004 or 2005. Neighborhood characteristic regressors are included but not shown. Data sources include the Cuyahoga County Fiscal Officer (property transactions and characteristics), Home Mortgage Disclosure Act (loan and borrower characteristics), the American Community Survey (neighborhood characteristics) and the United States Postal Service (vacancy data).

Specification		Foreclosure 2006-2008	Sale <Assessed 2006-2008	Bulk 2006-2008	Flip 2006-2008	Delinquent 2006-2008
Cash Sales N=7,218	Vacancy Registration	−0.038***	−0.023	−0.003	0.005	0.004
		(0.011)	(0.016)	(0.004)	(0.012)	(0.033)
	Inspection	−0.007	0.003	0.001	−0.008	0.043
		(0.016)	(0.019)	(0.004)	(0.013)	(0.030)
	Inspection w/ Escrow	−0.013	−0.018	0.003	0.003	0.086*
		(0.014)	(0.019)	(0.006)	(0.014)	(0.033)
	R²	0.07	0.08	0.01	0.06	0.14
Loan Sales N=11,747	Vacancy Registration	−0.017*	−0.004	−0.002+	−0.007	−0.057**
		(0.008)	(0.009)	(0.001)	(0.006)	(0.021)
	Inspection	0.018+	0.002	−0.001	−0.001	0.068+
		(0.010)	(0.009)	(0.001)	(0.006)	(0.037)
	Inspection w/ Escrow	0.010	−0.004	−0.000	−0.013+	0.038
		(0.011)	(0.011)	(0.002)	(0.007)	(0.033)
	R²	0.05	0.02	0.00	0.01	0.05
Below Median Sales N=9,484	Vacancy Registration	−0.030*	0.017	−0.001	0.027**	0.013
		(0.015)	(0.012)	(0.003)	(0.009)	(0.023)
	Inspection	−0.015	0.007	−0.001	0.012	0.077**
		(0.024)	(0.015)	(0.004)	(0.011)	(0.026)
	Inspection w/ Escrow	−0.012	0.007	0.002	0.021+	0.099***
		(0.024)	(0.019)	(0.005)	(0.011)	(0.021)
	R²	0.08	0.08	0.01	0.07	0.16
Above Median Sales N=9,481	Vacancy Registration	0.006	0.013	−0.002	−0.009	0.017
		(0.007)	(0.010)	(0.002)	(0.007)	(0.020)
	Inspection	0.036***	0.017+	0.002	−0.012	0.072**
		(0.009)	(0.010)	(0.002)	(0.008)	(0.027)
	Inspection w/ Escrow	0.018*	0.003	0.002	−0.021*	0.032
		(0.008)	(0.011)	(0.003)	(0.009)	(0.029)
	R²	0.09	0.03	0.00	0.03	0.14

Table 8: Alternate specifications: results for the effect of ordinances on the future outcomes of properties that sold during 2004-2005. Regressors for neighborhood characteristics are included but not shown. Data sources include the Cuyahoga County Fiscal Officer (property transactions and characteristics), Home Mortgage Disclosure Act (loan and borrower characteristics), and the American Community Survey (neighborhood characteristics).

We attempted two additional alternate specifications which speak to the robustness of the main results. The outcome variables are dichotimous in some cases and take the form of low counts (1, 2, 3, etc.) in others. We attempted logistic and Poisson specifications in place of the linear models. The results were very similar and would support the same policy-relevant conclusions. One might also be concerned that there is a fundamental difference between a central city and any suburb, even if it is only in the perception of certain market participants. For example, some investors might perceive the central city as lacking the will or ability to enforce housing laws, and therefore they might attempt certain types of transactions in city neighborhoods that they would not attempt in any suburb. If this is the case, central-city parcels and sales should not be used in a comparison group for suburban treated properties. We ran our analysis after excluding all Cleveland observations, which constitute 31 percent of the matched sales and 24 percent of the matched parcels. The coefficient estimates change somewhat but the patterns of sign and significance remain. This gives us confidence that our results are not being driven by a city/suburb contrast.

6   Conclusions

As in most cities across the country, the cities in our study area all had to deal with distress in some fraction of their housing stock during the last decade. Above some threshold, housing problems destabilized neighborhoods. Our goal here was to assess whether, and to what extent, local ordinances protected neighborhoods from housing problems.

Vacancy registrations appear to have more desirable effects on neighborhood stability. Homes under these ordinances are significantly less likely to go through a foreclosure. We may be concerned that the vacancy registration lowers foreclosure by encouraging lenders to walk away from their collateral, rather than by maintaining neighborhood home values. However, if this were the case, we should see elevated tax delinquency among bank walk aways. In our results, the relationship between vacancy registrations and tax delinquency is

consistently negative and in some specifications, significantly so. This suggests the vacancy registration ordinances are not encouraging owners to abandon properties.

We do not find evidence that point-of-sale inspections, with or without escrow requirements, reduce foreclosures, bulk sales, or sales of homes below their assessed value. Instead, we find these inspections without escrow to be associated with higher levels of foreclosure, and an approximately 20 percent higher incidence of tax delinquency. Inspections with escrow requirements are also associated with higher tax delinquency.

Point-of-sale inspections may have a very long run benefit which is not detectable in a study such as this one that focuses on a crisis period. Our identification strategy requires that we match homes of similar value because home values summarize hundreds of unmeasured factors. It is possible that neighborhoods full of homes of similar vintage and quality have seen their values drift downward over the last couple decades, and therefore do not enter the comparison group for homes whose maintenance has been required by law. Additional research is needed to confirm or refute this hypothesis. In the meantime, municipalities will have to decide if some other justification, such as residents' safety, is sufficient for keeping or adding point-of-sale inspections. Vacancy registrations, although not without cost, do seem to lessen the incidence of foreclosure. Therefore they should be considered by cities that are concerned that a future housing crisis could destabilize their neighborhoods.

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