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**The Effect of Local Housing Ordinances  
on Neighborhood Stability**

by Thomas J. Fitzpatrick IV, Lisa Nelson,  
Francisca G.-C. Richter, and Stephan Whitaker



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The housing and economic crises have exerted a strong and lingering impact on housing markets across the nation. In this paper, we assess the degree to which local anti-blight policies have influenced housing market outcomes following the crises. The analysis is performed for cities in Cuyahoga County, Ohio. We measure outcomes that characterize market distress and that may be influenced by local housing ordinances including foreclosure, bulk sales, flipping, vacancy, and tax delinquency. Using matching procedures on linked data containing property, loan, and transaction characteristics, we compare outcomes across properties in regulated and unregulated municipalities. Point of sale inspections and vacancy registrations both decrease the probability that homes are flipped (resold within two years). We find that point of sale inspections are positively associated with foreclosures, property tax delinquency, and sales prices below the tax assessed value. The inspections may be revealing the need for expensive repairs in some homes, which could push borrowers underwater and into foreclosure. We find evidence that vacancy registration requirements do lower vacancy. The discussion around policies for housing market recovery, for the most part, has addressed efforts at the federal level. This analysis integrates in discussion of efforts and policies arising at the local level.

Key words: housing ordinances, neighborhood recovery, propensity score matching.

JEL codes: R52, R31, K30

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# 1 Introduction

Vacant, abandoned and blighted properties have been present for decades in the central cities and inner suburbs of all but the strongest regional housing markets. Faced with this problem, some municipalities passed housing ordinances to gather timely information about distressed properties or to force buyers and sellers to repair homes before they could be transferred. In the area covered in this study, Cuyahoga County, Ohio, some municipalities passed ordinances requiring vacant property registrations and point-of-sale inspections. In a few cases, the ordinances also required that an escrow account be established to cover critical repairs identified by the inspections. We estimate the impact these ordinances had on several measures of housing market stability.

The point-of-sale inspection ordinances were intended to generally maintain the quality of the housing stock. The vacancy registrations were meant to enable the cities to monitor vacancy and also to motivate owners to keep homes occupied. As the foreclosure crisis unfolded, these ordinances passed years earlier might have protected some municipalities from the worst types of neighborhood destabilization. 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. They sold these properties at steep discounts to speculators who quickly resold them to less sophisticated investors (C. Coulton and Hirsch, 2008). This “flipping” activity is usually accompanied by long periods of vacancy, and it allows the housing stock to deteriorate (Whitaker, 2011; Fitzpatrick IV and Whitaker, 2012). When the unsophisticated investors are surprised by the major repairs the homes need, they often dump the properties for less than their tax assessed value. In other cases, investors quit paying the property taxes and abandon the home. Where point-of-sale inspections are required, they should reveal severe maintenance problems to naive or out-of-town buyers. Vacancy registrations increase carrying costs and should discourage speculators who are not serious about quickly filling the home with a tenant.

These ordinances may have had unintended impacts on foreclosure activity. They may have discouraged banks from pursuing foreclosures because the lender would not have the opportunity to sell the home “as is.” On the other hand, forcing sellers to recognize a major home defect could push some sellers underwater and force them into foreclosure.

Foreclosures and the flipping by neglectful investors can have devastating effects on the property values of nearby homes (Whitaker and Fitzpatrick IV, 2011). Neighborhoods are destabilized when a vicious cycle of falling home values pushes homeowners underwater and into foreclosure. Also, vacant, abandoned and blighted properties can drive away current residents and potential buyers. Neighborhood stabilization policies aim to prevent or stop these trends, and the ordinances studied here fit this definition.

As municipalities across the country consider implementing similar ordinances, we want to know if they have been effective. Our research objective is to estimate the impact of the three types of ordinances - vacancy registrations, inspections, and inspections with escrow - on six measures related to housing market stability: foreclosure, bulk sales, flipping, selling below assessed value, tax delinquency and vacancy. We use sales records from Cuyahoga County, Ohio, covering 2004 to 2010. These are augmented with Home Mortgage Disclosure Act (HMDA) data, Census data, and US Postal Service (USPS) vacancy data. We match homes in cities that had ordinances in place with homes in cities that did not have ordinances before the foreclosure crisis. After controlling for a rich set of observables, we find that point-of-sale inspections are positively associated with foreclosures, and inspections and registries are negatively associated with flipping. We find some evidence that point-of-sale inspections increase sales below the assessed value and tax delinquency. The incidence of bulk sales shows no relationship to the ordinances.

The rest of the paper proceeds as follows. Section 2 describes the ordinances, as well as federal and state responses to the housing crisis. 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

The foreclosure crisis prompted responses at the federal level that focused initially on preventing foreclosure and keeping borrowers in their homes. As the housing downturn continued, federal programs have broadened to support recovery at various stages further along the pathway of housing distress. Specifically, the Making Home Affordable Program, which was instituted by the departments of the Treasury and Housing and Urban Development primarily as a loan modification program, now includes a Home Affordable Foreclosure Alternatives component that facilitates short sale or a Deed-in-Lieu of foreclosure. Additionally, the Federal Housing Finance Agency (FHFA) is piloting an REO-to-Rental program in some cities that have large stocks of Fannie Mae held REO properties and tightening rental markets. While the initial response focused on preventing foreclosures, programs have expanded to include expediting foreclosures when the borrower exits the house, which helps prevent blight that results from homes sitting vacant for extended periods of time.

At the state or local level, the response has been sometimes supported by and coordinated with federal programs, as in the case of Hardest Hit Funds that were administered by state housing finance agencies. But local policies are often implemented independently of federal policies, at a smaller scale, and with the intention of addressing the particular challenges of the region. Land banks and local housing ordinances are examples of such policies.

Recent years have seen the proliferation of local housing ordinances. Some of these are modeled on ordinances implemented during the 1980s and 1990s in weak markets experiencing a slow but steady deterioration in housing market conditions. Faced with decades of population loss and suburbanization, weak markets had been struggling with vacancy and abandonment long before the foreclosure crisis. Many cities already possessed well established housing ordinances that addressed vacancy. It is not surprising then that some of these

policies have been recently considered and implemented by other cities. Local officials either obtain better information about housing market distress, in hope that better information will lead to better solutions, or their policies directly address local housing market distress brought about by the current crisis. While it may still be too early to evaluate the effect of these recent local policies on housing market recovery, there is much to be learned by studying their performance in weak markets where they were in place before the foreclosure crisis.

In recent years, hundreds of local jurisdictions across the country have passed foreclosure and vacancy registration ordinances. Many of these were passed in response to banks beginning to rapidly sell low-value REO properties in 2007 and 2008. These sales were usually to dozens of separate investors, who bought batches of properties (Immergluck et al., 2012). Communities responded to this practice because of anecdotal reports of investors failing to upkeep the vacant properties. The homes were reportedly vacant for extended periods, in poor condition, and tax delinquent. Empirical analysis confirms these anecdotal reports. Over this period, corporate investors were far worse property tax avoiders than individuals, and their properties remained vacant at about twice the rate of those held by individuals (Ergungor and Fitzpatrick IV, 2011).

The most common ordinances require registration of foreclosed or vacant property or require pre-sale inspections and an escrow account. The escrow account must contain sufficient funds to make needed repairs before the home can be sold. Registered properties are subject to periodic inspections for code violations.<sup>1</sup> A point-of-sale inspection ordinance requires an inspection of the home before it can be sold. In all cases, the buyer receives the most recent inspection report when purchasing the home. While many buyers voluntarily pay for their own inspections, inspections are not normally required by law or by lenders. Lenders do require appraisals, but appraisers do not look for maintenance problems. Where escrow requirements are added to the ordinance, the lender or buyer is forced to establish an escrow

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<sup>1</sup>The foreclosure registry requirements in Cuyahoga County were implemented after the foreclosure crisis, so we can not evaluate them. We only attempt to evaluate the pre-crisis vacancy registration ordinances.

account containing all or a substantial portion of the funds necessary to bring a home up to code at the point of sale. These ordinances should provide an incentive for property owners to keep up with routine maintenance and property taxes, as these owners know that the municipality is keeping a close eye on their properties.

We expect these ordinances to discourage unhealthy housing market transactions, which often rely on being able to sell the home “as is” with code violations and/or property tax delinquency. Sometimes the buyers are not aware of the maintenance problems or delinquent taxes. Past research shows local land use laws have an impact on housing markets (Dumm et al., 2011; Speyrer, 1989; Glaeser and Gyourko, 2003). Although this research is primarily on land use restrictions, we would expect these ordinances to also have measurable effects. On the other hand, there is a general concern expressed by the lending and servicing community that these vacancy registrations and point-of-sale inspection ordinances, among others, will “create impediments to smooth foreclosures” (Pollard, 2012). The existence of ordinances may result in changes in foreclosure behavior.

While there is great uniformity among the general provisions of these ordinances, there are outliers worth discussing. For example, some vacancy registrations place a relatively high burden on the foreclosing lender. In September 2011, Springfield, Massachusetts, passed one such ordinance. While most of the ordinance is similar to others, one provision jumps out as out of the ordinary: a requirement that any non-exempted owner of vacant or foreclosed property post a \$10,000 cash bond for each foreclosed or vacant property owned by that person. Worcester, Massachusetts, passed a similar ordinance requiring a \$5,000 bond be posted (Pollard, 2012). Albany, New York has also followed Springfield’s lead and required a \$10,000 bond be posted. Unfortunately, we do not have any of these outliers in our sample, and are unable to evaluate them.

Another ordinance passed in Chicago, Illinois, takes a different, but still relatively extreme, approach. Rather than posting a bond for every vacant or foreclosed property owned, it broadens the definition of “owner” to include a mortgagee or the mortgagee’s agents and



assigns. This is problematic for lenders, because they are mortgagees, but that status alone does not give them the legal right to enter upon and alter the property. Provisions in most mortgage documents may give lenders the power to enter and secure properties, but this is largely untested in courts. The FHFA, overseer of Fannie Mae and Freddie Mac, has sued Chicago to enjoin enforcement of the ordinance against the government-sponsored enterprises.

It is commonly believed that preventing foreclosures will prevent blight, abandonment and excess market inventory from depressing home prices. 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. This could contribute to the stability of a neighborhood by decreasing foreclosures. However, borrowers who are in default due to financial hardship may stop maintaining their home or leave the home vacant if they expect a foreclosure to 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. So the overall effect on blight is unclear.

### **3 Theory and Methods**

Like in other old industrial cities, decades of population decline have generated a growing stock of vacant and abandoned properties in Cleveland and some 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 period:

2004-2005. We compare outcomes of sold homes in treated and untreated cities on several measures of housing distress: foreclosures, bulk sales, flips, sales below the assessed value, tax delinquency, and vacancy.

In the bullet points below, we summarize the possible relationships between the point-of-sale inspections (POSI) and vacancy registrations (VR) 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. 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.

- **Outcome: Foreclosure**

- POSI eliminate “surprise” repairs that cause financial hardship and default
- POSI 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
- POSI maintain neighborhood property values so distressed borrowers can sell their home to avoid foreclosure
- POSI discourage flip investors, which lowers banks’ expected recovery value and encourages loan modifications or bank walk-aways
- + POSI may identify costly repairs that push homeowners underwater and force them into foreclosure<sup>2</sup>

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<sup>2</sup>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.

- **Outcomes: Bulk Sales and Flipping**

- POSI increase transaction costs, which discourage flipping; reduced opportunity to flip discourages bulk buying
- POSI decrease information asymmetries and alert naive investors if homes are low-quality
- POSI maintain neighborhood property values, which makes homes too expensive for amateur cash investors
- POSI may reduce foreclosures, reducing the REO inventory that can enter a flipping cycle
- + POSI may increase foreclosures, increasing the REO inventory that can enter a flipping cycle

- **Outcome: Selling below assessed value**

- POSI maintain the condition of the neighborhood's housing stock by forcing repairs at the time of sale
- POSI motivate owners to fix problems early and avoid more costly repairs at the time of sale; Better maintained homes retain their value
- + POSI 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

- **Outcome: Tax delinquency**

- POSI maintain neighborhood property values and discourages owner or bank walk-aways
- + POSI discourage flip investors, which lowers banks' expected recovery value and encourages walk-aways

- **Outcome: Vacancy**

- POSI maintain neighborhood property values and make the area desirable for buyers and renters

- **Outcome: Foreclosure**

- VR maintain neighborhood property values so distressed borrowers can sell their home to avoid foreclosure
- VR discourage flip investors, which lowers banks' expected recovery value and encourages loan modifications or bank walk-aways

- **Outcomes: Bulk Sales and Flipping**

- VR increase carrying costs, which decreases the profitability of buying homes in bulk and flipping them

- **Selling below assessed value**

- VR maintain neighborhood property values and keeps sale prices above the assessed values
- + VR fees, like property taxes, are capitalized into home prices; Investors must plan to pay these when they have periods of vacancy between tenants
- + VR increase carrying cost, which encourages sellers to reduce their time on market by lowering prices

- **Outcome: Tax delinquency**

- VR maintain property values, which discourages owner and bank walk-aways
- + VR increases carrying costs, which encourages owner and bank walk-aways

- **Outcome: Vacancy**

- VR increase the price of vacancy, motivating people to avoid it by lowering asking prices or rent; VR fees encourage quickly transferring property to an owner that can fill the unit with an occupant

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 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-2005. 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 who enacted ordinances after 2008.

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.

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 interested in estimating the mean difference in outcomes due to the ordinance, the treatment effect on the treated (TT):  $E(Y_1 - Y_0|T = 1)$ . We do not observe realizations for the counterfactual  $Y_0|T = 1$ , which is the outcome for a property in an ordinance city, had it not been subject to the ordinance. Instead, we observe realizations of  $Y_0|T = 0$ . Strong ignorability implies that the control variables are rich enough to eliminate the bias originated when using parameters of the observed variable  $Y_0|T = 0$  to proxy for the unobserved  $Y_0|T = 1$ . Formally,  $E(Y_0|T = 1, X) - E(Y_0|T = 0, X) = 0$ . Aware that this is a very strong assumption, we are careful to build a rich set of variables into

$X$  and to 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  $X$  variables and the treated status. These weights should create a close alignment of the distributions of the observables in the treated and untreated samples.

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  $P(T = 1/X)$ , 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  $P(T = 1/X)$  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.

For transactions taking place in the 2004-2005 period, the data is blocked by property type (one or more units), occupancy type, 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, and percent of non-depository loan originations in 2004. Stata's *psmatch2* is used to implement the

procedure (Leuven and Sianesi, 2003).

## 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.<sup>3</sup> HMDA contains loan level data on loan characteristics such as lending 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. Table 1 lists the variables from each of these data sets that are used in the linking and matching procedures.

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.<sup>4</sup> 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.

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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<sup>3</sup>Census tract level variables were extracted from the NEO CANDO database at the Center on Urban Poverty and Community Development at Case Western Reserve University.

<sup>4</sup>The *Link Plus* software is provided free of charge by the National Program of Cancer Registries Division of the Centers for Disease Control and Prevention. It is based on the method developed by Fell and Sunter (1969)

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 (erly-forc): if the house went into tax or mortgage foreclosure and was sold at sheriff's sale within the first two years after the first sale.
- Foreclosure (forc): 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.
- Bulk (bulk): 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 (flip): if the house was re-sold within the first two years after the first sale (not including sales out of REO).
- Below Assessed Value (belowv): if the next sale price was below the most recent assessed value in the property tax records. Tax-assessed values in Cuyahoga County are below market values.
- Current to Delinquent (cur-to-del): if the house was tax current before the first sale and becomes tax delinquent before it resells.
- Vacancy (vac): this measure is the count of months in which the home was vacant between April 2010 and May 2012.<sup>5</sup>

We are also interested in seeing whether there is a difference in the long term outcomes of these properties due to the ordinances. The following variables reflect measures equivalent

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<sup>5</sup>Vacancy is determined by USPS mail carriers who visit the residences daily. They update the master USPS address database so that mail addressed to vacant properties is not dumped at the residence. The USPS makes the vacancy data available to bulk mailers so that they do not print and address mailings that are undeliverable. We have subscribed to the vacancy data, via the USPS's contract partner, since April 2010. We run our list of Cuyahoga County addresses through the software and create a panel of vacancy observations. The data does not capture short-term vacancies of less than 90 days.



to those above. Rather than indicators reflecting the next sale, these variables are counts summed from 2006 through 2008. The counts measure the number of times the property sold at sheriff's sale (forc0608), sold within two years of the previous sale (flp0608), sold below its assessed value (belowv0608), or was tax delinquent (del0608).

Summary statistics of the linked and matched data are presented in table 3. Properties sold in the 2004-2005 period in ordinance cities are located in neighborhoods that have higher owner-occupancy and educational levels on average, but somewhat lower housing values than their non-ordinance counterparts. Of course, there is much more variation of house prices in the larger, untreated group. After matching by property and including all subsequent sales, we end up with about 10,000 sales in the matched treated group out of 12,000 sales in the linked treated data set. After matching by the propensity score, treated and untreated groups are closer in characteristics such as owner occupancy and neighborhood educational level. Their sale prices are only slightly closer than before the matching. Figure 2 shows the distribution of propensity scores for mortgage and cash transactions. While the propensity score distributions are similar across treated and untreated parcels, this is less the case for the distribution of sale prices as can be seen in figure 3. Thus, even after matching we include the sales price in all regressions as a control variable.

## 5 Results

Table 4 displays results for a series of regressions on the outcomes of interest related to the subsequent sale (short term). Table 5 presents results for the longer term outcome measures. The point-of-sale inspection indicator has a significant, positive coefficient that suggests that treated homes' probability of going into foreclosure is 3 percentage points higher than that of untreated homes. When the marginally significant coefficient on the escrow indicator is combined with the POS coefficient, it suggests homes with POS and escrow treatments are more likely than untreated homes to go into foreclosure by 1.3 percentage points. The POS

ordinance is also associated with over 2 percentage points of elevated low-priced sales and tax delinquency. The ordinances appear to have one desirable impact via their suppression of flipping. Relative to untreated homes, the flipping incidence among POS-treated homes is 4.1 percentage points lower and 5.6 percent points lower if escrow requirements are in place. A vacancy registration ordinance reduces the time in vacancy, as well as flipping and foreclosures in the short term, but has little or no effect on other measures of housing distress. As expected, properties purchased with high cost loans tend to have higher chances of becoming delinquent and ending up in foreclosure. This is also the case for the longer term outcome regression estimates in table 5 . Here, cash transaction and lower sales prices also tend to lead to worse outcomes.

Tables 6 and 7 display the estimates of seven alternate specifications of the models. For the first set of models, we create a single indicator that equals one if the city passed any law, and zero otherwise. Combining the positive and negative coefficients in the foreclosure estimate washes the total effect out for the next-sale estimates (table 6). Having any ordinance makes it much less likely (-.053) that the next sale is a flip. The next three rows of the tables contain estimates with indicators of only one type of ordinance in the model. Using this specification combines the observations with no treatment and those with the other treatments into the reference category. Most of the estimates are unchanged, except where the escrow indicator proxies for the point-of-sale requirement (because all cities with escrow requirements also require point-of-sale inspections). In the vacancy models (table 7, column 1, rows 2-4), it appears that as the control group changes the treated sales are no longer significantly different from the control group.

We attempted the models separately for homes purchased in 2004-2005 with cash and those purchased with loans. The positive correlation between point-of-sale inspections and foreclosures is somewhat stronger for loan-purchased homes, although it is still positive and significant for cash-purchased homes. This is in keeping with the logic that inspections identify costly repairs that can push borrowers underwater. Vacancy registrations are negatively

correlated with foreclosure, and the effect is stronger for cash-purchased homes. The deterrent effect of ordinance on the quick resale (flip) of the house seems to be stronger for loan-purchased homes. In table 7, we can see that the ordinances generally have more impact on cash sales. One exception is that point-of-sale inspections are more strongly associated with becoming tax delinquent for loan-purchase homes.

One remaining question is whether the cash/loan differences are just proxying for the lower price distribution of the cash-purchased homes, or whether the ordinance were more effective at protecting low-priced neighborhoods. We limited the sample to homes that sold below the median price. The negative relationship between vacancy registrations and foreclosure is stronger. This could reflect that registration-related costs will be a higher percentage of the value of low-cost homes, which discourages lenders from foreclosing. Also, the pooled estimates detected no relationship between escrow requirements and vacancy registrations and sales below the tax assessed value. Lower-priced homes, however, are significantly more likely to resell for less than their assessed value in cities with ordinances. This is not supportive of the argument that ordinances can help protect the tax base. For the long-run outcome measures, almost all the significant coefficients from the pooled model increase in magnitude when the sample is limited to low-priced properties.

## 6 Conclusions

We evaluate the impact that local anti-vacancy and anti-blight ordinances may have had on local housing markets during the period following the housing price peak in Cuyahoga County, Ohio. Properties under a point-of-sale inspection law are more likely to become foreclosed than those without the ordinance. Although properties under point-of-sale requirements have worse housing markets outcomes than those without them, the addition of a requirement to escrow sufficient funds to repair the property at the point of sale seems to counteract some negative impacts. Ordinances do seem to reduce the number of flips (sales

within 2 years of a former sale). Extending the comparison of housing outcomes up to eight years after properties were matched, the effect of the ordinances continues to be mixed. The only desirable long-term outcome appears to be that vacancy registrations reduce vacancy. While ordinances may enhance information for prospective home buyers and city administrators during times of housing market stability, we do not find evidence that they prevented housing distress during the recent crisis.

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Source	HMDA	Recorder	Auditor	Census 2000
Coverage	mortgages of reporting lenders	all mortgages recorded	mortgage and cash sales	
Linking variables	lender loan amount origination date tract	lender loan amount deed recording date tract parcel	lender sale price sale date tract parcel	
Matching variables				
Sale variables	loan type borrower income			
Property variables		deed type vintage sq. footage occupancy # units		
Tract variables				% owner-occupancy % black households % non-high school grads % college grads median income % unemployment
	% high cost loans 2004		median home price 2004	

Table 1: Linking and matching variables from the Home Mortgage Disclosure Act Data Set (HMDA), Cuyahoga County Recorder and Auditor Data Sets, and Census.

Variable	Mean	Std. Dev.
<b>Outcomes</b>		
Early foreclosure	0.015	0.122
Foreclosure	0.111	0.314
Bulk sale	0.005	0.070
Flip sale	0.079	0.269
Sale below assessed value	0.146	0.353
Tax current-to-delinquent	0.121	0.326
Months vacant	2.170	6.292
Foreclosures 06-08	0.021	0.144
Flips 06-08	0.064	0.253
Sales below assessed value 06-08	0.177	0.453
Tax delinquent in 06, 07 or 08	0.366	0.773
<b>Ordinance treatments</b>		
Point of Sale	0.380	0.485
Escrow	0.186	0.389
Vacancy Registration	0.174	0.379
<b>Control variables</b>		
FHA VA Loan	0.065	0.247
Rental Mortgage	0.069	0.254
High Cost Loan	0.143	0.350
Cash (no loan data)	0.390	0.488
Vintage	1945.373	32.950
Square Feet	2003.877	67169.740
Multifamily	0.077	0.267
% Black households	23.139	33.911
% Owner occupied	72.872	18.956
Median income (thousands)	45.383	16.692
% Non-high school grads	15.632	8.601
% College grads	25.461	17.156
% Unemployed	5.187	3.874
Median home price 2004	130.449	60.558
Sale price	130.622	71.527
Initial sale in 2005	0.497	0.500

Table 2: Descriptive statistics of linked and matched data. Means and standard deviations are calculated using the frequency weights assigned by the matching procedure. The same weights are applied in all regressions. The data sources are the Home Mortgage Disclosure Act Data Set (HMDA), the Cuyahoga County Recorder and Auditor Data Sets, and Census data.

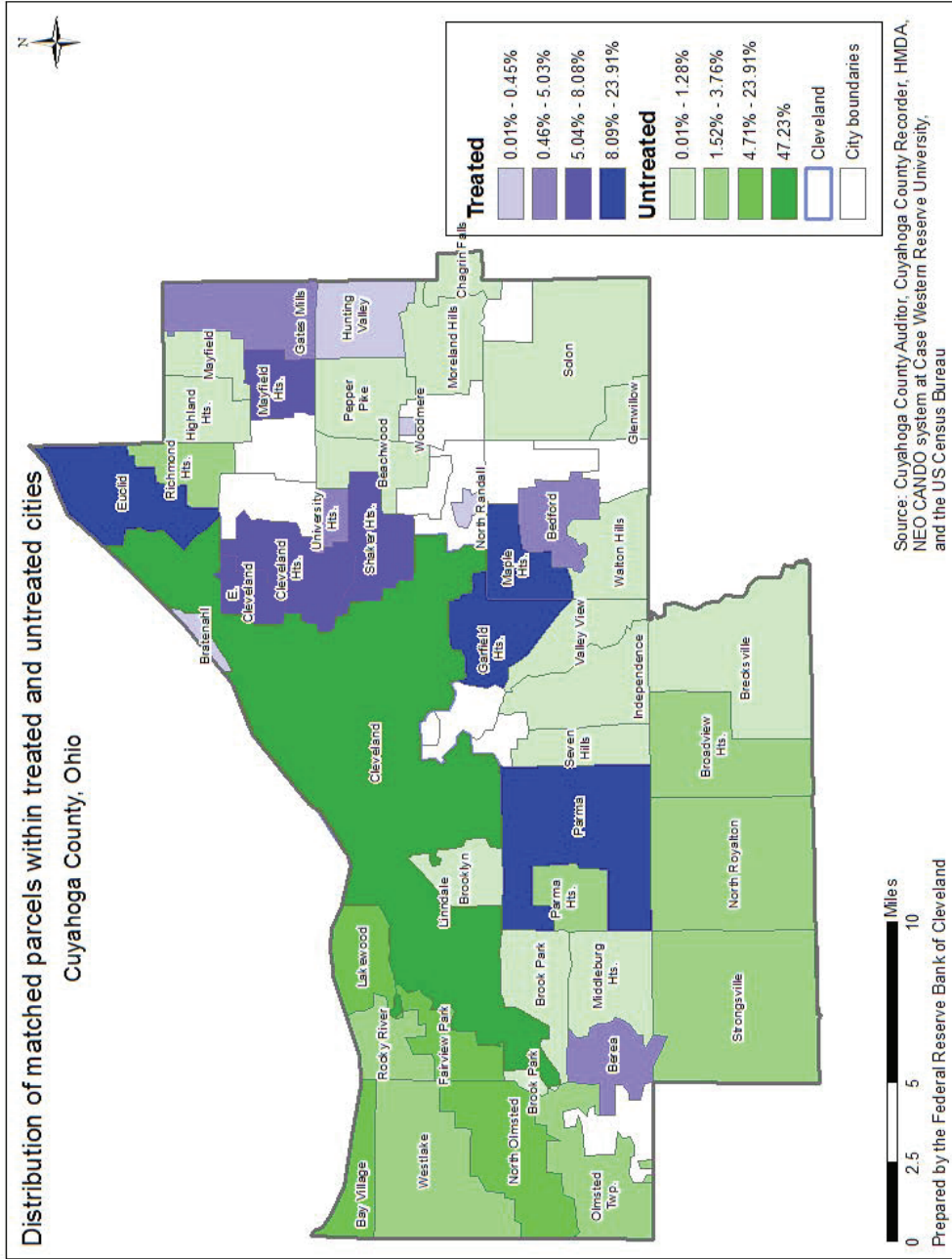


Figure 1: Map of Cuyahoga County. Municipality's colors indicate their share of the treated and untreated samples.



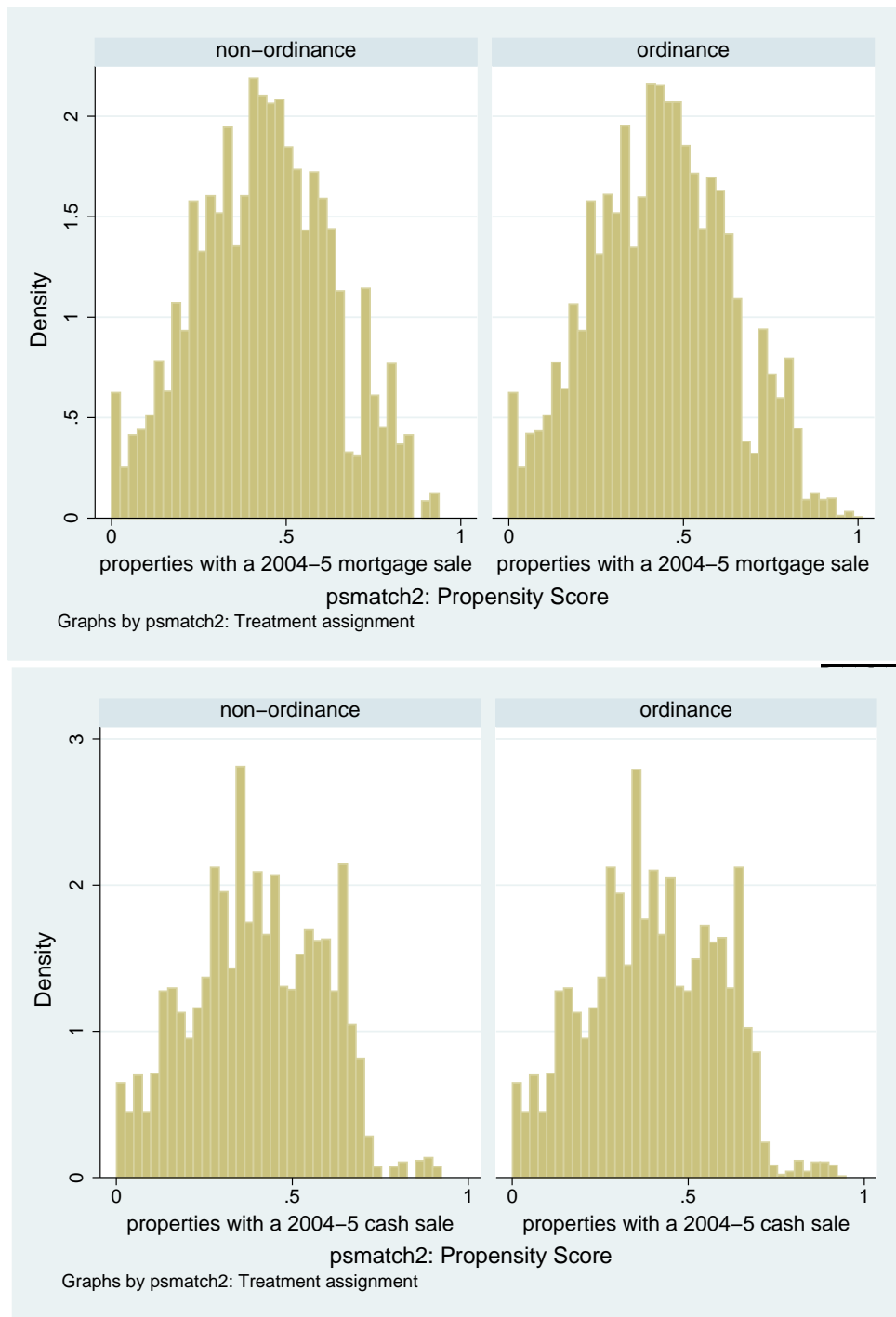
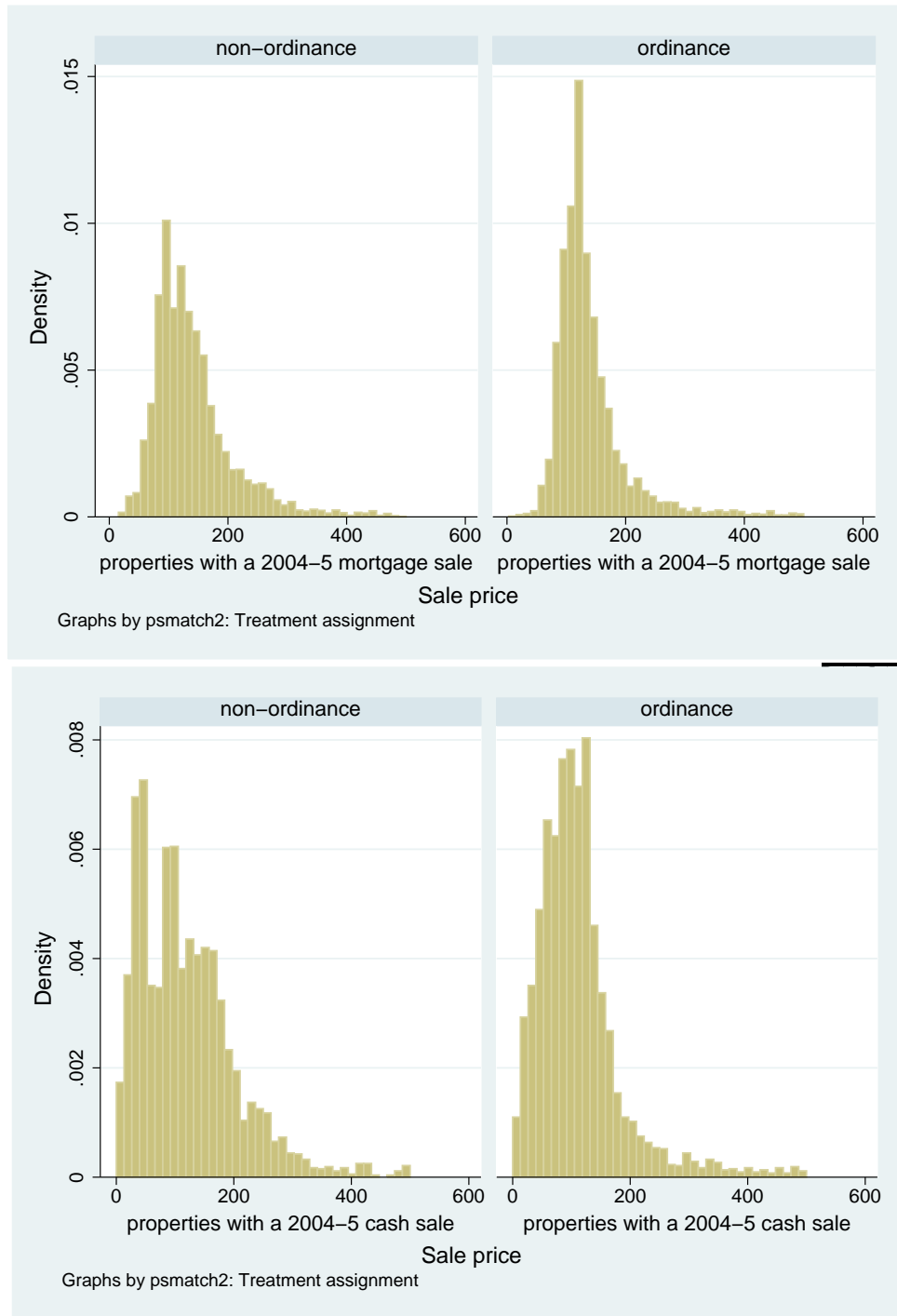


Figure 2: Distribution of propensity score for properties not subject and subject to ordinances



**STATA**

Figure 3: Distribution of 2004-2005 sale prices for properties not subject and subject to ordinances

All linked data	Subject to ordinances		Not subject to ordinances	
	mean	sd	mean	sd
% owner occupied housing units in neigh.	72.77	18.38	65.13	21.66
% with high school degree in neigh.	85.04	7.34	79.39	13.48
Median sales price in tract, 2004	130.39	59.65	136.11	84.50
% non-depository lending	40.61	15.04	41.51	22.69
Cash transactions 2004-2005	0.39	0.49	0.43	0.50
Sale price (thousands)	127.83	67.55	133.15	94.91
	N = 12,001		N = 31,065	
Matched data	Subject to ordinances		Not subject to ordinances	
	mean	sd	mean	sd
% owner occupied housing units in neigh.	72.82	18.67	72.93	19.24
% with high school degree in neigh.	84.05	7.16	84.69	9.83
Median sales price in neigh., 2004	127.38	58.47	133.52	62.43
% non-depository lending	40.38	15.31	39.23	19.53
Cash transactions 2004-2005	0.39	0.49	0.39	0.49
Sale price	128.73	67.99	132.52	74.85
	N = 10,112		N = 10,112	

Table 3: Summary statistics for properties that sold in 2004-2005. Statistics are given first for all linked data and then for the subset of properties that are matched.

	erly-forc	forc	bulk	flip	belowv	cur-to-del
Point of Sale	0.003 (0.003)	0.030*** (0.008)	0.002 (0.002)	-0.041*** (0.007)	0.022* (0.010)	0.023* (0.009)
Escrow	-0.008* (0.004)	-0.017+ (0.009)	-0.002 (0.003)	-0.015+ (0.008)	-0.006 (0.011)	0.003 (0.010)
Vacancy Registration	-0.003 (0.003)	-0.018* (0.007)	-0.001 (0.002)	-0.026*** (0.007)	-0.004 (0.009)	-0.010 (0.008)
FHA VA Loan	-0.005*** (0.001)	0.022* (0.010)	0.001 (0.002)	-0.012 (0.011)	-0.054*** (0.006)	-0.043*** (0.005)
Rental Mortgage	0.009 (0.006)	0.012 (0.014)	0.004+ (0.002)	0.021 (0.014)	0.042 * * (0.016)	-0.007 (0.018)
High Cost Loan	0.019*** (0.005)	0.225*** (0.015)	0.001 (0.001)	0.025+ (0.013)	-0.023 (0.019)	0.190*** (0.018)
Cash (no loan data)	0.013*** (0.002)	-0.001 (0.007)	0.007*** (0.001)	-0.017 * * (0.006)	0.207*** (0.009)	0.096*** (0.006)
Vintage	-0.000+ (0.000)	-0.000* (0.000)	0.000 (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	0.004 (0.006)	0.034* (0.013)	-0.002 (0.003)	-0.009 (0.016)	0.006 (0.015)	0.043 * * (0.016)
Sale price	-0.000* (0.000)	0.000* (0.000)	-0.000 * * (0.000)	0.000* (0.000)	-0.002*** (0.000)	-0.000*** (0.000)
2005	0.014*** (0.003)	-0.013* (0.006)	-0.001 (0.001)	-0.045*** (0.005)	0.037*** (0.007)	0.024*** (0.006)
Constant	0.112* (0.055)	0.637* (0.279)	0.705* (0.067)	-0.078 (0.349)	0.355+ (0.189)	0.621* (0.303)
N	20,140	20,140	20,140	20,140	20,140	20,140
R <sup>2</sup>	0.03	0.10	0.04	0.01	0.25	0.14

Table 4: Regression 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. Dependent variables are that the property becomes foreclosed within two years after sale (erly-forc) or anytime before the next sale (fore); that it sells within the next two years (flip); that the next sale price was below the most recent assessed value (belowv) or part of a bulk sale (bulk), and that it becomes tax delinquent before the next transaction (cur-to-del).

	vac	forcl0608	flp0608	belowv0608	del0608
Point of Sale	0.833 * *	0.007+	0.003	0.030*	0.069 * *
	(0.295)	(0.004)	(0.006)	(0.013)	(0.021)
Escrow	-1.079 * *	-0.001	-0.004	-0.013	-0.039+
	(0.333)	(0.005)	(0.007)	(0.015)	(0.023)
Vacancy Registration	-0.344*	0.006+	0.004	-0.011	-0.004
	(0.160)	(0.003)	(0.006)	(0.009)	(0.016)
FHA VA Loan	0.245	-0.005+	-0.016***	-0.047***	-0.093***
	(0.184)	(0.002)	(0.004)	(0.008)	(0.015)
Rental Mortgage	1.502***	0.021+	0.042***	0.042*	0.072+
	(0.317)	(0.011)	(0.011)	(0.021)	(0.040)
High Cost Loan	1.452***	0.004	0.011	0.216***	0.568***
	(0.234)	(0.005)	(0.007)	(0.019)	(0.036)
Cash (no loan data)	1.145***	0.022***	0.071***	0.113***	0.290***
	(0.134)	(0.002)	(0.005)	(0.009)	(0.017)
Vintage	-0.012*	-0.000	0.000	-0.000*	-0.001*
	(0.005)	(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	-0.551	0.008	0.003	0.051*	0.071*
	(0.398)	(0.009)	(0.013)	(0.020)	(0.035)
Constant	21.836*	0.075	-0.102	0.797*	1.793*
	(9.547)	(0.076)	(0.123)	(0.368)	(0.792)
N	20,223	20,223	20,223	20,223	20,223
R <sup>2</sup>	0.15	0.03	0.05	0.12	0.22

Table 5: Regression 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. Dependent variables are the incidence of the following measures during 2006, 2007 and 2008: the property sold was foreclosed upon (forcl0608), the property was resold within two years (flp0608), the property sold below its assessed value (belowv0608), the property was tax delinquent (del0608). The vac measure is number of months the property was vacant during the period April 2010 - May 2012, for which vacancy data is available.

	erly-forc	forc	bulk	flip	belowv	cur-to-del
Any Ordinance	-0.002 (0.003)	0.009 (0.006)	-0.001 (0.001)	-0.053*** (0.006)	0.015+ (0.008)	0.016* (0.007)
$R^2$	0.03	0.10	0.01	0.04	0.25	0.14
Point of Sale	-0.001 (0.003)	0.022*** (0.006)	0.001 (0.002)	-0.049*** (0.006)	0.019* (0.008)	0.024*** (0.007)
Escrow	-0.005+ (0.003)	0.009 (0.007)	-0.000 (0.002)	-0.047*** (0.008)	0.012 (0.010)	0.022 * * (0.007)
Vacancy Registration	-0.002 (0.003)	-0.016+ (0.008)	-0.001 (0.002)	-0.028*** (0.007)	-0.002 (0.009)	-0.009 (0.008)
Cash Sales (N=7,825)						
Point of Sale	0.004 (0.005)	0.028 * * (0.009)	0.004 (0.005)	-0.020* (0.009)	0.040* (0.016)	0.025+ (0.013)
Escrow	-0.011+ (0.006)	-0.009 (0.011)	-0.006 (0.006)	-0.019* (0.009)	0.006 (0.019)	0.007 (0.016)
Vacancy Registration	-0.009+ (0.005)	-0.033*** (0.009)	0.001 (0.006)	-0.025*** (0.007)	0.012 (0.015)	-0.014 (0.013)
$R^2$	0.03	0.03	0.01	0.03	0.26	0.13
Loan Sales (N=12,315)						
Point of Sale	0.003 (0.003)	0.046*** (0.012)	-0.000 (0.001)	-0.052*** (0.010)	-0.006 (0.008)	0.022+ (0.011)
Escrow	-0.006+ (0.004)	-0.027+ (0.016)	0.001 (0.002)	-0.015 (0.012)	0.001 (0.008)	0.007 (0.013)
Vacancy Registration	-0.000 (0.004)	-0.019+ (0.011)	-0.002* (0.001)	-0.029 * * (0.010)	-0.017* (0.009)	-0.019+ (0.011)
$R^2$	0.02	0.07	0.00	0.05	0.03	0.05
Below Median Sales (N=9,998)						
Point of Sale	0.005 (0.005)	0.027* (0.011)	0.003 (0.003)	-0.035*** (0.008)	0.035+ (0.018)	0.036* (0.014)
Escrow	-0.012* (0.006)	-0.024 (0.015)	-0.005 (0.004)	-0.020+ (0.011)	0.058* (0.024)	0.033* (0.016)
Vacancy Registration	-0.003 (0.005)	-0.063*** (0.013)	-0.001 (0.004)	-0.035*** (0.010)	0.078 * * (0.024)	-0.013 (0.020)
$R^2$	0.04	0.05	0.01	0.08	0.29	0.10

Table 6: 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. Dependent variables are that the property becomes foreclosed within two years after sale (erly-forc) or anytime before the next sale (fore); that it sells within the next two years (flip); that the next sale price was below the most recent assessed value (belowv) or part of a bulk sale (bulk), and that it becomes tax delinquent before the next transaction (cur-to-del).

	vac	forcl0608	flp0608	belowv0608	del0608
Any Ordinance	0.230 (0.208)	0.007* (0.003)	0.001 (0.005)	0.018+ (0.010)	0.037* (0.015)
$R^2$	0.15	0.03	0.05	0.12	0.22
Point of Sale	0.329 (0.231)	0.007* (0.003)	0.002 (0.005)	0.023* (0.011)	0.051 * * (0.016)
Escrow	-0.379 (0.267)	0.005 (0.004)	-0.001 (0.006)	0.012 (0.012)	0.017 (0.017)
Vacancy Registration	-0.230 (0.144)	0.006+ (0.003)	0.004 (0.006)	-0.009 (0.009)	0.003 (0.016)
Cash Sales (N=7,888)					
Point of Sale	1.014* (0.397)	0.011+ (0.007)	-0.006 (0.011)	0.052* (0.020)	0.059+ (0.031)
Escrow	-1.559*** (0.433)	0.006 (0.008)	0.003 (0.014)	-0.008 (0.023)	-0.009 (0.037)
Vacancy Registration	-0.724 * * (0.241)	0.011+ (0.006)	0.007 (0.012)	-0.033* (0.014)	0.012 (0.031)
$R^2$	0.18	0.04	0.07	0.12	0.20
Loan Sales (N=12,335)					
Point of Sale	0.770 * * (0.272)	0.004 (0.003)	0.006 (0.005)	0.020 (0.015)	0.082 * * (0.027)
Escrow	-0.745* (0.335)	-0.003 (0.005)	-0.005 (0.007)	-0.012 (0.018)	-0.040 (0.034)
Vacancy Registration	-0.289+ (0.160)	0.002 (0.004)	-0.000 (0.006)	-0.012 (0.012)	-0.045* (0.021)
$R^2$	0.10	0.01	0.00	0.06	0.10
Below Median Sales (N=10,062)					
Point of Sale	1.350*** (0.375)	0.010+ (0.005)	0.005 (0.009)	0.044* (0.018)	0.085 * * (0.029)
Escrow	-1.126* (0.466)	0.007 (0.007)	0.012 (0.010)	0.009 (0.020)	0.010 (0.032)
Vacancy Registration	-0.281 (0.315)	0.014* (0.006)	0.021* (0.010)	-0.015 (0.017)	0.004 (0.031)
$R^2$	0.15	0.03	0.07	0.10	0.21

Table 7: 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. Dependent variables are the incidence of the following measures during 2006, 2007 and 2008: the property sold was foreclosed upon (forcl0608), the property was resold within two years (flp0608), the property sold below its assessed value (belowv0608), the property was tax delinquent (del0608). The vac measure is number of months the property was vacant during the period April 2010 - May 2012, for which vacancy data is available.