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The Effect of Foreclosures on Nearby Housing Prices: Supply or Disamenity?

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The Effect of Foreclosures on Nearby Housing Prices: Supply or Disamenity?

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Several studies have measured negative price effects of foreclosed residential properties on nearby property sales. However, these studies do not address which mechanism is responsible for these effects. I measure separate effects for different types of foreclosed properties and use these estimates to decompose the effects of foreclosures on nearby home prices into a component that is due to additional available housing supply and a component that is due to disamenity stemming from deferred maintenance or vacancy. I estimate that each extra unit of supply decreases prices within 250 feet by about 1.6% in low-vacancy-rate census tracts while the disamenity stemming from a foreclosed property is near zero. In high-vacancy-rate census tracts the story is reversed: each extra unit of foreclosure is associated with a disamenity effect of about -2% within 250 feet but no supply effect.

Key words: foreclosure, housing prices, neighborhood effects.

JEL codes: H23, R20, R30.

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1 Introduction

As housing prices have fallen and foreclosure rates have risen over the past few years, lenders have been put in the position of having to liquidate ever larger inventories of foreclosed homes. Recently, a number of articles in the popular press have cited a "shadow inventory" of homes, part of which is made up of homes that have been repossessed by lenders but have not been listed for sale. In a July 7, 2009 segment on National Public Radio, Yuki Noguchi reports,

> "I do know that banks are holding onto inventory, and what they're doing is they're metering them out at an appropriate level to what the market will bear," says Pat Lashinsky, chief executive of online brokerage site ZipRealty.[1]

This strategy may have implications for the property values of homes that are near the bank-owned properties. As an owner of a nearby property or as a local public official concerned about tax revenue from properties near foreclosed homes would one rather have the bank "meter out" the properties to meet demand or sell them quickly to minimize the time that they sit vacant?

The answer to this questions hinges upon the mechanisms through which foreclosures decrease nearby property values and the relative size of each effect. There are two primary mechanisms which are theoretically plausible ways by which a foreclosure may lower the value of other properties nearby. The first mechanism is by way of increasing the supply of homes on the market.[2] The second mechanism operates through the dis-amenity imposed on nearby properties if a foreclosed property is not properly maintained or if it falls victim to crime or vandalism, possibly while vacant.[3] This paper attempts to measure the effect of foreclosure on nearby property values and to decompose this effect into portions attributable to the aforementioned supply and dis-amenity mechanisms.

I pursue an empirical strategy under which identification of separate supply and dis-amenity effects depends upon the degree of segmentation between the single-family and multi-family housing markets. Specifically, I consider two cases: segmentation and integration. In the segmentation case, I assume that foreclosure of a nearby single-family home

[1] The full segment can be found at `http://www.npr.org/templates/story/story.php?storyId=106113137`.
[2] Wheaton [1990] shows that prices fall as vacancies rise in a housing market search and matching model.
[3] Immergluck and Smith [2006b] investigate the connection between foreclosures and crime. See also Apgar et al. [2005].

affects the property values of single-family homes through both the supply and dis-amenity mechanisms. This is because foreclosure of a single-family home adds a unit of supply to the single-family market and creates the potential for a poorly maintained or vacant property. However, foreclosure of a nearby renter-occupied multi-family building affects the property values of single-family homes only through the dis-amenity mechanism. This is because, in the segmentation case, potential buyers of single-family homes do not view multi-family buildings as substitutes; so no supply is added to the single-family home market. In this case, renter-occupied multi-family building foreclosures may still affect single-family home prices but only through potential lack of up-keep and vacancy. In the integration case, the foreclosure of a nearby multi-family building will also affect property values of single-family homes through the supply mechanism. Under either assumption, identification of separate supply and dis-amenity effects hinges upon estimation of both the effect of single-family home foreclosures and the effect of renter-occupied multi-family building foreclosures on nearby single-family home prices.

I estimate the effects of single-family home and renter-occupied multi-family foreclosures on the universe of single-family home sales in Chicago between 1998 and 2008. Using a hedonic framework, I estimate the effect of single-family and multi-family foreclosures that occurred during the prior year on the log price of single-family homes within 500 feet. In addition to the universe of other residential foreclosures, I control for a large number of property characteristics that could affect home prices. I also include census tract effects to control for persistent neighborhood differences across the city. A central concern of all studies that examine the effect of foreclosures on property values is that they may be affected by reverse causality. The issue is that falling property values may provide an impetus for home-owners to default on their mortgages; thus, foreclosures could be concentrated precisely in the places prices have fallen the most, yet the lower prices would not have been caused by the foreclosures. If prices fall at different rates in different neighborhoods, then the inclusion of community area-by-year effects may be necessary to avoid bias due to reverse causality. In my preferred specification, I control for trends in housing prices over the sample period using a community area-by-year price index to control for neighborhood-level price trends and census tract effects to control for persistent price differences at a finer geographical level.

I find that each foreclosure filing occurring in the previous year and within a 250 foot radius is associated with a reduction in the price of a single-family home of about 1.4%, and each foreclosure auction occurring in the previous year is associated with a reduction in the price of a single-family home of about 1.6%. While comparing these estimates may contain some information regarding the relative magnitudes of the supply and dis-amenity effects, it is not easy to interpret because the data that I am using do not allow me to determine what is happening to the property between the filing and the auction. I also cannot tell whether properties for which foreclosure filings do not result in auctions end up being sold prior to auction, end up with the delinquency being cured, or end up sitting vacant.

Instead, I focus on comparing the effects of single-family foreclosures and multi-family renter-occupied foreclosures on nearby property values. I find that each single-family home foreclosure filing within a 250 foot radius occurring in the past year is associated with a reduction in the price of a single-family home of about 1.6%.[4] Multi-family foreclosure auctions in the past year within a 250 foot radius are not associated with a reduction in the price of a single-family home. I interpret these findings as evidence that the supply effect is around -1.6%, whereas the dis-amenity effect is about zero.[5] However, there is some evidence that these effects vary depending on whether the foreclosure occurs in a low vacancy rate census tract or a high vacancy rate census tract. The supply effect appears to be more negative in low vacancy rate census tracts than in high vacancy rate tracts. This result is consistent with the theoretical prediction from the search and matching model of housing presented in Wheaton [1990] in that marginal increases in the vacancy rate have diminishing effects on prices as the vacancy rate rises. On the other hand, the dis-amenity effect appears to be about zero in low vacancy rate census tracts and is negative in high vacancy rate tracts.

[4]This finding is in line with the findings of several other recent studies. Immergluck and Smith [2006a] find about a 1% reduction in the price of single-family homes in Chicago in 1999 for each foreclosure within one eighth of a mile. Schuetz et al. [2008] find a smaller effect, about a 0.2% reduction in price, in New York City between 2000 and 2005 in a 250 foot radius. It is not surprising that I find a larger effect. The New York City housing market was booming during their sample, whereas my sample includes the subsequent bust as well. As opposed to the hedonic framework used by the two aforementioned studies, Harding et al. [2009] use a repeat sales framework and find effects of a similar magnitude in several MSAs. Using data from Massachusetts, Campbell et al. [2010] also find a spillover effect of about -1% per foreclosure within about 250 feet. Lin et al. [2007] find much larger effects using data from 2003 and 2006 from Chicago, but their results may be biased by not having a complete listing of all foreclosures. See also Calomiris et al. [2008].

[5]Using data from Columbus, OH in 2006, Mikelbank [2008] finds an effect of about -2.4% for each foreclosure within 250 feet and an effect of about -4.0% for each vacant and abandoned building within 250 feet. While both of these effects are larger than the effects that I measure, it may be due to the fact that he does not control for differences in price between different areas of the city, except through the use of several neighborhood characteristic variables.

2 Data

I use data from several sources. Residential property sales data come from the Cook County Recorder of Deeds and the Chicago Tribune. Foreclosure data for Cook County are from a private data provision company named Record Information Services. Property characteristic data and homeowner tax exemption claim data come from the Cook County Tax Assessor's Office.

Property identification numbers allow the foreclosure and sales data to be linked to the property characteristic and tax exemption data. After geocoding the addresses, I calculate the distance between every sale and every foreclosure. Since I am interested in the effect of foreclosures on nearby properties but not on the foreclosed properties themselves, I drop any sale that is for the same property identification number and occurs less than two years before or after a foreclosure. Table 1 presents descriptive statistics for single-family residential property transactions in the City of Chicago from 1999 through 2008. The first two sections present data regarding the number of single-family (SFR), renter-occupied multi-family (RO MF), owner-occupied multi-family (OO MF), and condominium foreclosure filings and auctions that occurred within the past year within 250 feet or between 250 feet and 500 feet of a single-family residence property transaction. The third section presents data regarding the sales price and structural characteristics of these properties.[6] Here and throughout the rest of the paper, I limit my sample to single-family homes because detailed data on the structural characteristics of these properties are available from the Cook County Tax Assessor's office. In contrast, the only structural characteristic that is available for condominium units is the age of the building. The final section presents data regarding the year 2000 demographics of the census tracts in which the properties are located.

The foreclosure data contain entries for two types of events. These events are the initial filing of the foreclosure and the auction date of the foreclosure if an auction is ever scheduled. For the properties for which an auction is observed the mean time from filing to auction is eleven months, the median is about eight months, the first percentile is 3 months, and the 99th percentile is about four years. I include both types of events in my sample. In the end, the preferred sample that I use for estimation includes roughly all single family residential property transactions in the City of Chicago from 1999 through 2008 and counts

[6] Throughout this paper all prices are real, expressed in terms of year 2000 dollars.

of the number of initial foreclosure filings within the past year and within 250 feet or from 250 to 500 feet for each of the following categories: Single-family home foreclosure, renter-occupied multi-family building foreclosure, owner-occupied multi-family building foreclosure, and condominium foreclosure. Figure 1 plots the number of foreclosure auctions of each property type that were scheduled each year from 1998 through 2008. Single family homes experience the largest number of foreclosures, but there are also a significant number of renter-occupied multi-family buildings that come up for auction due to foreclosure. The number of units in the renter-occupied multi-family buildings brought to auction due to foreclosure ranges from 2 to 180. The mean number of units per building is 2.6 and the standard deviation is 2.7. Figure 2 shows a map of Chicago. Census tracts in which at least one owner-occupied single-family foreclosure and at least one renter-occupied multi-family building foreclosure occurred between 1998 and 2008 are indicated with gray shaded cross-hatching. The dark lines shown in Figure 2 represent community area boundaries. In this paper, I refer to two types of geographical subdivisions of the the city of Chicago. The finer divisions are census tracts. As of the 2000 Census, Chicago contained 873 census tracts with an average population of 3,376. The coarser divisions are community areas. Community areas are made up of a number of census tracts and have an average population of 38,277.[7]

3 Empirical Methodology

My goals are to estimate the effect of residential foreclosures on the price of nearby property and to separate this estimate into a component due to excess supply induced by foreclosures and a component due to the dis-amenity of nearby foreclosures stemming from deferred maintenance or vacancy. Basically, my strategy is to separately estimate the effect of a single-family home foreclosure on nearby single-family home property values and the effect of a multi-family apartment building foreclosure on nearby single-family home property values. Then, with a few assumptions outlined below, I interpret the effect of a single-family home foreclosure as representing the combined effect of putting an additional single-family-home on the market and the dis-amenity effect of deferred maintenance or vacancy on the nearby properties. In comparison, under the assumption that the single-family and multi-family housing markets are segmented, I interpret the effect of a multi-family apartment

[7] I use the terms neighborhood and community area interchangeably throughout this paper. See `http://en.wikipedia.org/wiki/Community_areas_of_Chicago` for a discussion of Chicago community areas.

building foreclosure on nearby single-family home property values as being due only to the dis-amenity effect of deferred maintenance or vacancy on the nearby properties. Let β_{SF} represent the effect of a single-family home foreclosure on nearby single-family home values and β_{MF} represent the per-unit effect of an N unit multi-family building on nearby single-family home values, then under the assumption of segmentation the impact of a single family home foreclosure and an N unit multi-family building foreclosure on nearby single family home values can be expressed as,

$$\beta_{SF} = S + D$$

and

$$N\beta_{MF} = N * D,$$

where S represents the supply effect per unit of housing in foreclosure and D represents the dis-amenity effect per unit of housing in foreclosure. Thus,

$$S = \beta_{SF} - \beta_{MF} \tag{1}$$

and

$$D = \beta_{MF}. \tag{2}$$

Finally, under the assumption that single-family and multi-family housing markets are integrated, I interpret the effect of a multi-family apartment building foreclosure on nearby single-family home property values as being due to a composite effect of one additional unit of supply (the unit that could potentially become the new owner's home) and a dis-amenity effect of deferred maintenance or vacancy that is proportional to the number of units in the building. In the integration case,

$$\beta_{SF} = S + D$$

and

$$N\beta_{MF} = S + ND.$$

Thus,

$$S = \frac{N}{N-1}(\beta_{SF} - \beta_{MF}) \tag{3}$$

and

$$D = \frac{N}{N-1}\beta_{MF} - \frac{1}{N-1}\beta_{SF}. \tag{4}$$

Several assumptions are necessary in order to interpret my results in this manner. Under segmentation, the first assumption is that multi-family apartment building foreclosures do not add to the supply of single-family homes for sale. This assumption requires that potential buyers of single-family homes do not regard multi-family apartment buildings as substitutes and that sellers cannot quickly convert multi-family apartment buildings to condominiums and sell the units individually. Anecdotal evidence from real estate brokers that I spoke with suggests that these assumptions hold in practice.[8] While it is difficult to directly measure the degree to which potential buyers view a multi-family apartment buildings as a potential substitute for a single-family home, it is possible to assess the frequency with which multi-family apartment building foreclosures result in a renter-occupied building becoming owner-occupied. Data from the Cook County Tax Assessor on claims of the owner-occupied tax exemption for the years 2004 - 2007 reveal that only about 3.3% of multi-family buildings that experienced a foreclosure in one year or the following year did not file an owner-occupied exemption in the first year but did file an owner-occupied exemption in the second year. This suggests that entirely renter-occupied multi-family apartment buildings do not frequently become owner-occupied following a foreclosure. While I do not have direct evidence regarding the degree to which potential home-buyers regard currently owner-occupied multi-family apartment buildings as substitutes for single-family homes, it is clear that renter-occupied multi-family buildings in foreclosure are not commonly used as a substitute for a buyer in the market for a single-family home. Otherwise, the new owner-occupier would claim the tax exemption, and the transition rate of renter-occupied to owner-occupied foreclosed multi-family apartment buildings would be higher than 3.3%. Finally, I also consider the case of integration of single-family and multi-family housing markets. In this case, the assumption is that potential buyers of single-family homes do regard multi-family apartment buildings as substitutes, but only one household of owner occupiers can live in a multi-family building and, again, that multi-family apartment buildings cannot be quickly converted to condominiums and sold as individual units.

[8] Chris Young, Sales Associate, Coldwell Banker, Cambridge, MA says, "Rarely have crossover b/w owner-occupied MF and SF/Condo. During property searches, the parameters are separated Condo/SF/MF. Sometimes I get a buyer who's looking SF & Condo, but for the most part they stick with one type. Once they have one type in their head, they stay locked in."

The second assumption is that both single-family home foreclosures and multi-family apartment building foreclosures create dis-amenities for neighboring single-family homes because of deferred maintenance or vacancy. While it is difficult to obtain historical vacancy status data for particular properties, the United States Postal Service has aggregated a number of measures of stocks and flows of vacancy by census tract at a quarterly frequency.[9] Table 2 presents estimates of the association between the number of different types of residential foreclosures and the number of residential addresses that have become vacant in the past three months. These estimates come from a regression of the number of newly vacant addresses in a census tract-quarter on the number of condominium foreclosures, single-family foreclosures, and multi-family foreclosures in the same census tract-quarter. Quarter effects are included to account for time trends in the number of new vacancies, and community area effects are included to account for differences in the number of new vacancies across neighborhoods. The data are for all census tracts in the City of Chicago and cover the four quarters in 2008. The foreclosure data are counts of the number of units of each type of residential housing that are scheduled to be sold at a foreclosure auction in a particular census tract-quarter.

The estimate presented in the first row of Table 2 indicates that each additional condominium unit scheduled for foreclosure auction is associated with 1.76 newly vacant units. The fact that this estimate is larger than one implies that the estimate is picking up more than just the vacancies due to condominium foreclosures; otherwise the estimate could not exceed one. The estimator uses differences in foreclosures between census tracts within a particular community area to explain differences in the number of newly vacant addresses between these census tracts. While the estimate for the effect of condominium foreclosures on the number of newly vacant addresses implies that there are omitted factors that influence the number of new vacancies and are correlated with the number of condominium foreclosures, it is still important to note that at the census tract level of detail there is a positive correlation between foreclosure auctions and the number of newly vacant addresses. Furthermore, the coefficients on the number of single-family units being auctioned due to foreclosure and the number of multi-family renter-occupied units being foreclosed due to auction are 0.93 and 0.77, respectively and are not statistically different from each other. This implies

[9] The data are available through the HUDuser website: `http://www.huduser.org/portal/datasets/usps.html`

that single-family home foreclosures and multi-family apartment building foreclosures are associated with a similar number of newly vacant addresses on a per unit basis.

While it may seem counter-intuitive that lenders who are foreclosing on multi-family apartment buildings would move to evict rent-paying tenants, the practice occurs sufficiently often that toward the end of 2008, the Cook County Sheriff, Thomas J. Dart, suspended all mortgage foreclosure evictions until more protections for tenants of foreclosed multi-family buildings were put into place.[10] The primary motivation for lenders to evict tenants from multi-family buildings that are in the process of foreclosure is that it resolves a potential informational problem faced by potential buyers. Knowing that a building is vacant may be more attractive to a buyer at a foreclosure auction who typically does not have a lot of information about the property and may not have enough time to examine lease contract terms and tenant credit history information. Furthermore, in the case that the lender's reservation price is not met at auction, ownership of the property will go to the lender, who may not have expertise in the property management business. Another possibility is that tenants may choose to move out if multi-family apartment buildings are not maintained properly during the foreclosure period.[11]

The final assumption is that the dis-amenity created by deferred maintenance or vacancy stemming from a multi-family building foreclosure is comparable to the dis-amenity created by deferred maintenance or vacancy stemming from a single-family foreclosure or that these two effects can be compared after controlling for the number of units in the multi-family apartment building.

Conditional on the assumptions outlined above, my analysis relies upon obtaining credible estimates of the effect of single-family home foreclosures and multi-family apartment building foreclosures on nearby property values. To achieve this I analyze the prices of single-family home sales in Chicago between 1999 and 2008. I compute the number of single-family, renter-occupied multi-family, owner-occupied multi-family, and condominium homes in distance-based rings surrounding each transaction. I estimate a number of different variations of the

[10] The overhaul of Cook County's mortgage eviction process and the safeguards added to protect renters are described here: `http://www.cookcountysheriff.org/press_page/press_evictionSafeguards_10_16_08.html`. This action occurred right at the end of my sample period, so I do not believe that it has the potential to significantly impact my estimates; however, as more data are available, there is the potential that this policy change may have provided an exogenous change in foreclosure induced vacancies that could aid in estimating the dis-amenity effect of foreclosures on nearby property values.

[11] Been and Glashausser [2009] discuss the effect of foreclosures on tenants.

following specification,

$$\ln P_{i,j,c,t} = \beta F_{i,j,c,t} + \Gamma X_i + \delta C_j + \xi N_{c,t} + \varepsilon_{i,j,c,t} \tag{5}$$

where $\ln P_{i,j,c,t}$ is the log transaction price of single-family home i, located in census tract j, in community area c, in year t. $F_{i,j,c,t}$ is a vector of variables indicating the number of initial foreclosure filings or foreclosure auctions within a certain time and distance of property i. Two of the variables contained in the vector $F_{i,j,c,t}$ are $f_{SF,i,j,c,t}$ and $f_{MF,i,j,c,t}$, the number of single-family housing units scheduled for foreclosure in the past year and the number of renter-occupied multi-family housing units scheduled for foreclosure in the past year, respectively. The coefficients corresponding to these two variables are β_{SF} and β_{MF} which are two components of the vector β. X_i is a vector of property specific characteristics, C_j is a vector of census tract indicator variables, and $N_{c,t}$ is a hedonic price index that varies by community area and year.

In my preferred specification, I control for all available structural characteristics of the properties. I include census tract effects to control for persistent differences in prices across space. Furthermore, I include a community area-by-year price index to control for time trends in housing prices at the community area level.

4 Results

In this section I present estimates of the effect of foreclosures on nearby property values using a number of different specifications. All specifications shown in Tables 3, 4, and 5 include census tract effects to control for persistent factors that affect prices across the city at a relatively fine level of geography. Examples of such factors include persistent differences in amenity levels across the city, such as proximity to train stations or to Lake Michigan. All specifications also include structure characteristics to control for differences in single family home prices that are driven by size, number of bedrooms, and amenities such as garages, attics, and basements.[12]

Table 3 presents estimates of the effect of the foreclosure of any type of residence (single-family, condominium, or multi-family) on nearby property values. The sample includes all single-family home transactions from 1999 through 2008. For each transaction, variables

[12] A detailed list of the structure characteristics included can be found in the notes for Table 3.

containing counts of the number of initial foreclosure filings and the number of scheduled foreclosure auctions in the year prior to the transaction are computed for areas within 0 - 250 feet and 250 - 500 feet of the transacted home. Dummy variables indicating whether the property is between 1500 and 2000 feet of the nearest foreclosure or more than 2000 feet away from the nearest foreclosure are included so that reported coefficients can be interpreted as the impact of a foreclosure in the 0 - 250 foot range or the 250 - 500 foot range compared to the baseline price of properties where the nearest foreclosure is in the 500 - 1500 foot range. As detailed in the note for Table 3, all specifications contain controls for a vector of structure characteristics.

Table 3 contains estimates of five different specifications. Before discussing each specification in detail it may be helpful to give a brief overview of the table. Column (1) presents a specification which is purposefully naive and does not control in any way for the fact that home price appreciation varies during the sample period. Column (2) introduces one way to control for time-varying home prices; by estimating the effect of foreclosures that occur in the year following a single-family home transaction, and then subtracting that from the estimated effect of a foreclosure in the previous year. Column (3) adds a more direct type of control for time-varying home prices, a neighborhood housing price index. This specification reveals that once neighborhood housing prices are controlled for, it is no longer important to control for time varying home prices in the other manner. Thus, column (4) does not include controls for the number of foreclosures in the following year. Finally, column (5) presents a slightly more simplified specification which does not attempt to estimate separate foreclosure filing and auction effects; instead it simply uses the number of foreclosure filings to estimate the combined effect of a filing that is possibly followed by an auction.

Column (1) of Table 3 presents a specification that estimates the effects of foreclosure filings and auctions separately. The estimate presented in the second row of column (1) implies that each foreclosure filing within 250 feet in the previous year is associated with about a 0.4% increase in the price of a single-family home. The positive sign of this estimate may be due to the fact that the specification in column (1) does not adequately control for the fact that foreclosures are more likely to occur in neighborhoods where home prices rose and then fell leaving recent home-buyers with little equity. This explanation is consistent with the results shown in the remaining columns which do control for time-variation in

neighborhood home prices. The estimate in the third row of column (1) indicates that each additional foreclosure auction within 250 feet of a single-family home that occurred in the past year is associated with about a 2.9% decrease in its sale price. Campbell et al. [2010] obtain estimates of about -6.6% (at 125 feet) and -1.7% (between 528 and 1320 feet) using a similar specification with data from Massachusetts. The difference between their estimates gives a discount of about 4.9%, a bit larger in magnitude than the 2.9% discount that I measure. The estimates in rows five and six of column (1) indicate the each foreclosure filing within the past year between 250 and 500 feet is associated with an increase in property values of about 1.3% and each foreclosure auction in the same range is associated with a decrease in property values of about 1.5%. For this specification, the estimates of the filing and auction effects presented in the lower section of the table are equivalent to the estimates presented in rows two, three, five, and six.

One problem with the specification presented in column (1) of Table 3 is that if foreclosures tend to occur in areas where property values have increased over the sample period, then the coefficients on the foreclosure filings and foreclosure auctions will be due to a comparison of post-foreclosure prices to some average of the prior increasing series of pre-foreclosure prices. To get a better estimate of the true change in prices from the period just before to the period just after the foreclosure, the specification in column (2) adds controls for the number of foreclosure filings in the year following the observed single-family home sale. This strategy is employed by Campbell et al. [2010] and can be viewed as a kind of time-differencing.[13] The estimates presented in rows one and four of column (2) show that single-family home sales have prices that are about 3% higher for each additional foreclosure filing that occurs within 500 feet in the following year. Indeed areas where prices have recently increased tend to be associated with subsequent foreclosure filings. The lower section of column (2) presents the difference between the post-filing or post-auction estimates and the pre-filing estimate. Thus the coefficient in row one of the lower section of column (2) can be obtained by subtracting the coefficient in row 1 of the upper section from the coefficient in row 2 of the upper section. The estimates in column (2) imply that foreclosure filings and auctions are associated with large drops in prices for nearby single-family homes. The estimates imply that each foreclosure filing within 250 feet that occurred in the previous

[13] Campbell et al. [2010] attribute the inspiration for this strategy to Linden and Rockoff [2008].

year is associated with a price reduction of about 3.7% and each auction is associated with a price reduction of about 6.8%.

However, since property price declines influence the probability of foreclosure (see Foote et al. [2008]), the estimates presented in column (2) may be negatively biased because they do not adequately control for changes in neighborhood home prices. As a remedy, the specification presented in column (3) of Table 3 adds a hedonic price index calculated by community area by year.[14] Controlling for local shocks that may affect both prices and foreclosures in this manner reduces the magnitude of the estimated coefficient on foreclosure filings and auctions to about a 1.1% discount for each filing and about a 1.3% discount for each auction within 250 feet. The estimates for filings and auctions between 250 and 500 feet are no longer statistically distinguishable from zero.

One thing that is evident when comparing the specifications in columns (2) and (3) is that adding the neighborhood price index reduces the magnitude of the coefficient on foreclosure filings that occur in the year after the sale within 250 feet. The coefficient reported in row one of column (3) is close to zero and its difference from zero is not statistically significant. The magnitude of the coefficient reported in row 4 of column (3) is also much smaller than that of column (2). For the estimates of the effect of foreclosures that occur within 250 feet it appears that once a neighborhood price index is included it is not terribly important to also include the number of foreclosure filings in the year after the sale and do the time-differencing. Column (4) presents a specification that is similar to column (3) but which does not include the number of foreclosure filings in the year following the sale. The coefficients on the number of foreclosure filings and auctions within 250 feet do not change by much and the standard errors reported in the lower section become smaller. The estimates of the filing and auction effects presented in the bottom section of columns (4) and (5) are equal to those displayed in the upper section since I am no longer subtracting the coefficient on the number of filings in the following year.

Finally, column (5) presents a specification similar to column (4) except that the foreclosure auction variables have been dropped. Since a large number of foreclosure filings lead to foreclosure auctions within a year, the number of foreclosure filings and auctions

[14] The index is calculated by regressing log price on all of the available structure characteristics and dummy variables for all community area by years combinations. The index value for each community area in each year is calculated by setting the structure characteristics to their mean value for the entire city and taking the value predicted by the regression equation for each particular community area and year combination.

that occurred within the past year are correlated, thus estimating the effect of either filings or auctions may result in smaller standard errors. Including only the number of auctions and not the number of filings in the regression could potentially overstate the impact of an auction since there are some filings that do not result in an auction within a year yet still may impose a negative externality on the nearby homes through either dis-amenity if maintenance is deferred or the property becomes vacant or through the expectation of additional supply which will be public knowledge once the foreclosure is filed. Thus, when picking between only estimating the effect of filings or only estimating the effect of auctions, I prefer to estimate only the effect of the filing as it is less likely to overstate the negative impact of a foreclosure. The coefficient in row two of column (5) reveals that each foreclosure filing within 250 feet is associated with about 1.5% lower single family home sales prices. This estimate is close to the 1% reduction implied by the preferred specification of Campbell et al. [2010].[15]

4.1 Interpreting Results Assuming Segmentation of Single-Family and Multi-Family Markets

Table 4 presents estimates of the effect of single family residence (SFR) and renter-occupied multi-family (RO MF) foreclosure filings on the price of nearby single-family homes. The estimates presented are from a specification similar to that of column (5) in Table 3 except that variables are included for each type of foreclosed property: single-family residence, renter-occupied multi-family, owner-occupied multi-family, and condominium.

Columns (1) and (2) of Table 4 present specifications that are linear in the number of foreclosure filings, while columns (3) and (4) present specifications that are quadratic in the number of filings. Columns (1) and (3) use the full sample of single family home transactions, while columns (2) and (4) are limited to single family home transactions that occurred in census tracts that had at least one single family foreclosure filing and at least one renter-occupied multi-family foreclosure filing during the sample period. These census tracts are marked by cross-hatching in Figure 2.

[15] Campbell et al. [2010] use a linear distance-weighted count of foreclosures from 0 to 528 feet, and a simple count of foreclosures from 528 to 1320 feet. Since my estimates can be interpreted as comparisons to transactions within 500 and 1500 feet of a foreclosure, my estimate of the coefficient on the number of foreclosures between 0 and 250 feet, is comparable to their distance weighted coefficient (labelled "close" in their paper) evaluated at 125 feet minus their estimate of the effect of foreclosures from 528 to 1320 feet (labelled "far" in their paper). The comparison that I report above, comes from multiplying their "close" estimate by (528-125)/528 and subtracting their "far" estimate.

Column (1) indicates that each single family foreclosure filing within 250 feet is associated with a discount of about 1.6%, while single family foreclosure filings in the 250 to 500 foot range and the per unit discount of multi-family foreclosure filings within 250 feet or in the 250 - 500 foot range are all associated with about a 0.5% discount.

The bottom panel of Table 4 presents estimates of the segmented market supply and dis-amenity effects. As shown in Equation 1, the supply effect is calculated by subtracting the estimated per-unit effect of a renter-occupied multi-family foreclosure from the effect of a single family residence foreclosure. Thus, the supply effect shown in row one of the bottom section is calculated by subtracting the multi family effect from the single family effect shown in the upper part of the table. Each extra unit of supply within 250 feet is associated with a discount of about 1.2%, while there is roughly zero discount for an additional unit of supply in the 250 - 500 foot range. As shown in Equation 2, the dis-amenity effect is simply the estimated per-unit effect of renter-occupied multi-family foreclosures. Each foreclosure filing is associated with a dis-amenity effect of about -0.5% whether it is with 250 feet or in the 250 - 500 foot range. The coefficients presented in column (2) are quite similar to those in column (1) except that the magnitudes are slightly larger.

4.2 Interpreting Results Assuming Integration of Single-Family and Multi-Family Markets

Although I find it reasonable to assume that the single-family and multi-family housing markets are segmented, it is informative to consider the case in which these markets are integrated in order to consider the impact that this would have on my estimates. The average number of units in a foreclosed multi-family building in Chicago during my sample is 2.6. If the single-family and multi-family markets were integrated, but multi-family buildings could not be converted to condominiums in the short run, then the effect of a multi-family building foreclosure would be to add one additional unit of supply to the combined single-family / owner-occupied multi-family market. With this assumption, Equations 3 and 4 can be used to calculate the supply and dis-amenity effects. In this case, the supply effect would be about -1.9% within 250 feet (statistically significant at the 5% level), and the dis-amenity effect is about zero within 250 feet. In summary, switching from an assumption of segmentation to integration of the single-family and multi-family housing markets changes my estimate of the supply effect from about -1.2% to about -1.9% and changes my estimate of the dis-

amenity effect from about -0.4% to about zero. Since I find the segmentation assumption more plausible, the rest of the results presented in the paper assume segmentation.

4.3 Variation in Effect by Number of Nearby Foreclosures

Columns (3) and (4) of Table 4 present estimates of specifications which are similar to those presented in columns (1) and (2) except that for each distance-based band and each type of foreclosure a quadratic term is also included. To save space, only the estimates of the coefficients for single-family home and renter-occupied multi-family apartment building foreclosures are shown. These estimates provide empirical evidence regarding whether the marginal effect of an additional nearby foreclosure increases or decreases as the number of nearby foreclosures increases. The estimates presented in the first two rows of column (1) reveal that the marginal effect of a single-family home foreclosure within 250 feet is increasing in the number of such foreclosures. In comparison, rows five and six of column (3) reveal that the marginal effect of a multi-family building foreclosure is decreasing and remains roughly constant as the number of these foreclosures increases (on a per unit basis). Column (2) presents the same specification as column (1), but is estimated on the sub-sample of transaction in census tracts that have at least one of each type of foreclosure. The coefficients in column (4) are similar to those in column (3). The bottom panel of columns (3) and (4) present estimates of the supply and dis-amenity effects evaluated at one foreclosure. It is interesting to note that the supply effects are now positive and for the most part indistinguishable from zero, while the dis-amenity affect is now negative and significant. Figures Figure 4a and Figure 4b shed some light on why this is. The reason is that the supply effect does not increase linearly with the number of foreclosures; instead, the supply effect is near zero at one foreclosure, but becomes increasingly more negative with each additional foreclosure.

Figure 4a plots the the effect of single family foreclosures and the per-unit effect of multi-family foreclosures implied by the coefficients presented in column (3) of Table 4 as the number of foreclosure filings within 250 feet varies between one and three. Over this range the the per-unit multi-family effect is close to linear, while the single-family effect becomes much more pronounced when considering the change between two and three foreclosures than it does when considering the change between one and two foreclosures. The upper

and lower bounds of the 95% confidence intervals are indicated by dashed lines. Figure 4b plots the supply and dis-amenity effects implied by the estimates in Figure 4a assuming segmentation of single-family and multi-family markets. Throughout this range the supply effect is indistinguishable from zero and the dis-amenity effect is just barely significantly less than zero. However, the supply effect does appear to be getting more negative as the number of nearby foreclosures increases. The fact that additional supply has an increasingly negative effect on nearby home prices as the number of foreclosures gets larger is at odds with the theoretical search and matching model discussed in Wheaton [1990]. In that model, increases in the vacancy rate have a negative impact on prices, but the marginal negative impact of an increase in the vacancy rate diminishes as the vacancy rate increases. However, it is important to remember that there is heterogeneity in the vacancy rate across neighborhoods in Chicago. The next sub-section splits the sample into low and high vacancy rate sub-samples and addresses whether the supply effect is more pronounced in the low vacancy rate sub-sample.

4.4 Variation in Effect by Vacancy Rate

In order to determine how the marginal effect of a foreclosure on nearby property values varies with the tightness of the housing market, this sub-section splits the sample into low and high vacancy rate sub-samples. Table 5 presents estimates for the same specifications as those in Table 4 but for a sub-sample of low vacancy rate census tracts and a sub-sample of high vacancy rate census tracts. Figure 3 shows a map classifying Chicago census tracts by whether their vacancy rate is above or below the median census tract vacancy rate of 5.17%. Census tract vacancy rates are calculated from USPS data from 2005 - 2008. Assuming market segmentation, the estimates in column (1) imply a statistically significant supply effect of -1.5% and a dis-amenity effect of about zero per unit of foreclosure within 250 feet in low vacancy rate census tracts. However, the estimates in column (2) imply a significant dis-amenity effect of about -0.9% per unit of foreclosure within 250 feet but no statistically significant supply effect in high vacancy rate census tracts. Consistent with the theoretical results illustrated in Wheaton [1990], the supply effect appears to be more pronounced in a tight housing market.

The coefficients presented in column (3) of Table 5 are plotted in Figures 5a and 5b,

and the coefficients presented in column (4) of Table 5 are plotted in Figures 5c and 5d. These plots reveal that the dis-amenity effect only appears to be present in high vacancy rate census tracts. In the low vacancy rate tracts, the supply effect is slightly positive, but not significantly different from zero. On the other hand, the supply effect is significantly less than zero in the low vacancy rate census tracts for two or more foreclosures. It is also interesting to note that the supply effect shown in Figure 5b has less curvature than the supply effect plotted in Figure 4b. It appears that once the underlying variation in vacancy rates across neighborhoods is taken into account, the results do not contradict the theoretical predictions of Wheaton [1990], in which the marginal effect of an additional unit of supply decreases as the vacancy rate increases.

5 Conclusion

In the face of falling housing prices and rising foreclosure rates, researchers have sought to determine the size and geographical extent of spillover effects from residential mortgage foreclosures. The main contribution of this paper is to decompose foreclosure spillover effects into effects that are operating through two distinct mechanisms: a supply shock mechanism and a dis-amenity mechanism.

Before decomposing the spillover effects of foreclosures, I replicate the results of two recent studies: Campbell et al. [2010] and Schuetz et al. [2008]. I find very similar results to the former study, which uses data from Massachusetts and a similar sample period. I find that foreclosures are associated with larger discounts in the price of nearby properties than did the latter study, but this may be due to the fact that it uses data from New York City during the peak of its recent housing boom.

After decomposing the supply and dis-amenity effects, I find that the both the supply and dis-amenity effects vary with the vacancy rate of the census tract. In low vacancy rate census tracts, the supply effect is about -1.6% per foreclosure and the dis-amenity effect is about zero. However, in high vacancy rate census tracts, there is little evidence of a supply effect, while the dis-amenity effect is about -2% per foreclosure.

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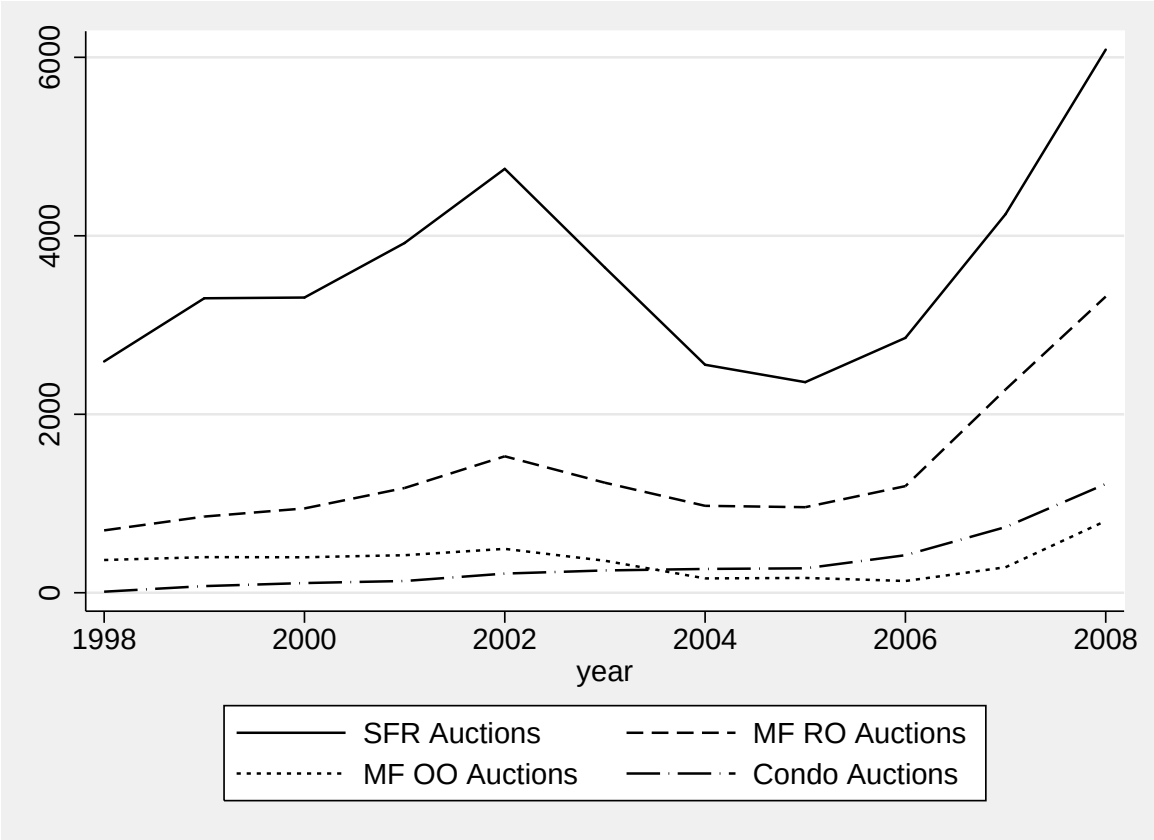


Figure 1: Chicago Foreclosure Auctions by Property Type

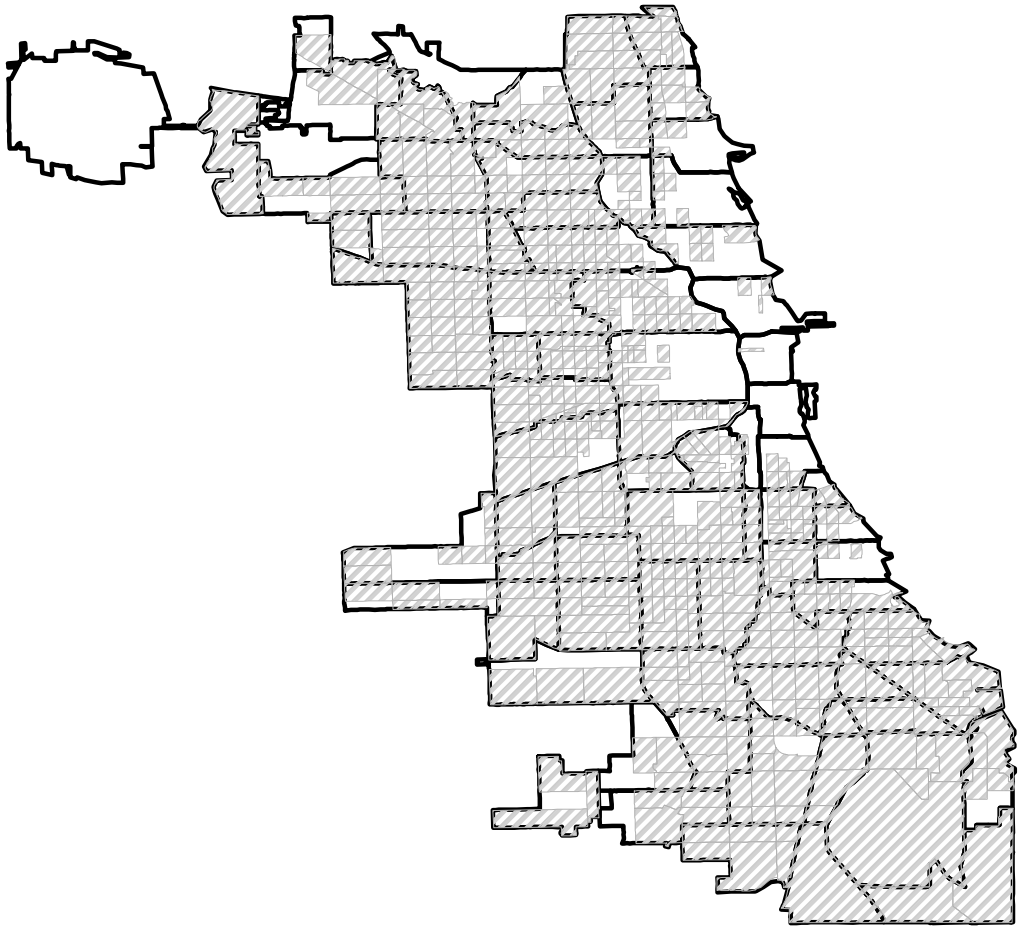


Figure 2: Chicago Community Areas and Tracts with both SFR and RO MF Foreclosures

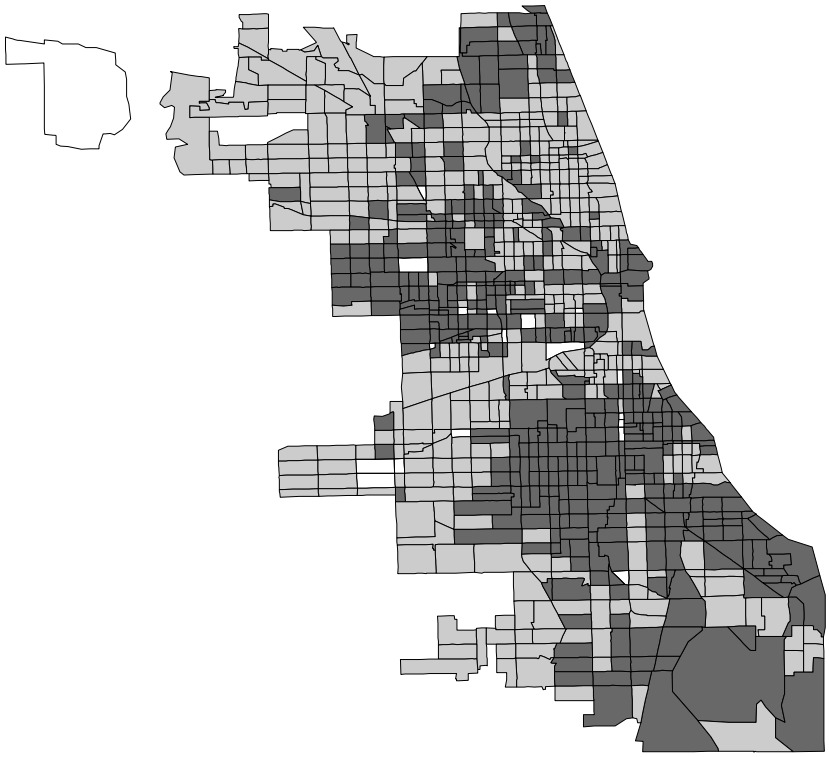
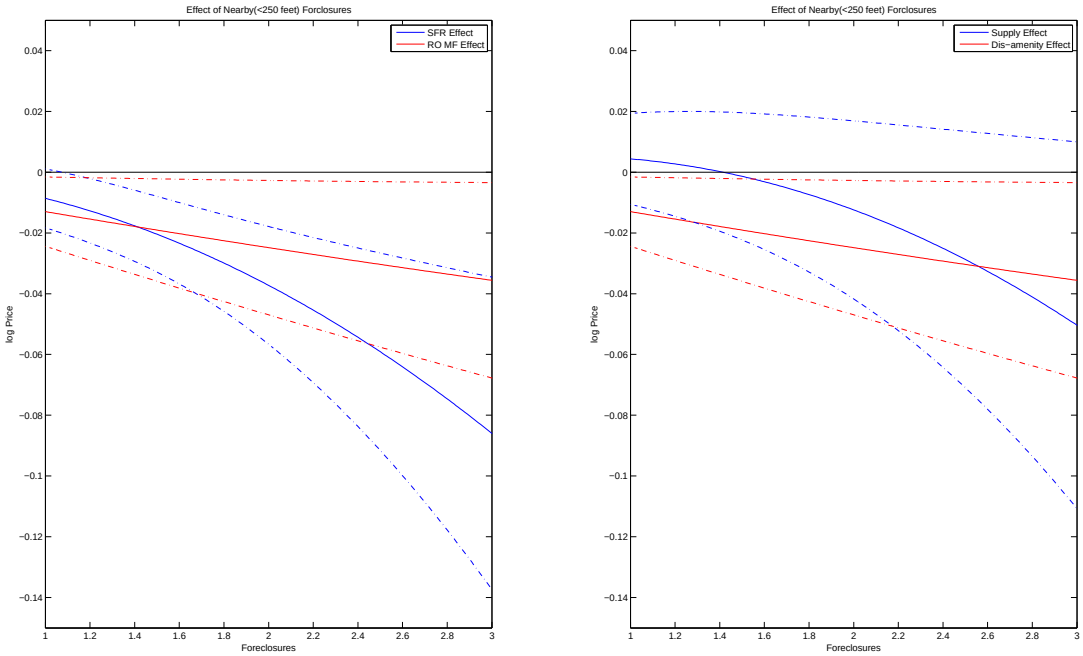


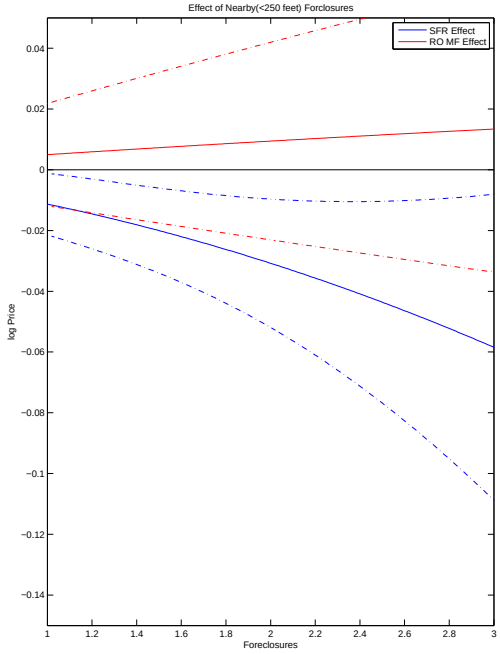
Figure 3: High and Low Vacancy Rate Census Tracts. Above Median Vacancy Rate (5.17%) Tracts in Dark Gray. Below Median Vacancy Rate Tracts in Light Gray.



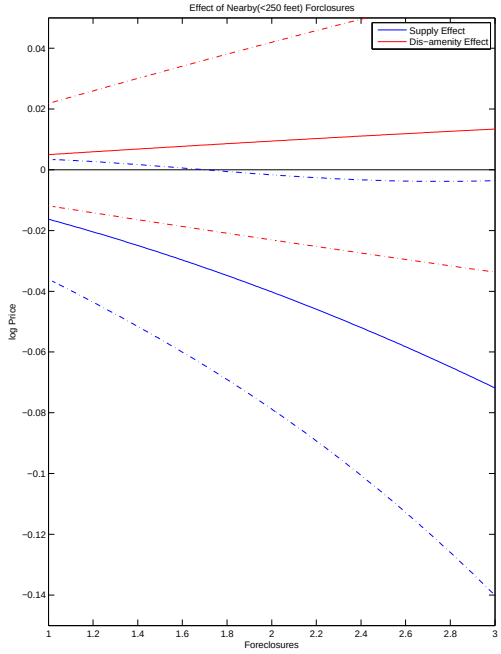
(a) SFR and RO MF effects.

(b) Supply and Disamenity effects.

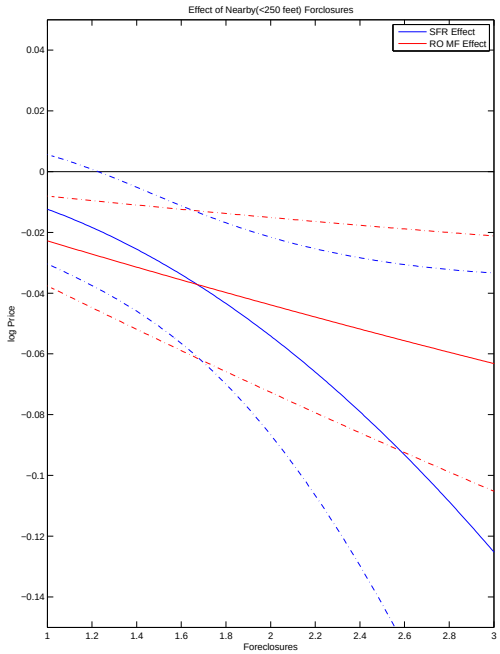
Figure 4: Non-linear Effects of Foreclosures



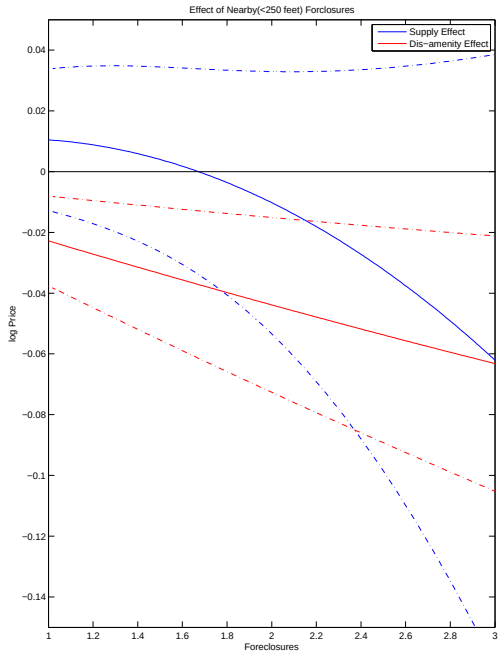
(a) Low Vac. Rate Tracts: SFR and RO MF effects.



(b) Low Vac. Rate Tracts: Supply and Disamenity effects.



(c) High Vac. Rate Tracts: SFR and RO MF effects.



(d) High Vac. Rate Tracts: Supply and Disamenity effects.

Figure 5: Non-linear Effects of Foreclosures

Table 1: Descriptive Statistics of Nearby Foreclosures, Property Characteristics and Census Tract Characteristics for SFR Property Transactions (N = 93,313)

	Mean	S.D.	Min	Max
SFR Forc Filings (past year) $0-250$ ft.	0.10	0.35	0	7
SFR Forc Auctions (past year) $0-250$ ft.	0.05	0.24	0	4
SFR Forc Filings (past year) $250-500$ ft.	0.23	0.60	0	8
SFR Forc Auctions (past year) $250-500$ ft.	0.12	0.39	0	6
Units of RO MF Forc Filings (past year) $0-250$ ft.	0.04	0.47	0	40
Units of RO MF Forc Auctions (past year) $0-250$ ft.	0.02	0.27	0	16
Units of RO MF Forc Filings (past year) $250-500$ ft.	0.13	0.92	0	40
Units of RO MF Forc Auctions (past year) $250-500$ ft.	0.06	0.50	0	39
Units of OO MF Forc Filings (past year) $0-250$ ft.	0.02	0.22	0	6
Units of OO MF Forc Auctions (past year) $0-250$ ft.	0.01	0.12	0	7
Units of OO MF Forc Filings (past year) $250-500$ ft.	0.05	0.37	0	9
Units of OO MF Forc Auctions (past year) $250-500$ ft.	0.02	0.21	0	7
Condo Forc Filings (past year) $0-250$ ft.	0.00	0.08	0	6
Condo Forc Auctions (past year) $0-250$ ft.	0.00	0.04	0	4
Condo Forc Filings (past year) $250-500$ ft.	0.01	0.14	0	9
Condo Forc Auctions (past year) $250-500$ ft.	0.00	0.07	0	5
Price	204,006	163,684	7,675	1,655,599
Land Square Footage	3,925	1,595	460	122,465
Building Square Footage	1,326	585	400	27,270
2 Bathrooms	0.20	0.40	0	1
3+ Bathrooms	0.05	0.22	0	1
Masonry Exterior	0.54	0.50	0	1
Frame / Masonry	0.09	0.29	0	1
Basement	0.82	0.39	0	1
Attic	0.43	0.49	0	1
Garage	0.75	0.43	0	1
Central Air	0.28	0.45	0	1
Fireplace	0.13	0.34	0	1
Age of Structure	69.0	31.6	1	148
Tract Median Household Income in 2000	43,797	14,053	2,499	127,031
Tract Fraction African American in 2000	0.38	0.44	0	1
Tract Fraction Employed in 2000	0.54	0.10	0	1
Tract Fraction under 18 in 2000	0.27	0.07	0	0.63
Tract Fraction over 65 in 2000	0.12	0.05	0	1
Tract Fraction Female Head in 2000	0.15	0.05	0	0.41
Tract Fraction HS Grad in 2000	0.72	0.13	0.24	1
Tract Fraction College Grad in 2000	0.20	0.17	0	1
Tract Median Rent in 2000	636	121	99	2001

Table 2: Relationship Between Newly Vacant Addresses and Foreclosure Auctions

	# Newly Vacant Addresses in past 3 Months
Condo Units Scheduled for Auction	1.76**
	(0.77)
Single Family Houses Scheduled for Auction	0.93***
	(0.16)
Multi Family Units (Owner on Premises) Scheduled for Auction	0.49
	(0.39)
Multi Family Units (All Rental) Scheduled for Auction	0.77***
	(0.10)
R^2	0.30
N	2,401

Note: Unit of observation is census tract - quarter. All Chicago census tracts are included. The time period is the 4 quarters of 2008. Eicker-White standard errors are reported in parentheses. Community Area effects and Quarter effects are included. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 3: Effect of Any Type of Foreclosures on log Prices (N = 93,313)

	(1)	(2)	(3)	(4)	(5)
Any Forcs $0-250$ ft. (filing after sale)		0.031***	-0.002		
		(0.004)	(0.003)		
Any Forcs $0-250$ ft. (filing before sale)	0.004	-0.005	-0.013***	-0.014***	-0.015***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Any Forcs $0-250$ ft. (auction before sale)	-0.029***	-0.037***	-0.016***	-0.016***	
	(0.007)	(0.006)	(0.006)	(0.006)	
Any Forcs $250-500$ ft. (filing after sale)		0.030***	-0.004**		
		(0.002)	(0.002)		
Any Forcs $250-500$ ft. (filing before sale)	0.013***	0.002	-0.007***	-0.008***	-0.009***
	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)
Any Forcs $250-500$ ft. (auction before sale)	-0.015***	-0.024***	-0.004	-0.005	
	(0.004)	(0.004)	(0.004)	(0.004)	
Neighborhood Price Index			0.75***	0.75***	0.75***
			(0.01)	(0.01)	(0.01)
R^2	0.65	0.65	0.71	0.71	0.71
Filing Effect $0-250$ ft.	0.004	-0.037***	-0.011**	-0.014***	-0.015***
	(0.004)	(0.006)	(0.005)	(0.004)	(0.004)
Auction Effect $0-250$ ft.	-0.029***	-0.068***	-0.013*	-0.016***	
	(0.007)	(0.008)	(0.007)	(0.006)	
Filing Effect $250-500$ ft.	0.013***	-0.028***	-0.003	-0.008***	-0.009***
	(0.003)	(0.004)	(0.003)	(0.002)	(0.002)
Auction Effect $250-500$ ft.	-0.015***	-0.054***	-0.000	-0.005	
	(0.004)	(0.005)	(0.004)	(0.004)	

Note: Eicker-White standard errors are reported in parentheses. All specifications include indicator variables for whether there were any foreclosures between 1500 feet and 2000 feet of the property and for whether there were any foreclosures more than 2000 feet away from the property. All specifications include census tract effects and structure characteristics. Structure characteristics include the log of land square-footage, the log of building square-footage, a quartic in building age, and indicator variables for the following characteristics: 2 bathrooms, 3 or more bathrooms, masonry exterior, frame and masonry exterior, basement, full basement, finished basement, attic, full attic, finished attic, garage, detached garage, 2 car or larger garage, air conditioning, fire place. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 4: Effect of Foreclosures Types on log Prices by Type

	(1)	(2)	(3)	(4)
SFR filing $0-250$ ft., β_{SF}^{250}	-0.016***	-0.017***	0.001	-0.001
	(0.004)	(0.005)	(0.009)	(0.009)
SFR filing Sq. $0-250$ ft.			-0.0100**	-0.0095*
			(0.0051)	(0.0052)
SFR filing $250-500$ ft., β_{SF}^{500}	-0.006**	-0.008***	0.006	0.002*
	(0.002)	(0.003)	(0.005)	(0.006)
SFR filing Sq. $250-500$ ft.			-0.0044*	-0.0037*
			(0.0020)	(0.0021)
Units RO MF filing $0-250$ ft., β_{MF}^{250}	-0.004	-0.004	-0.014	-0.014**
	(0.004)	(0.004)	(0.006)	(0.006)
Units RO MF filing Sq. $0-250$ ft.			0.0006***	0.0006***
			(0.0002)	(0.0002)
Units RO MF filing $250-500$ ft., β_{MF}^{500}	-0.005**	-0.006***	-0.007**	-0.009***
	(0.002)	(0.002)	(0.003)	(0.003)
Units RO MF filing Sq. $250-500$ ft.			0.0001	0.0002
			(0.0001)	(0.0001)
Sample Restricted to Tracts with both types of Foreclosures	No	Yes	No	Yes
N	93,313	78,877	93,313	78,877
Supply $0-250$ ft., $\beta_{SF}^{250}-\beta_{MF}^{250}$	-0.012**	-0.013**	0.004	0.003
	(0.006)	(0.006)	(0.008)	(0.008)
Supply $250-500$ ft., $\beta_{SF}^{500}-\beta_{MF}^{500}$	-0.001	-0.002	0.009*	0.007
	(0.003)	(0.004)	(0.005)	(0.005)
Disamenity $0-250$ ft., β_{MF}^{250}	-0.004	-0.004	-0.013**	-0.014**
	(0.004)	(0.004)	(0.006)	(0.006)
Disamenity $250-500$ ft., β_{MF}^{500}	-0.005***	-0.006***	-0.008**	-0.009***
	(0.002)	(0.002)	(0.003)	(0.003)

Note: Eicker-White standard errors are reported in parentheses. Supply and Disamenity effects for foreclosures between 250 and 500 feet are estimates and are statistically indistinguishable from zero at the 5% level. All specifications include controls for the number of foreclosure filings for condo and multi-family owner-occupied properties. All specifications include indicator variables for whether there were any foreclosures between 1500 feet and 2000 feet of the property and for whether there were any foreclosures more than 2000 feet away from the property. All specifications include census tract effects and structure characteristics. See Table 3 note for description of structure characteristics. Supply and dis-amenity effects and standard errors reported in the bottom section of columns (3) and (4) are measured at one foreclosure. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 5: Effect of Foreclosures Types on log Prices by Type

	(1) Low Vac	(2) High Vac	(3) Low Vac	(4) High Vac
SFR filing $0-250$ ft., β_{SF}^{250}	-0.014***	-0.024***	-0.007	0.002
	(0.005)	(0.007)	(0.008)	(0.017)
SFR filing Sq. $0-250$ ft.			-0.0041	-0.0147
			(0.0046)	(0.0098)
SFR filing $250-500$ ft., β_{SF}^{500}	-0.004	-0.014***	0.000	0.002
	(0.003)	(0.005)	(0.005)	(0.009)
SFR filing Sq. $250-500$ ft.			-0.0019	-0.0051*
			(0.0022)	(0.0030)
Units RO MF filing $0-250$ ft., β_{MF}^{250}	0.001	-0.009*	0.005	-0.024***
	(0.005)	(0.005)	(0.009)	(0.007)
Units RO MF filing Sq. $0-250$ ft.			-0.0002	0.0009***
			(0.0004)	(0.0002)
Units RO MF filing $250-500$ ft., β_{MF}^{500}	-0.005	-0.008***	-0.001	-0.014***
	(0.004)	(0.002)	(0.005)	(0.004)
Units RO MF filing Sq. $250-500$ ft.			-0.0002	0.0004**
			(0.0004)	(0.0002)
N	60,002	33,287	60,002	33,287
Supply $0-250$ ft., $\beta_{SF}^{250}-\beta_{MF}^{250}$	-0.015**	-0.015	-0.016	0.010
	(0.007)	(0.009)	(0.010)	(0.012)
Supply $250-500$ ft., $\beta_{SF}^{500}-\beta_{MF}^{500}$	0.001	-0.006	-0.000	0.011
	(0.005)	(0.005)	(0.006)	(0.008)
Disamenity $0-250$ ft., β_{MF}^{250}	0.001	-0.009*	0.005	-0.023***
	(0.005)	(0.005)	(0.009)	(0.007)
Disamenity $250-500$ ft., β_{MF}^{500}	-0.005	-0.008***	-0.002	-0.014***
	(0.004)	(0.002)	(0.005)	(0.004)

Note: Eicker-White standard errors are reported in parentheses. All specifications include controls for the number of foreclosure filings for condo and multi-family owner-occupied properties. All specifications include indicator variables for whether there were any foreclosures between 1500 feet and 2000 feet of the property and for whether there were any foreclosures more than 2000 feet away from the property. All specifications include census tract effects and structure characteristics. See Table 3 note for description of structure characteristics. Supply and dis-amenity effects and standard errors reported in the bottom section of columns (3) and (4) are measured at one foreclosure. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.