Foreclosure Contagion and REO versus non-REO Sales

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Abstract

Using ZIP code-level data on foreclosure rates, distressed and non-distressed sales in Chicago, Illinois we examine the REO discount. We find significant differences in the difference in price between distressed and non-distressed properties in high- versus low-foreclosure rate neighborhoods. We expand this analysis to determine if trends in the REO discount can be explained by trends in foreclosure rates and if this correlation can be used to identify a 'tipping point' in foreclosure rates. We identify key relationships between trends in the REO discount, the proportion of REO sales to total sales and sales volume.

Keywords: REO, foreclosure, contagion

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Introduction

There have been a number of accounts in the mainstream media regarding foreclosures concentrated in particular neighborhoods or geographic regions. In some cases, a surge in foreclosures appears to have led to the demise of entire towns.[2] Given this anecdotal evidence, our primary research question is 'is there a tipping point in foreclosure rates above which the foreclosure rate increases at an increasing rate'? That is, is there some threshold in foreclosures above which a neighborhood or town may be considered at risk of failure?

This question is important because if we can identify such a tipping point and the factors that lead certain areas to reach that tipping point more quickly than others, then relief efforts and future crisis prevention efforts may be targeted appropriately.

Single-family foreclosure rates have increased significantly nationwide since 2007. Figure 1 shows this trend in Chicago, Illinois. Here, foreclosure rates across Chicago neighborhoods average 1.41% in the fourth quarter of 2006 and rise to 5.59% in the fourth quarter of 2008. Often, these foreclosures lead to a public auction where the lender purchases the home changing the status of the property to Real Estate Owned or REO. Ultimately, these properties are eventually sold – frequently at greatly reduced prices – and these sales are accounted for as REO sales. These distressed sales appear to have a negative impact on overall sales indices. Figure 2 shows this effect when REO sale prices per square foot are depicted separately from non-distressed sale prices in Chicago, Illinois. The median price per square foot for all properties in Chicago from 1999 to 2008 is $196.79, while, non-distressed properties sell

[2] See (Schwartz, 2007) for an anecdotal example of the neighborhood impact of foreclosure.

for a slightly higher price of $200.93/sq. ft. but distressed properties sell for much less at $115.11/sq. ft.

When we compare neighborhoods with high foreclosure rates to neighborhoods with low foreclosure rates, we find evidence that the neighborhoods with high foreclosure rates have a smaller gap between distressed and non-distressed prices than areas with low foreclosure rates. Figures 3 and 4 provide examples of high foreclosure rate neighborhoods versus low foreclosure rate neighborhoods and their corresponding price gaps. Figure 3 focuses on the five-digit ZIP code 60621. This is an inner-city neighborhood on the Southside of Chicago near the University of Chicago. Here, the average foreclosure rate is 6.72% across the period from 2003 to 2008. Figure 3 shows the price gap between REO and non-REO properties over the 10-year period from 1999 to 2008 in this Southside neighborhood. This gap averages $28.48 per square foot. At the other end of the spectrum, Figure 4 depicts the five-digit ZIP code 60647. This is an upper scale neighborhood called Bucktown. Here, the average foreclosure rate is 0.67% across the period from 2003 to 2008. Figure 4 shows the price gap between REO and non-REO properties over the 10-year period from 1999 to 2008 in Bucktown. Due to the low volume of REO sales, there are some periods where there is no REO sales price data. However, the average price gap in the periods where there are both distressed and non-distressed sales is $90.39 per square foot.

We argue that this difference in the size of this price gap – which is referred to as the REO discount – is indicative of foreclosure contagion and its impact on home values. Further, we argue that close examination of the trend in the REO discount in a particular neighborhood is useful to determine a tipping point in foreclosure. We maintain that REO discounts are high when foreclosure rates are low because distressed sales are an unusual phenomenon that justifies

a significant market discount. However, when foreclosure rates are high, distressed sales are more commonplace and do not require large REO discounts in order for the properties to be sold. It should follow that when foreclosure rates increase due to contagion, there should be a point when the REO discount begins to fall due to market saturation. i.e. a distressed sale becomes more the norm than an anomaly. We argue that the point at which the rate of change in the REO discount reverses is the tipping point in foreclosure rates.

The section that follows reviews the relevant literature in this area. The next section describes the data and methodology that we use to test our hypotheses. We conclude with a presentation and discussion of our results.

Review of the Literature

Our examination of foreclosure focuses on the impact of foreclosure on individual neighborhoods. Our specific focus is on foreclosure density as compared to the price gap between distressed and non-distressed sales. A growing body of work examines the neighborhood effects of foreclosure from various perspectives[3]. Much of that work focuses on the price/value impact of foreclosed properties on neighboring homes. Other work examines 'real estate owned' or REO properties which have been repossessed by banks.

With regard to price effects, research in this area provides evidence that the price or value impact of neighboring foreclosures is anywhere from 1% to 10% or about $5,000 on average. Immergluck and Smith (2006) find that each conventional foreclosure within an eighth of a mile of a single-family home results in a decline of 0.9 percent in value. Leonard and Murdoch (2008) estimate the direct effect of an increase in foreclosures is between $1,320 and $2,020, and

[3] See Miller, Rauterkus and Sklarz (2008) for a detailed description of current foreclosure research.

the spatial reach of this impact is 250 feet. The Center for Responsible Lending estimates that 40.6 million neighboring homes will experience devaluation because of subprime foreclosures that take place nearby. This decline, the CRL estimates, is valued at $202 billion. This translates into a $5,000 decline on average for a homeowner living near a foreclosed property. Lin, Rosenblatt and Yao (forthcoming) find that the spillover effect results in as much as a 9.7% discount in home prices for homes located within a 0.1 km (300 feet) radius from a foreclosed property. Further, they find that the spillover effect is always significant for distances within 0.9 km (3,000 feet). Rogers and Winter (2008) find a foreclosure effect of as much as 5.3% at 100 yards and six months. They find that the negative impact of foreclosures does extend at least 400 yards and 18 months. They do not, however, find evidence of a 'tipping point,' where at some point sales decline rapidly. Instead, they find evidence of a diminishing marginal effect of foreclosure – the opposite effect. Harding, Rosenblatt and Yao (2008) find evidence that nearby distressed properties have significant negative contagion effects over and above the overall trend in house prices of approximately 1% to 1.5% per foreclosure. They find three things: 1) the foreclosure effect is greater, the longer it takes to sell the foreclosed property; 2) it peaks at the time of the REO sale; and 3) it lingers beyond the REO sale. Calomiris, Longhofer and Miles (2008) find that the impact of foreclosure on prices is negative and significant, but small in magnitude. The authors estimate that the national average price decline for houses from second quarter 2007 to fourth quarter 2009 will be approximately 5.5 percent. Further, they conclude that the future path of housing prices will be flat for the next two years.

REO research provides evidence that foreclosures are concentrated in the inner city and in certain states. The ICIC (2008) provides statistics indicating that .63% of housing units in the inner city are REOs versus .31% in the rest of the United States. Further, the paper reports that

there are 9.2 REOs per square mile in the inner city compared with 0.2 REOs per mile in the rest of the United States. The ICIC finds the highest REO rates in Detroit, Cleveland, Atlanta, Indianapolis and Akron – all with over 1.5% of owner-occupied housing units in REO. We obtained current foreclosure data from the Federal Reserve Bank of New York in order to extend the ICIC analysis of REO rates. The data suggests that the subprime foreclosure fallout is very concentrated. We see this concentration by state and within states and within cities. We see 75% of the subprime foreclosures in only 12 states.[4]

Data

We focus our study on Chicago, IL. We use a dataset from LPS Analytics that contains loan-level data provided by mortgage servicers. This dataset contains both static and dynamic variables related to these loans at origination (static variables) and as of specific points in time (dynamic variables). We obtain a sample of all Chicago mortgages in the dataset as of January 2003 through December 2008. We also use a dataset from Collateral Analytics that contains ZIP code-level sales data for distressed (REOs and short sales) and non-distressed sales in the city of Chicago from 1999 through 2008.

Using the loan-level dataset, we calculate monthly foreclosure rates by five-digit ZIP code for all three cities. We calculate foreclosure rates as $\frac{\#\ of\ loans\ in\ foreclosure}{\#\ of\ loans\ in\ the\ dataset}$ for each ZIP code. From our ZIP code-level sales data, we calculate average sales price per square foot by ZIP code and by quarter. We also calculate the proportion of distressed (REO) sales to total sales by ZIP code and by quarter.

[4] These 12 states are California, Florida, Texas, New York, Michigan, Ohio, Illinois, Pennsylvania, Georgia, Arizona, Indiana and New Jersey.

Table 1 describes our data. We notice a marked difference in the trends from 2003 – 2005 versus the trends from 2006 – 2008. The REO discount, proportion of distressed sales and foreclosure rates increased steadily in the latter period, while these trends tended to decline in the earlier subperiod. Also, we see a significant difference in the size of the REO discount after taking sales volume into consideration to yield a sales-weighted REO discount. The discount tends to be more than 10% higher after accounting for sales volume. However, this trend too is differs across the two subperiods. The sales-weighted REO discount is 14% higher on average than the non-sales-weighted REO discount from 203-2005 while it is less than 8% higher during the period from 2006 – 2008.

Methodology

Using this data, we test for the contagion effect. Our hypothesis is that in markets dominated by foreclosures, all homes are affected and non-distressed sales will be discounted the same as distressed sales. However, in markets with fewer foreclosures, we should see larger gaps in pricing. That is, the greater the density and number of foreclosures within a ZIP code, the less will be the gap between the pricing of distressed and non-distressed sales. We hypothesize that in markets with a lot of foreclosures, all properties are contaminated, even if they are not distressed sales.

Specifically, we test the following hypotheses:

H_1: The REO discount increases with the proportion of sales that are distressed in a given area up to a saturation point after which the discount reverses.

H_2: Increases in foreclosure rates lead REO sales.

H_3: The REO discount increases as sales volume decreases.

We can then find the tipping point by graphing the density or percentage of properties in a ZIP in foreclosure against the gap in pricing. Graphically, the tipping point is the point at which foreclosure rates begin to increase at an increasing rate. By examining other data simultaneously and confirming a relationship between these phenomena and foreclosure rates, we can determine the point at which other economic conditions can produce this tipping point. We limit our focus to the REO discount and the proportion of REO sales to total sales.

To confirm the relationship between foreclosure rates and the REO discount, we estimate a time series regression. We model it as $LN\_foreclosure\_rate = \alpha + \beta REO\_Discount$ where LN_foreclosure_rate = the natural log of the proportion of foreclosures in a ZIP code and REO_discount = the difference between average distressed sales prices and average non-distressed sales prices.

To further define the point at which there is a significant change in the foreclosure rate acceleration, we estimate the logistic equation $Y^* = a + bX$ where $Y^* = \ln(K/Y - 1)$, K is an asymptote that represents the maximum realistic value for Y, X is an explanatory variable (REO discount or proportion of REO sales) and Y is the foreclosure rate. After estimating the parameters for a and b, we insert these values into our original regression equation and calculate its first and second derivatives. After setting the second derivative equal to zero, we find a value for X which can be identified as the foreclosure rate tipping point.

Results

We separate the ZIP codes in our sample into quartiles based on the average foreclosure rate across the sample period. Figure 5 compares the REO discount in the quartile with the highest foreclosure rates to the REO discount in the quartile with the lowest foreclosure rates. In

most periods, the REO discount is higher in the low foreclosure rate neighborhoods with four brief periods where the two trend lines cross. We conduct a t-test to determine if there is a significant difference in the average REO discounts in high- and low-foreclosure rate areas. The results of this t-test are shown in Table 2. The t-statistic of -4.30 (and p-value of 0.00) indicates that the average REO discount in high foreclosure rate ZIPs is significantly lower than the average REO discount in low foreclosure rate ZIPs. The t-test also reveals that the volatility of the REO discount in high foreclosure rate ZIPs is nearly six times the volatility in low foreclosure rate ZIPs.

After finding evidence that the REO discount is higher for low foreclosure rate neighborhoods than for low foreclosure rate neighborhoods, we test our first hypothesis that this relation leads to a trend reversal in the REO discount as foreclosure rates increase above a certain level.

A depiction of the results of H_1 is shown in Figure 6. This figure shows – particularly after 2005 – that the REO discount increases with the proportion of REO sales to total sales. Over time, this discount fluctuates considerably – ranging from just over 1% to just under 70%. As noted in the descriptive statistics, the sales-weighted REO discount tends to be higher than the non-sales-weighted REO discount over time. However, this difference lessens after 2005 and the sales-weighted REO discount even dips below the non-sales-weighted REO discount at the end of 2008. What is not clear from Figure 6 is a reversal in the REO discount although a trend reversal does appear to be evident in the proportion of REO sales. We therefore conducted further analysis of the nature of the relationship between the REO discount and the proportion of REO sales. Figure 7 shows a scatter plot of our entire sample of data. Here, we do not see evidence of a non-linear relationship between these two factors. Due to the extreme differences

in market conditions after 2005, we separated our sample into two subsets. The first subset includes observations through December 2005 and the second subset includes only observations after 2005. Figure 8 is a scatter plot of the post-2005 subsample. Here, the relationship between the two variables appears to be much the same as in the full sample.

Despite the persistence of a linear trend in the data, we considered the possibility of a logistic relationship between the REO discount and the proportion of REO sales. The results of our logistic regressions are shown in Table 3. A graph of these results for a range of values of the proportion of REO sales, is shown in Figure 9. Again, we do not see clear inflection points indicating a reversal in the REO discount at some level of REO sales.

In our second hypothesis, we propose that increases in foreclosure rates lead REO sales. Figure 10 shows the trend in foreclosure rates from 2003 to 2008. Here we notice that average foreclosure rates in Chicago hit a peak in the third quarter of 2007 and then experienced two consecutive quarters of decline followed by a sharp upswing in late 2008. Visual analysis indicates that a change in the acceleration rate in foreclosure appears to occur in the third quarter of 2008. We conduct time-series regression analysis to determine the extent to which foreclosures lead REO sales. The results of those regressions are shown in Table 4. After testing one-, two- and three- period lags, we find evidence that foreclosure rates lead REO sales by one period.

Finally, we consider the relationship between the REO discount and sales volume. We hypothesize an inverse relationship indicating that the REO discount is larger in thinner housing markets. Figure 11 shows the trends in REO discount compared to sales volume. Here, we see that in times that the REO discount is high, sales volume is lower as in the period prior to 2004 and the period after 2005. Also, we see that at times when the REO discount is low, sales

volume is higher – as in the period from 2004 to 2005. We estimate a time-series regression to further understand the relationship between the REO discount and sales volume. The results of those regressions are shown in Table 5. As expected, the sign of the coefficient for lnsalesvolume is negative in all periods. These results are strongest in the period prior to 2006.

Discussion and Conclusions

In our first hypothesis we propose that the REO discount increases with the proportion of sales that are distressed in a given area but that once the market reaches a saturation point, this trend reverses and the REO discount declines. While we do find evidence that the REO discount is high when foreclosure rates are low and vice versa, we do not find evidence of a reversal. There may be a number of explanations for this. We discuss two strong possibilities here. First, this type of trend reversal may only occur under the most extreme circumstances. In the Chicago market, the ZIP code with the greatest difference between the lowest and highest periodic foreclosure rate posted a difference of over 8%. While an eight percentage point shift in foreclosure rates appears to be significant, the lowest foreclosure rate for this ZIP code during the sample period is over 3%. Given such a high starting point, it may be that this is a case of a 'bad' neighborhood simply getting worse. Our hypothesis seeks to explain the case of a 'good' neighborhood that turns into a 'bad' neighborhood due to foreclosure contagion. Our sample does not appear to have any such cases.

Second, our foreclosure rate data covers the period from 2003 to 2008. Foreclosure rates begin to spike in late 2006 and early 2007. At the end of 2008, average foreclosure rates in Chicago are continuing to climb. The only trend reversals we see are in the proportion of REO sales to total sales. Given the extreme nature of the relationships we seek to verify, we may need

more data to conduct a thorough analysis. That is, we may not find a reversal in the REO discount because that reversal has not yet occurred in the Chicago market.

We also hypothesize that increases in foreclosure rates increases in REO sales. While this hypothesis is intuitively reasonable due to the chain of events associated with foreclosure proceedings, REO and REO sales, it is important to quantify this lead time in order to attempt to forecast future trends. We find evidence that foreclosures lead REO sales by one to two periods. Given that our dataset is quarterly, this equates to three to six months. Thus, we find that on average, it takes three to six months for a distressed property to move from foreclosure to REO to final sale.

Finally, we hypothesize that ceteris paribus the REO discount must be higher in thinner markets. That is, the sales price on distressed properties must be lowered in markets where sales are soft. Thus, the REO discount is high when the sales volume is low and vice versa. We do find evidence of this inverse relationship between the REO discount and sales volume.

Our results provide evidence that foreclosure contagion is raging but not in all submarkets. It is highly concentrated. Loan modifications will not do much without significant mortgage principal reduction and mortgage rate reductions. This can only be accomplished by significant subsidy or a trade-off providing shared appreciation to third party investors in exchange for buying down part of the mortgage. The results of our study of foreclosure contagion may provide direction for these intervention programs.

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Table 1. Descriptive Statistics

This table describes the data used in our study of 57 unique ZIP codes in Chicago, Illinois.

	2003	2004	2005	2006	2007	2008
All Sales $/sq. ft.	180.37	199.44	226.61	254.45	263.39	232.09
% Change in all sales $/sq. ft.	8.31	10.57	13.63	12.28	3.51	-11.88
Regular price/sq. ft.	184.37	202.64	222.62	256.12	266.93	246.85
% Change in regular $/sq. ft.	9.12	9.91	9.86	15.05	4.22	-7.52
Distressed $/sq. ft.	95.19	117.31	160.60	169.30	156.50	128.82
% Change in $/sq. ft.	23.85	23.24	36.90	5.42	-7.56	-17.69
REO discount ($)	89.18	85.34	62.02	86.82	110.42	118.03
REO discount (%)	48.37	42.11	27.86	33.90	41.37	47.81
% Change in REO discount	-3.17	-4.31	-27.32	39.99	27.18	6.89
Sales-Weighted REO discount ($)	107.70	100.84	91.48	93.46	107.87	113.63
Sales-Weighted REO discount (%)	61.56	54.49	44.93	42.74	48.11	54.81
% Change in Sales-Weighted REO discount	-4.94	-11.48	-17.54	-4.88	12.57	13.92
Regular sales volume	13,841	17,505	20,205	15,635	10,134	5,616
% Change in regular sales volume	4.00	26.47	15.42	-22.62	-35.18	-44.58
Distressed sales volume	1,067	1,095	967	762	932	1,728
% Change in distressed sales volume	21.39	2.62	-11.69	-21.20	22.31	85.41
Proportion of distressed sales to total sales	7.16	5.89	4.57	4.65	8.42	23.53
% Change in proportion of distressed sales	15.53	-17.75	-22.42	1.75	81.23	179.37
Foreclosure rate(%)	1.82	1.88	1.05	1.32	2.91	5.53
% Change in foreclosure rate		2.89	-44.12	25.50	121.32	90.01

Table 2. Difference in Mean REO Discount

	High Foreclosure Rate ZIPs	*Low Foreclosure Rate ZIPs*
Mean	0.18372	0.379548
Variance	0.068433	0.012151
Observations	34	34
Pearson Correlation	0.176914	
Hypothesized Mean Difference	0	
df	33	
t Stat	-4.30417	
P(T<=t) one-tail	7.04E-05	
t Critical one-tail	1.69236	
P(T<=t) two-tail	0.000141	
t Critical two-tail	2.034515	

Table 3. Logistic Regression Results

The dependent variable in all regressions is REO discount.

	Full Sample	*Pre-2006 Sub-Sample*	*Post-2005 Sub-Sample*
Propreo	-2.2837 (-7.17)***	-2.9752 (-4.91)***	-2.5662 (-6.31)***
Constant	0.5633 (9.80)***	0.5080 (6.55)***	0.7592 (8.19)***
N	982	537	445
R^2	0.0498	0.0432	0.0825

Table 4. Panel Regression Results

The dependent variable in all regressions is REO discount.

	Model 1	*Model 2*	*Model 3*
	Panel A: Full Sample		
Lnfratelead1	0.0538 (3.71)***		
Lnfratelead2		0.0293 (1.96)*	
Lnfratelead3			0.0056 (0.37)
Constant	0.2673 (10.72)***	0.2663 (10.39)***	0.2650 (10.35)***
N	709	702	690
Wald χ^2	13.74***	3.85**	0.14
R^2	0.0513	0.0342	0.0248
	Panel B: Pre-2006 Sub-Sample		
Lnfratelead1	0.0805 (3.08)***		
Lnfratelead2		0.0586 (2.25)**	
Lnfratelead3			0.0491 (1.90)*
Constant	0.3120 (9.50)***	0.3112 (9.32)***	0.3410 (9.91)***
N	354	381	333
Wald χ^2	9.48***	5.05**	3.62*
R^2	0.0453	0.0398	0.0622
	Panel C: Post-2005 Sub-Sample		
Lnfratelead1	0.0925 (4.42)***		
Lnfratelead2		0.0843 (3.65)***	
Lnfratelead3			0.0291 (1.73)*
Constant	0.2127 (7.96)***	0.1973 (6.79)***	0.2554 (11.71)***
N	355	321	388
Wald χ^2	19.51***	13.35***	3.00*
R^2	0.0833	0.0661	0.0155

Table 5. REO Discount and Sales Volume

The dependent variable in all regressions is REO discount.

	Full Sample	*Pre-2006 Sub-Sample*	*Post-2005 Sub-Sample*
Lnsalesvolume	-0.0513 (03.65)***	-0.0609 (-2.76)***	-0.0447 (-2.57)***
Constant	0.4966 (8.61)***	0.5532 (5.75)***	0.4641 (6.93)***
N	1,114	609	505
Wald χ^2	13.34***	7.64***	6.62**
R^2	0.0099	0.0188	0.0051

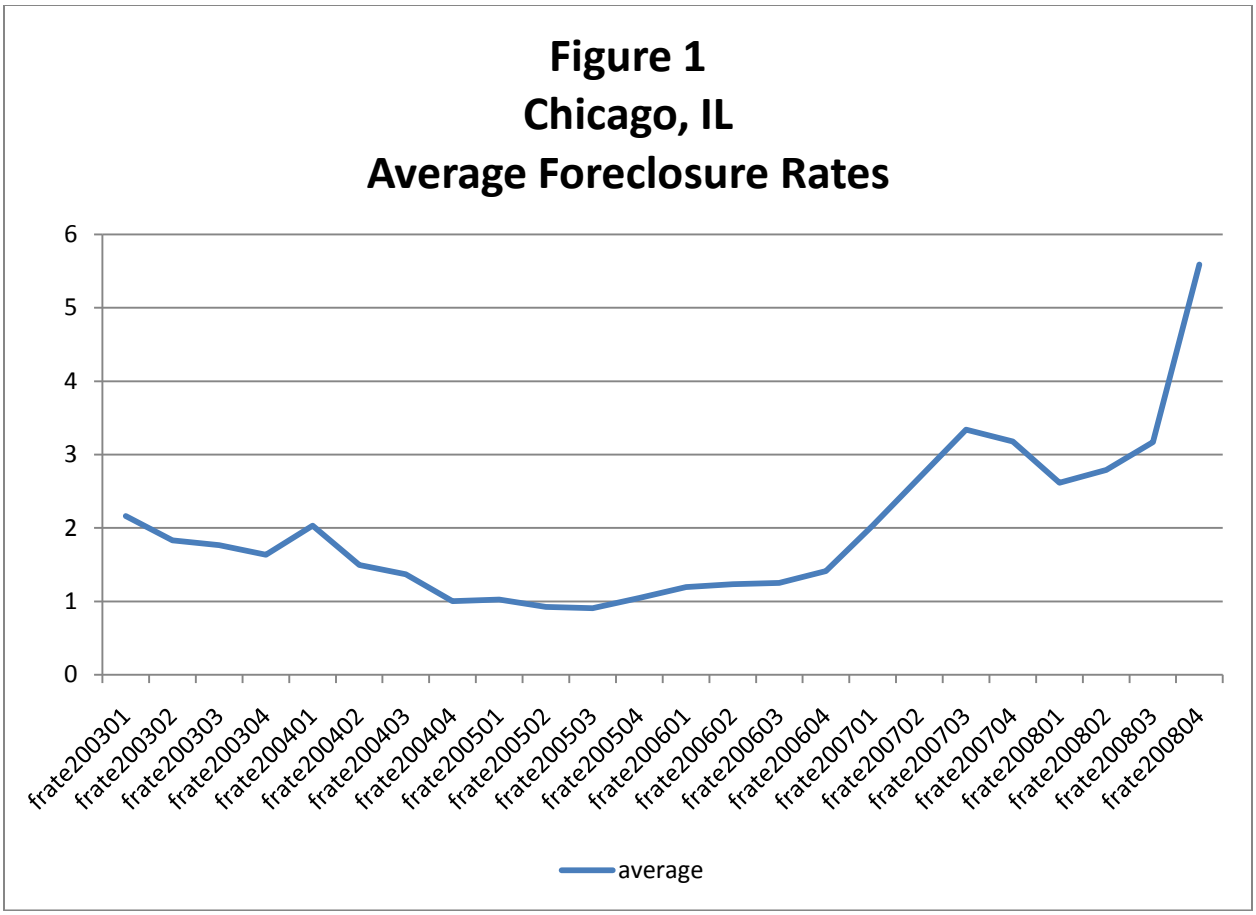
Figure 1
Chicago, IL
Average Foreclosure Rates
6
5
4
3
2
1
0
frate200301
frate200302
frate200303
frate200304
frate200401
frate200402
frate200403
frate200404
frate200501
frate200502
frate200503
frate200504
frate200601
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frate200804
average

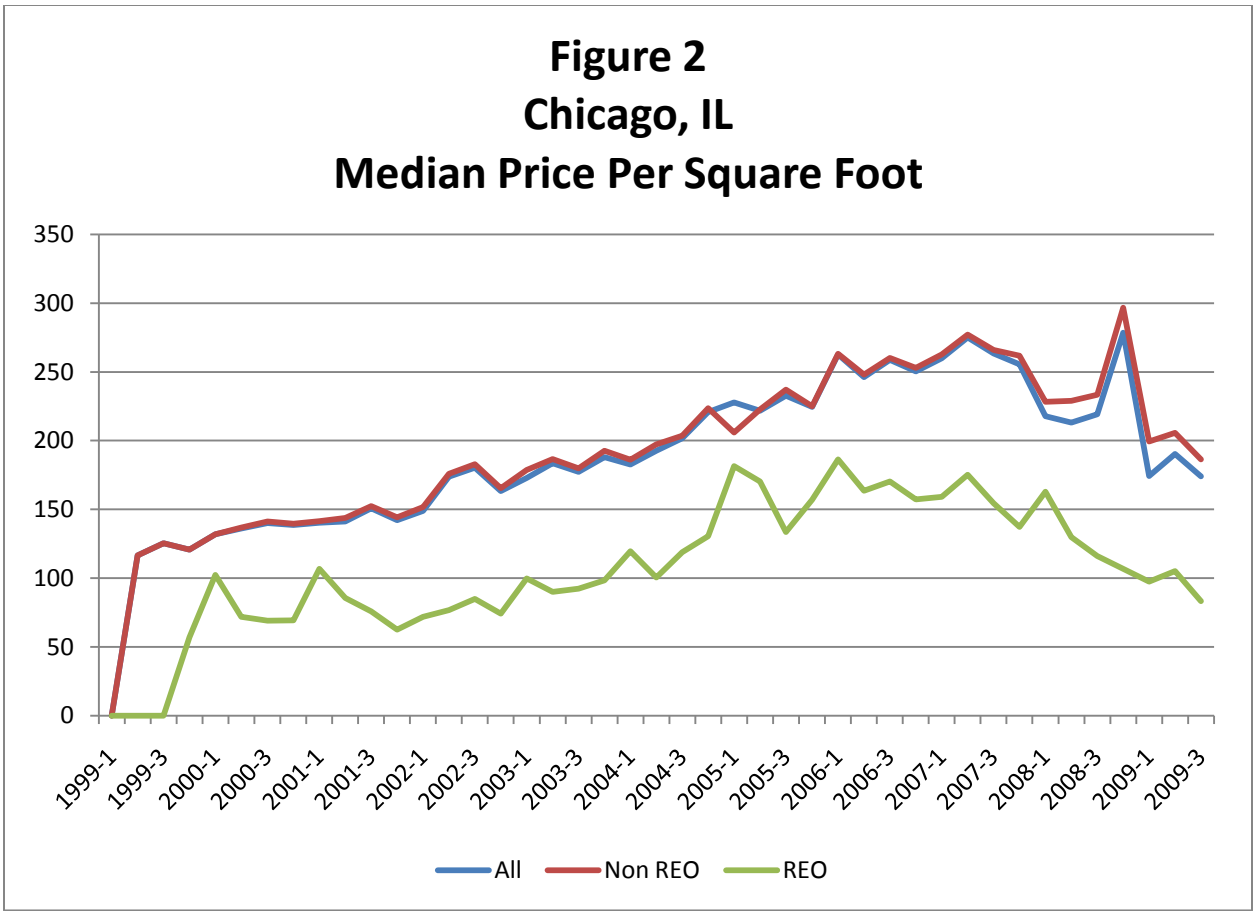
Figure 2
Chicago, IL
Median Price Per Square Foot
350
300
250
200
150
100
50
0
1999-1
1999-3
2000-1
2000-3
2001-1
2001-3
2002-1
2002-3
2003-1
2003-3
2004-1
2004-3
2005-1
2005-3
2006-1
2006-3
2007-1
2007-3
2008-1
2008-3
2009-1
2009-3
All
Non REO
REO

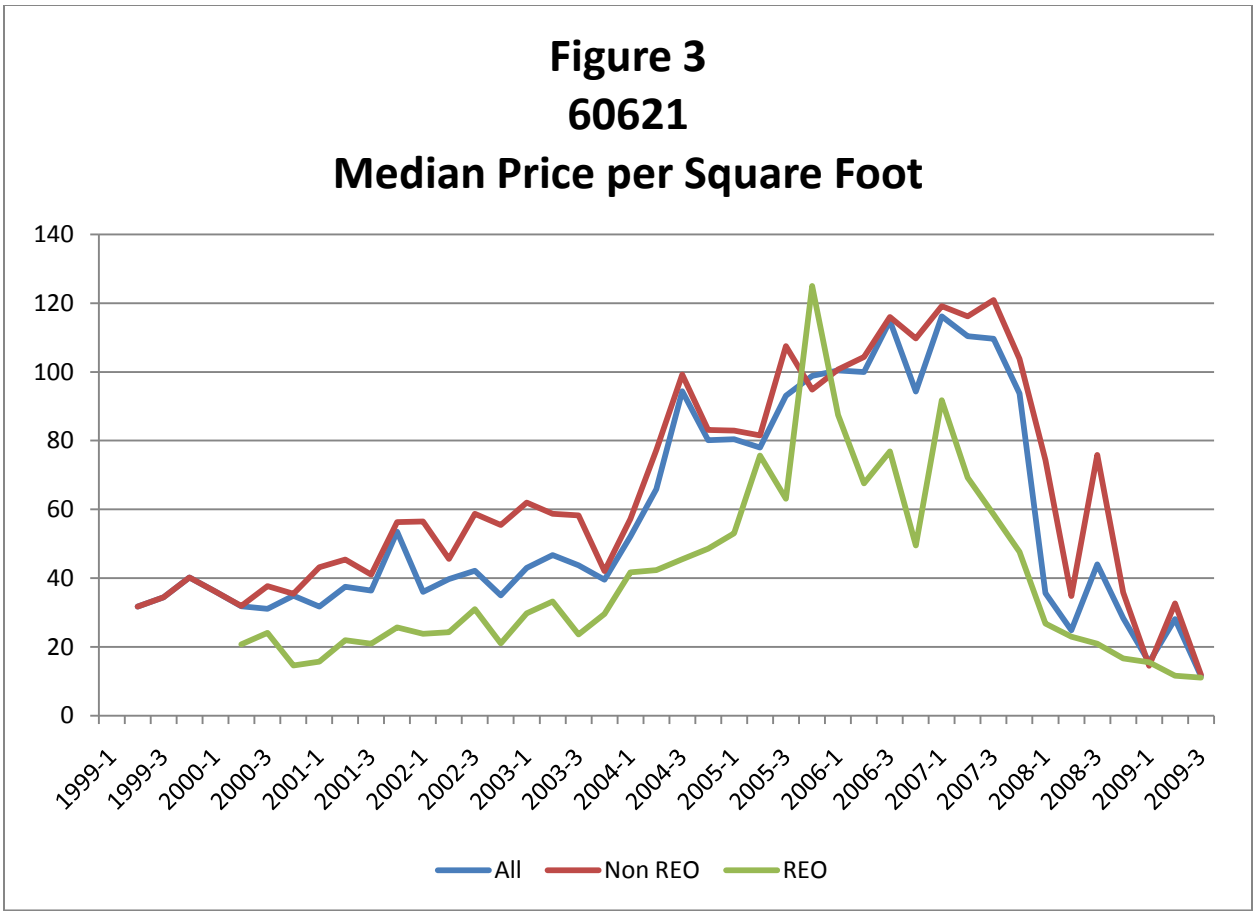
Figure 3
60621
Median Price per Square Foot
140
120
100
80
60
40
20
0
1999-1
1999-3
2000-1
2000-3
2001-1
2001-3
2002-1
2002-3
2003-1
2003-3
2004-1
2004-3
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2007-1
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2008-1
2008-3
2009-1
2009-3
All
Non REO
REO

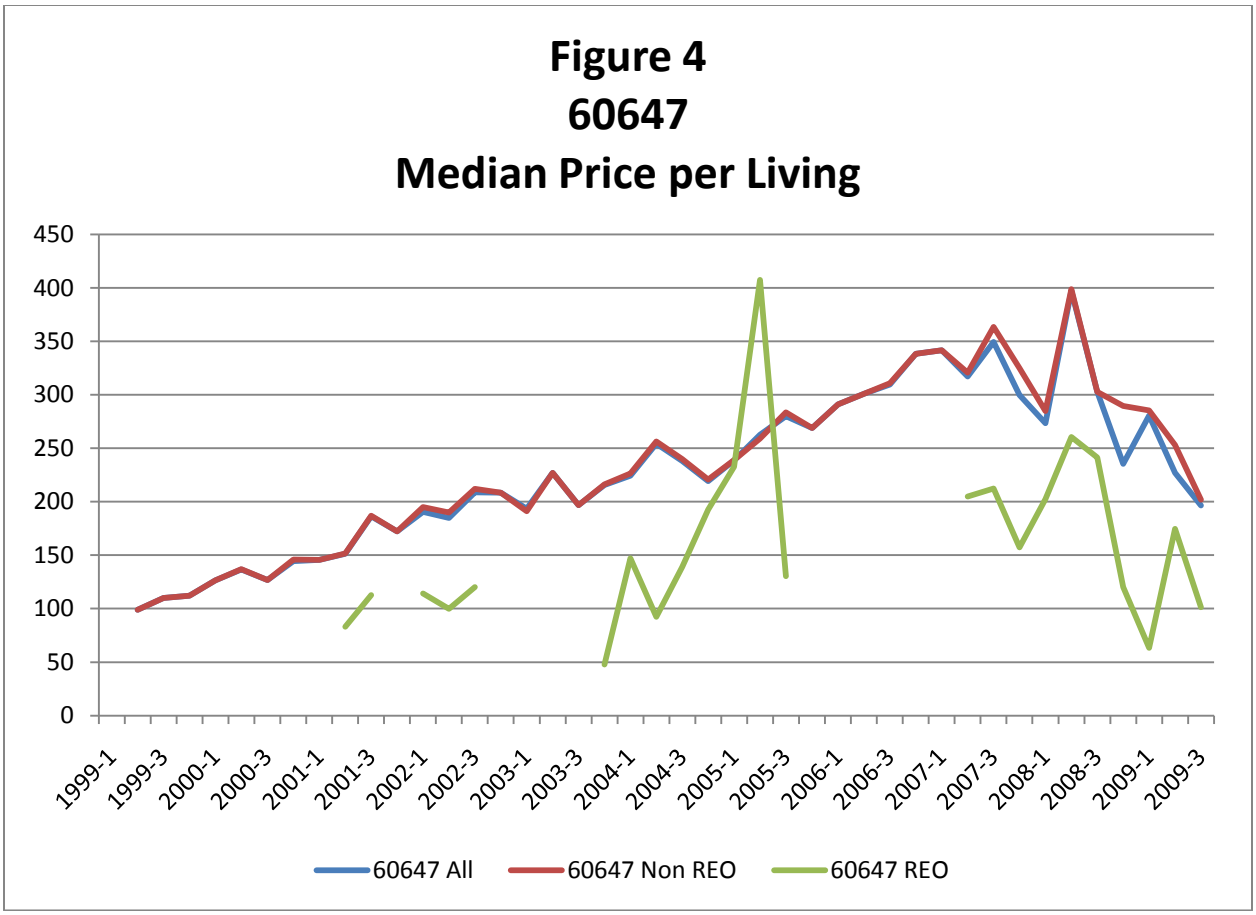
Figure 4
60647
Median Price per Living
450
400
350
300
250
200
150
100
50
0
1999-1
1999-3
2000-1
2000-3
2001-1
2001-3
2002-1
2002-3
2003-1
2003-3
2004-1
2004-3
2005-1
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2009-1
2009-3
60647 All
60647 Non REO
60647 REO

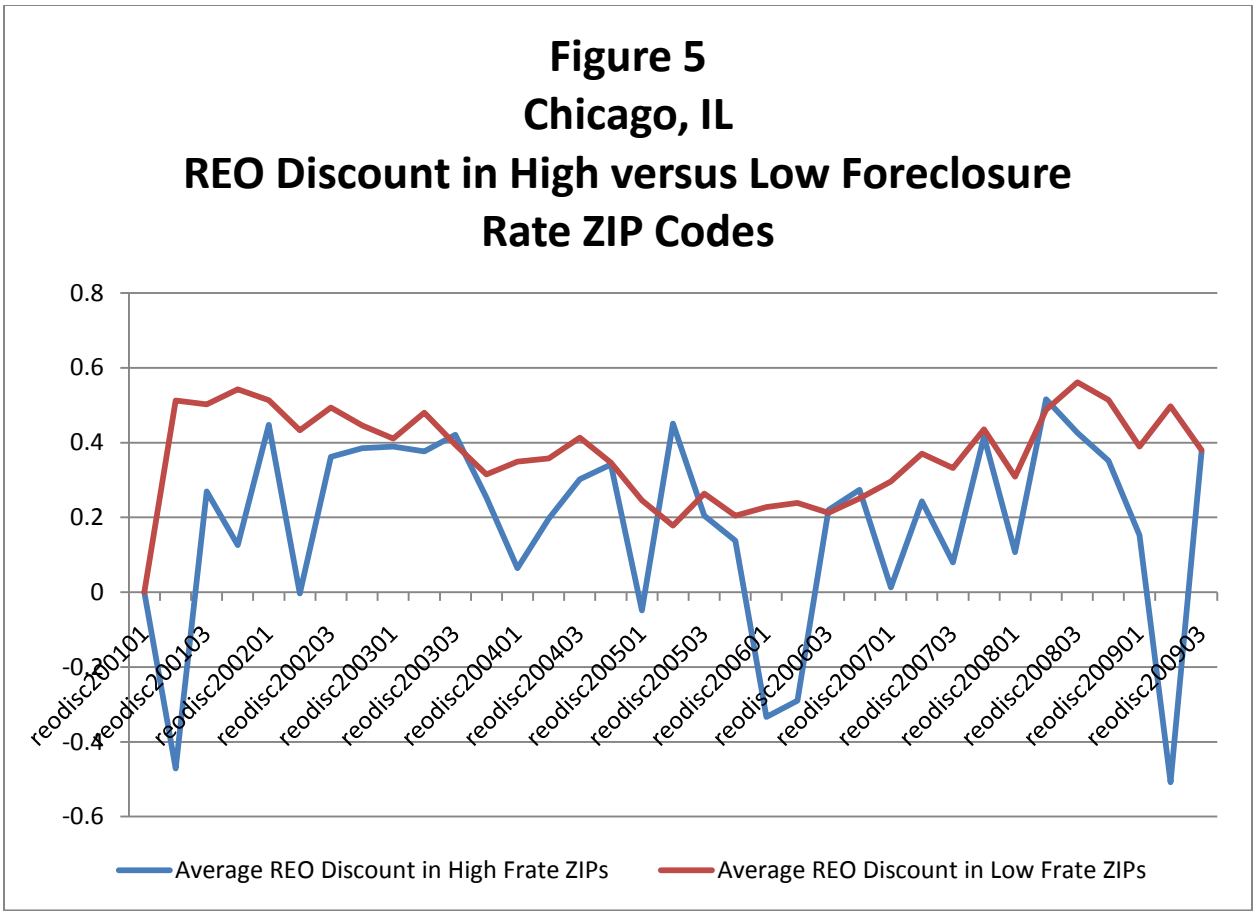
Figure 5
Chicago, IL
REO Discount in High versus Low Foreclosure Rate ZIP Codes
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
reodisc200101
reodisc200103
reodisc200201
reodisc200203
reodisc200301
reodisc200303
reodisc200401
reodisc200403
reodisc200501
reodisc200503
reodisc200601
reodisc200603
reodisc200701
reodisc200703
reodisc200801
reodisc200803
reodisc200901
reodisc200903
Average REO Discount in High Frate ZIPs
Average REO Discount in Low Frate ZIPs

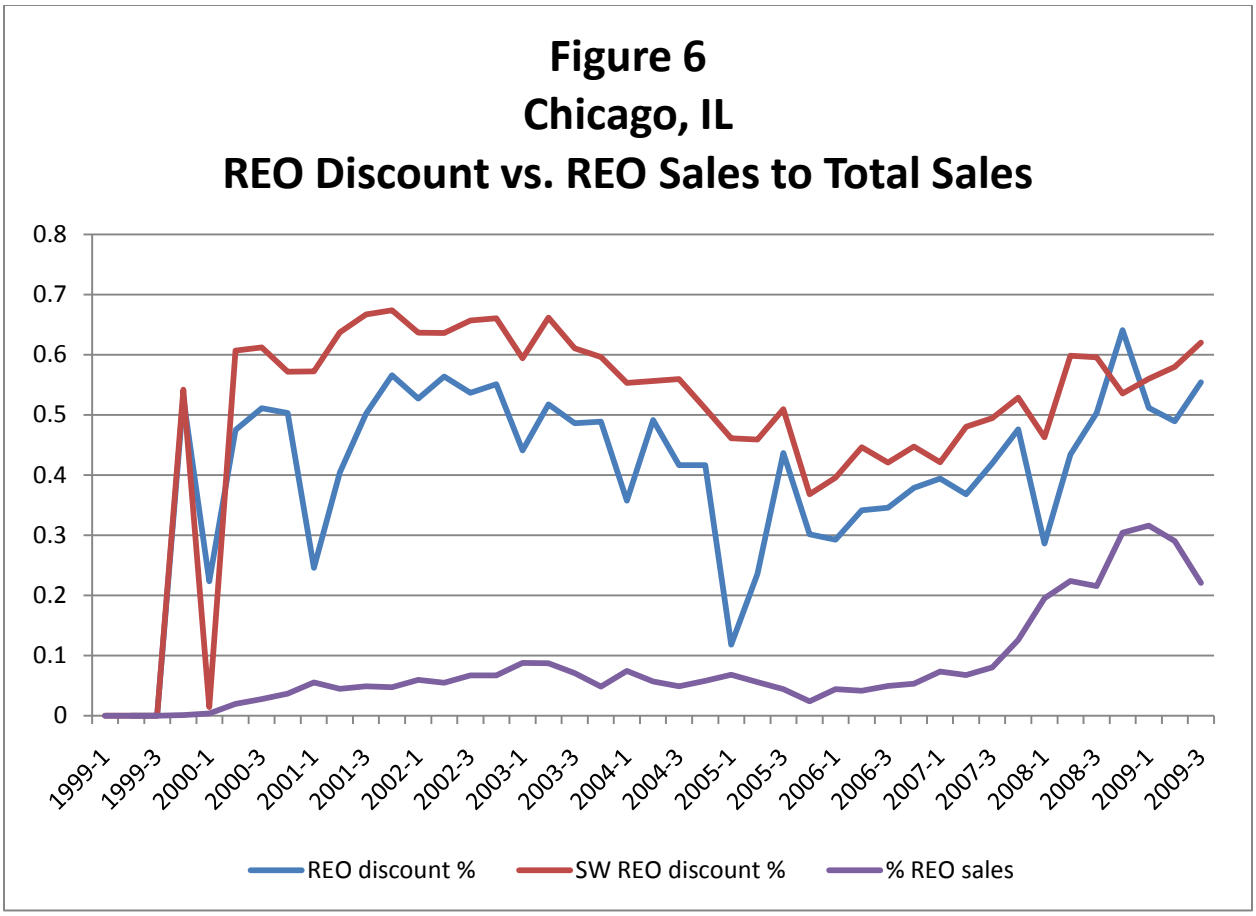
Figure 6
Chicago, IL
REO Discount vs. REO Sales to Total Sales
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1999-1
1999-3
2000-1
2000-3
2001-1
2001-3
2002-1
2002-3
2003-1
2003-3
2004-1
2004-3
2005-1
2005-3
2006-1
2006-3
2007-1
2007-3
2008-1
2008-3
2009-1
2009-3
REO discount %
SW REO discount %
% REO sales

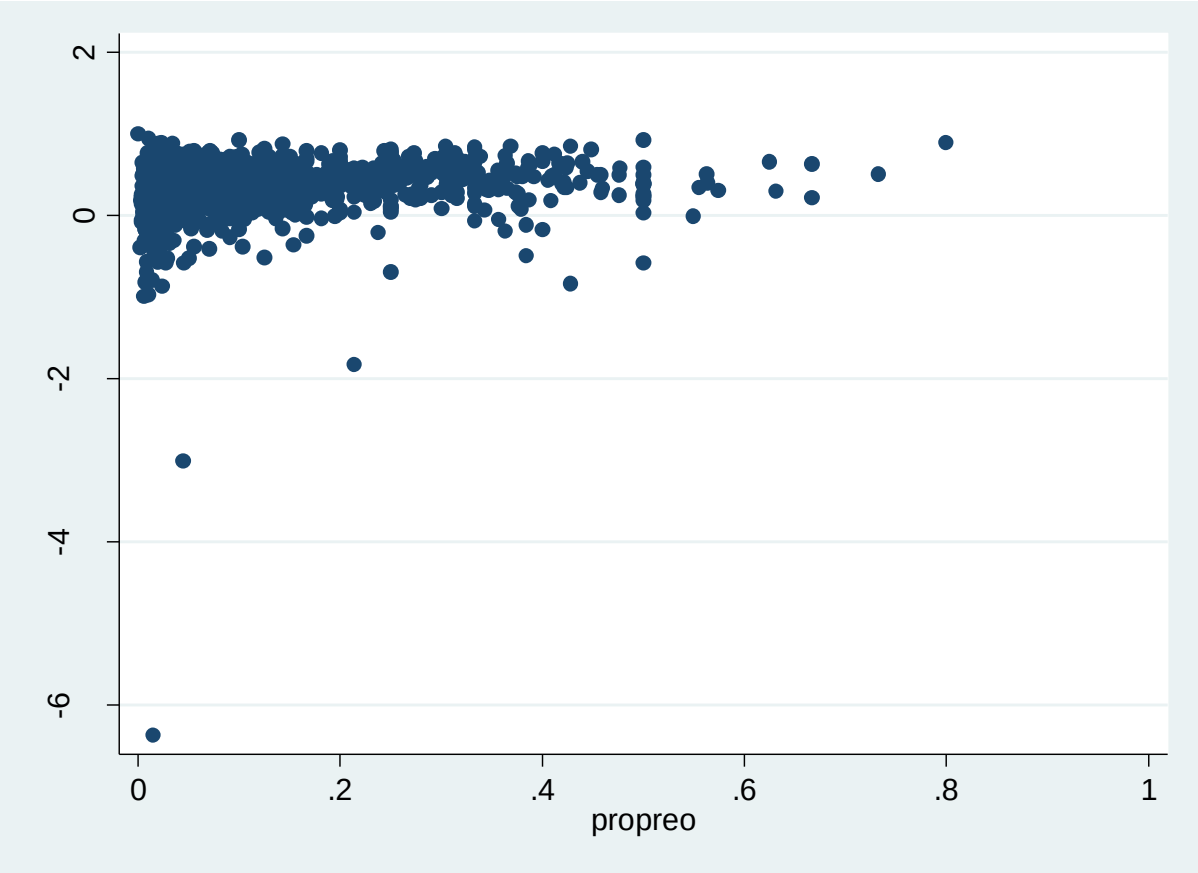

Figure 7 Relationship Between REO Discount and Proportion of REO Sales to Total Sales (Full Sample)

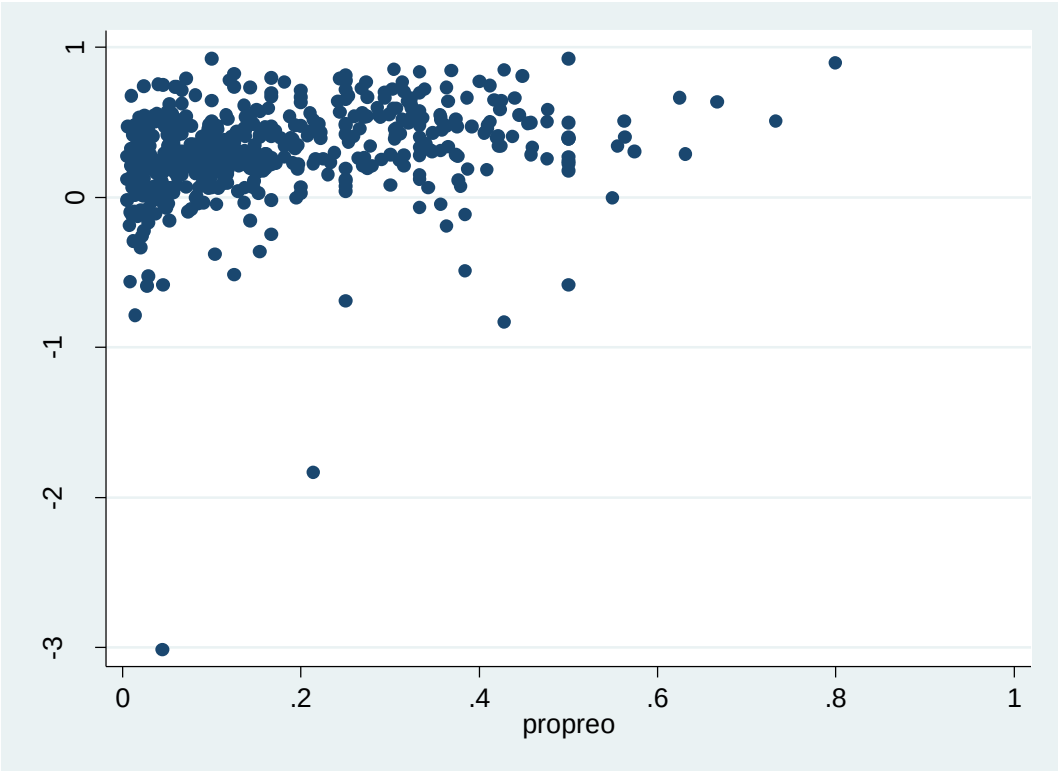

Figure 8 Relationship Between REO Discount and Proportion of REO Sales (after 2005)

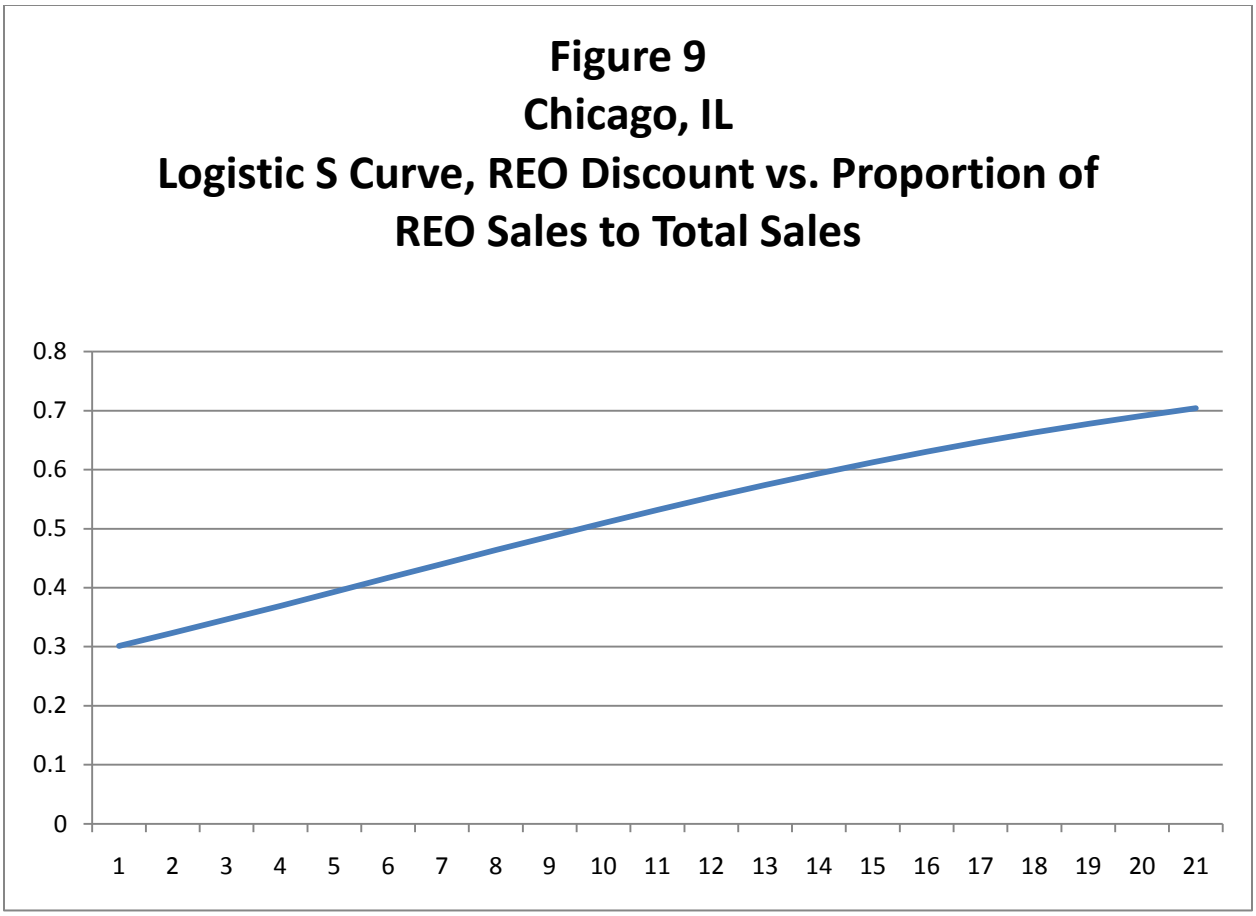
Figure 9
Chicago, IL
Logistic S Curve, REO Discount vs. Proportion of REO Sales to Total Sales
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21

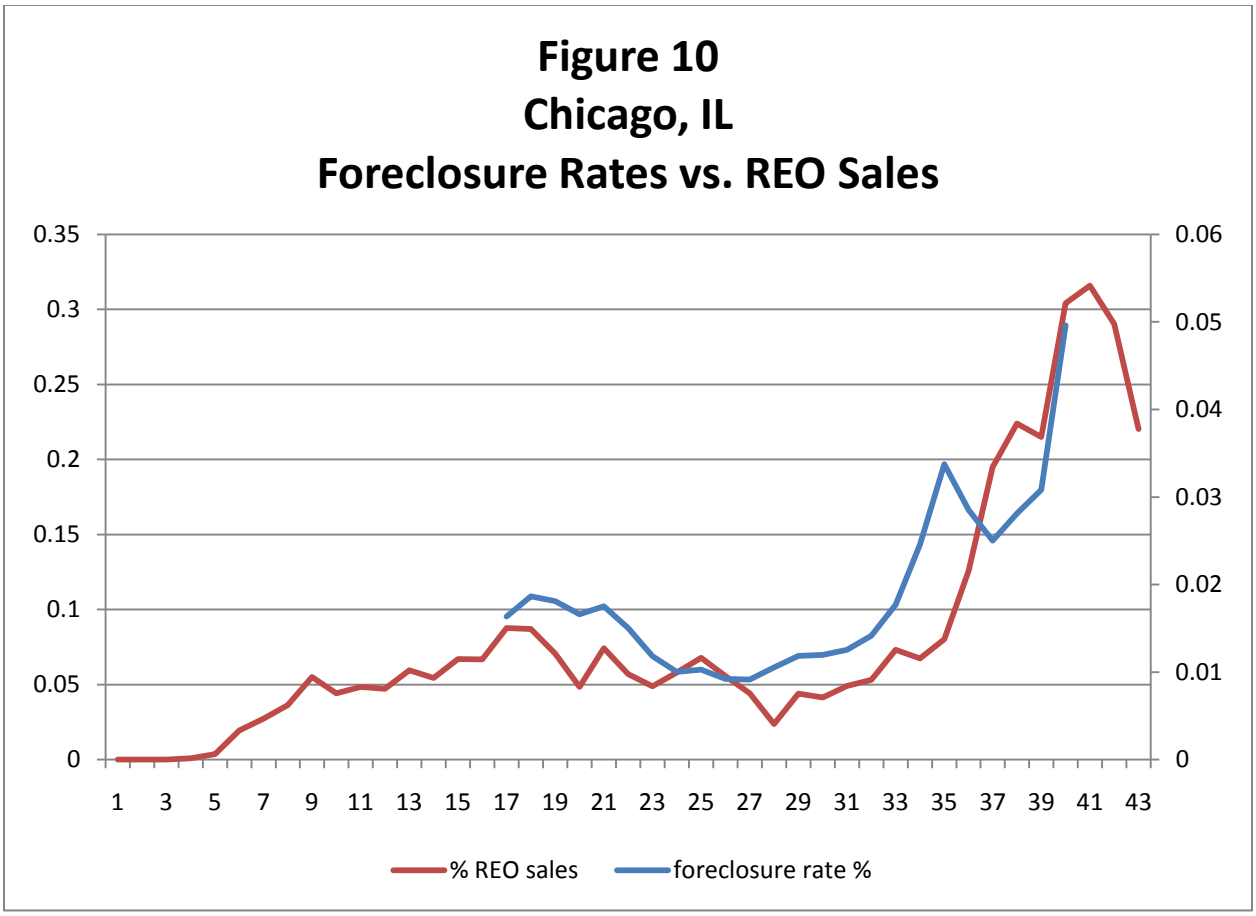
Figure 10
Chicago, IL
Foreclosure Rates vs. REO Sales
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0.06
0.05
0.04
0.03
0.02
0.01
0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43
% REO sales
foreclosure rate %

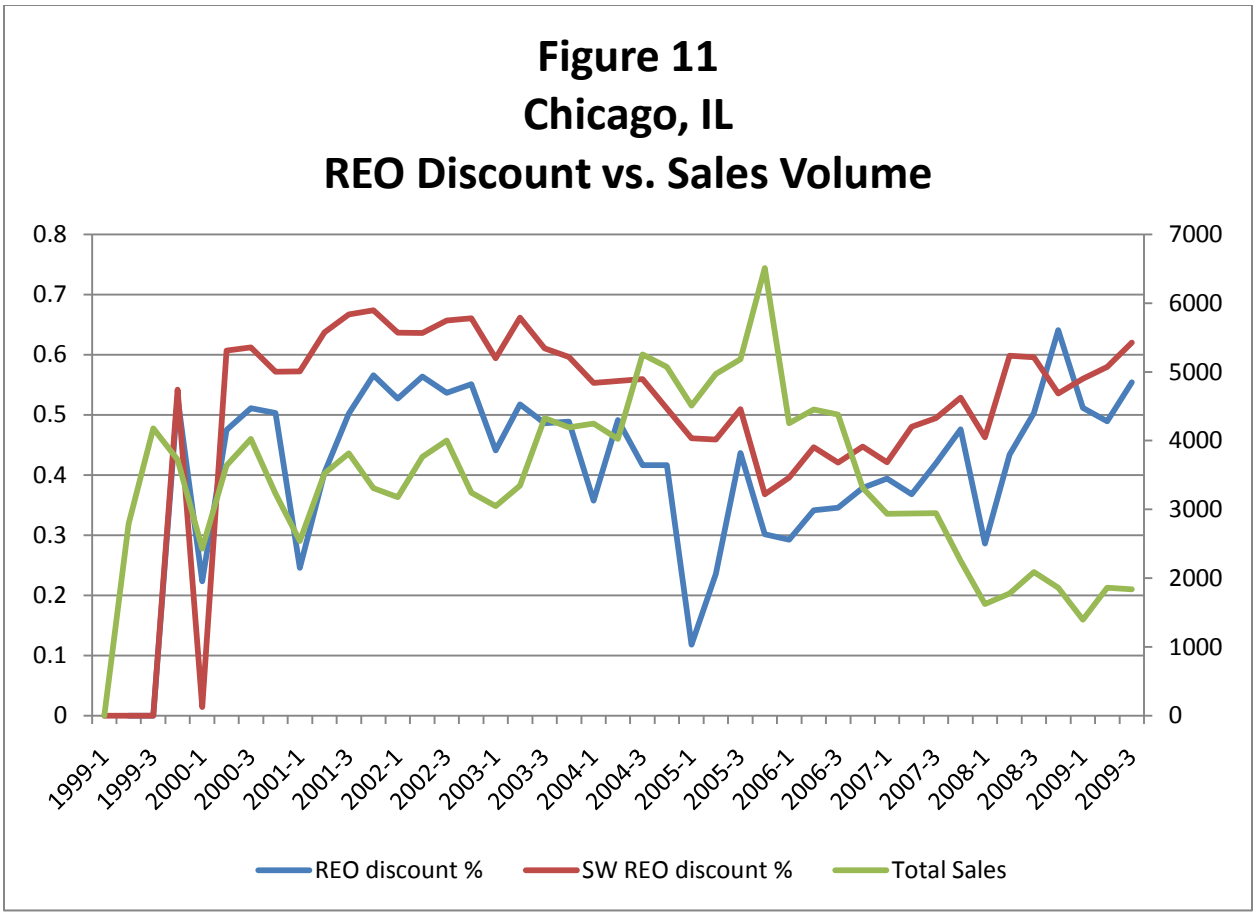
Figure 11
Chicago, IL
REO Discount vs. Sales Volume
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
7000
6000
5000
4000
3000
2000
1000
0
1999-1
1999-3
2000-1
2000-3
2001-1
2001-3
2002-1
2002-3
2003-1
2003-3
2004-1
2004-3
2005-1
2005-3
2006-1
2006-3
2007-1
2007-3
2008-1
2008-3
2009-1
2009-3
REO discount %
SW REO discount %
Total Sales