



Zillow Research Brief

Price Differences Between Foreclosures and Non-Foreclosures

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Introduction

Several months ago, [we had a lively discussion on the Zillow Blog](#) about whether foreclosures do, in fact, constitute a distinct market from non-foreclosures. I'd posted some data from the top U.S. metropolitan markets showing substantial differences in the median sale prices for foreclosures and non-foreclosures. For example, in the San Francisco market, where foreclosure re-sales made up 60% of transactions in December 2008, the median sale price for foreclosures was just 47% of the median sale price for non-foreclosures.

What ensued in the blog comments was a debate over whether this assertion was true or not, some arguing that, in their markets, there were so many foreclosures that they *were* the market and all prices fell into line with foreclosures (or didn't sell). Others agreed with the traditional line of reasoning holding that foreclosures have a few characteristics that cause them to transact at lower prices relative to non-foreclosures, specifically that the physical condition of the home may be inferior due to deferred maintenance (or outright vandalism) and the seller (i.e., the bank) is a *very* motivated seller (who may initially price the home in the range of a non-foreclosure but will move more quickly and more aggressively to lower the price).

In a nutshell, the two sides can be boiled down to, on the one hand, one of the initial comments:

...I don't follow your logic. If I'm looking for a home in San Francisco, I don't care whether I'm buying it out of foreclosure or not. It's just a home. Let's say House A and House B are identical except A is in foreclosure. If I pay the bank \$1 million for House A, it seems to me that's what House B is "worth," even if the owner of House B bought his place for \$1.5 million and won't sell it for a penny less.

...and, on the other hand, my response to this comment:

Empirically, the substantial differences in median sale prices between foreclosures and non-foreclosures (shown above in San Francisco but found in almost all markets) strongly suggest the presence of two distinct markets. Your natural rejoinder to this fact would be that the types of homes in the two markets are substantially different and it is this fact, not the nature of the transaction itself, that creates the difference in prices. It's

a good point. And one that deserves a bit of analysis and another blog post soon (examining price differences between foreclosures and non-foreclosures, controlling for other factors).

Well, the follow-up analysis that I promised on this point didn't come as soon as I'd like, but here it is nonetheless. First, a quick re-statement of our research question to make sure we're all on the same page: Is there a difference between foreclosure and non-foreclosure prices, *controlling for the location and attributes of each home*? By "attributes," I mean the physical specifications of the home including living area, lot size, and the number of bedrooms and bathrooms (not including the physical condition of the home which is a potential factor in any price differences between foreclosures and non-foreclosures and is, thus, something we want to measure, not control for).

Methodology

I briefly entertained the idea of pursuing an approach similar to that done in a recent, very interesting paper from Harvard's [Joint Center for Housing Studies](#) ("[Forced Sales and Housing Prices](#)" by Parag Pathak, John Campbell, and Stefano Giglio). Here, they used [hedonic regression](#) to separate the effect on sale price of being a foreclosure from the effects of other factors that also influence sale price like physical attributes and location. Their research found that foreclosures sell for approximately 28% less than non-foreclosures *after controlling for differences in individual houses*.

However, given that here at Zillow we already have home value estimates based on models much more advanced than linear regression techniques (i.e., the Zestimate), I opted for a different approach. The approach is as follows:

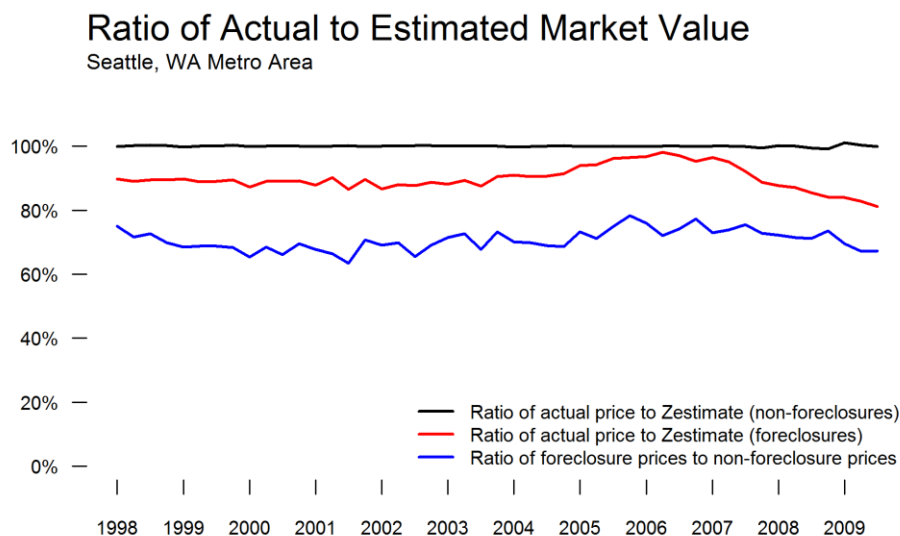
1. Our Zestimates are based on models that are trained on non-foreclosure sales. Thus, an individual Zestimate represents the estimated market value for the home assuming that the home is not sold as a foreclosure.
2. We can compute the ratio between the actual sale price of each home once it sells and the Zestimate for each home. Let's call this the Sale Price to Market Value Ratio.
3. We can then compute the median Sale Price to Market Value Ratio for any set of homes. This will tell us the typical ratio for the given set of homes. Specifically, we'll do this for both foreclosure homes and non-foreclosure homes, thus giving us two median ratios: a median Sale Price to Market Value Ratio for foreclosures and a median Sale Price to Market Value Ratio for non-foreclosures.
4. Given that the Zestimate is an estimate of a non-foreclosure sale price, we should expect that the median Sale Price to Market Value Ratio for non-foreclosures should be close to 100%. That is, *on average*, the sale price and market value are the same. We say "on average" because the Zestimate is an estimated value and therefore there is always some error associated with it (currently our median absolute percent error is 12.8% and we [routinely report it here](#) down to the county level). While there is some error in the Zestimate, it's important to note that this error is typically symmetrically

distributed around the actual price. That means, generally speaking, that a Zestimate is just as likely to be above the sale price as it is to be below the sale price. [As noted](#) elsewhere, it's this statistical property that allows us to create the Zillow Home Value Index which is a reliable and accurate index of local home values even though each home value itself has some error associated with it.

5. If we can show that it's true that the median Sale Price to Market Value Ratio for non-foreclosures is around 100%, then this is confirmation that our market valuation (the Zestimate) is a reliable indicator of market value where market value is defined as what non-foreclosures sell for. Once confirmed, it then follows that the median Sale Price to Market Value Ratio for *foreclosures* should tell us about the typical ratio between foreclosure re-sales and the market value of the home had it not been foreclosed. Again, remember, this ratio is being computed for every foreclosure re-sale by comparing the sale price to the specific market valuation for that home (so it controls for location, differing home attributes, and a whole lot more).
6. We'll look at this median Sale Price to Market Value Ratio for foreclosures to answer our original question about the difference between foreclosure and non-foreclosure sale prices.

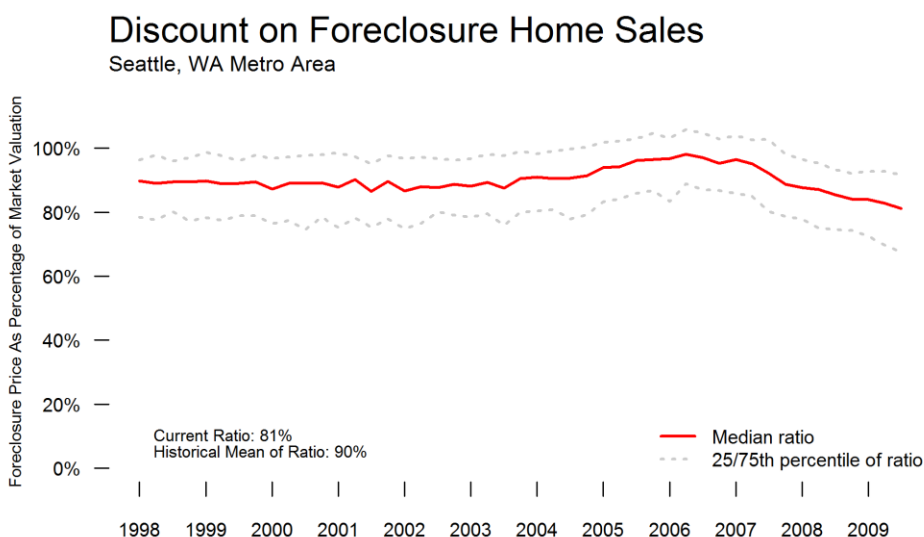
Findings

To get a better sense for what these various numbers mean, let's look at a specific market. In the chart below, you'll see data on the Seattle metropolitan market. The blue line shows the ratio of median sale price for foreclosures compared to the median sale price for non-foreclosures (it was this ratio that formed the substance of the initial blog post on this topic). The black line on the chart depicts what I've referred to in the preceding explanation as the median Sale Price to Market Value Ratio for non-foreclosures. Again, this is the typical ratio of a non-foreclosure sale price to the market valuation for that home (i.e., the Zestimate). Finally, the red line depicts the median Sale Price to Market Value Ratio for foreclosures.



A few important things can already be discerned looking at the Seattle chart. First, related to point #5 above, the median Sale Price to Market Value Ratio for non-foreclosures does, in fact, pretty closely track 100% over time with a few very small wobbles from time to time (thus confirming that the Zestimate is a good proxy for the market value of a home). Second, and most important for our research question, the median Sale Price to Market Value Ratio for foreclosures is consistently less than 100% (the ratio for non-foreclosures), indicating that, in this market, foreclosures always sell for less than market value (where market value is defined as what non-foreclosures sell for).

Moreover, looking at the blue line (the ratio of median sale price for foreclosures compared to the median sale price for non-foreclosures), we see that the median price for foreclosures in Seattle is currently at about 65-70% of the median price for non-foreclosures. The fact that the blue line is below the red line indicates that the act of controlling for the location and attributes of a home (the effect measured by the red line) does eliminate some, but not all, of the difference in overall sale prices between foreclosures and non-foreclosures (the effect measured by the blue line).



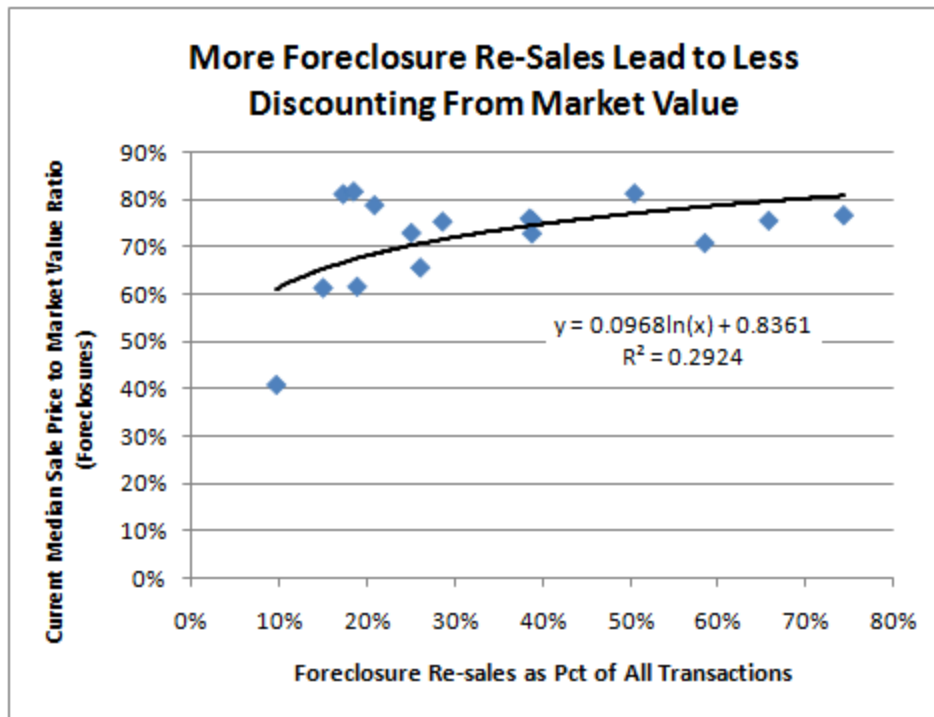
In the figure above, I've added bands for the 25th and 75th percentile values of the median Sale Price to Market Value Ratio for foreclosures in order to see the distribution of foreclosure sale prices over time. I've also noted the current value of this ratio (as of the end of September 2009) and the historical average. From here, we can see that, in Seattle, foreclosures are currently selling at about 81% of a home's estimated market value (i.e., a 19% discount) whereas historically they have sold at about 90% of the estimated market value (i.e., a 10% discount). The least amount of discounting occurred at the height of the real estate market (the period of 2005-2007 in Seattle), presumably because intense competition for housing bid

up even foreclosure prices and narrowed the gap between foreclosure and non-foreclosure prices.

In the table below, we report, for several major metro markets, the ratio of median sale prices between foreclosures and non-foreclosures, the current median Sale Price to Market Value Ratio for foreclosures (for September 2009), the historical median Sale Price to Market Value Ratio for foreclosures and the current percentage of all transactions in the metro made up by foreclosure re-sales. The time series of the median Sale Price to Market Value Ratio for each market are located at the end of this document.

Metro	Ratio of Median Sale Price of Foreclosures to Median Sale Price of Non-Foreclosures	Current Median Sale Price to Market Value Ratio (Foreclosures)	Historical Median Sale Price to Market Value Ratio (Foreclosures)	Foreclosure Re-Sales as Pct of All Transactions
Los Angeles, CA	53%	73%	91%	39%
Washington, DC	59%	79%	88%	21%
San Francisco, CA	43%	76%	91%	39%
Phoenix, AZ	60%	71%	93%	58%
Riverside, CA	68%	75%	87%	66%
Seattle, WA	67%	81%	90%	17%
Minneapolis-St Paul, MN	54%	66%	85%	26%
San Diego, CA	62%	76%	94%	39%
Pittsburgh, PA	28%	41%	53%	10%
Denver, CO	60%	73%	86%	25%
Cincinnati, OH	46%	61%	76%	15%
Portland, OR	78%	82%	90%	18%
Kansas City, MO	68%	75%	88%	29%
Sacramento, CA	67%	81%	90%	50%
Las Vegas, NV	70%	77%	91%	74%
Columbus, OH	45%	62%	77%	19%

Across all of these metro areas, foreclosures are currently discounted the greatest in Pittsburgh (59%) and the least in Portland (18%). The average ratio of foreclosure prices to market value across all of these markets is 72% (i.e., a 28% discount which, interestingly enough, is similar to the discount found by Pathak, Campbell, and Giglio in the study referenced earlier). Looking at the relationship between the prevalence of foreclosure re-sales and the foreclosure discount (see chart below), it appears that more foreclosures in an area do lead to a smaller gap between foreclosure and non-foreclosure prices. Importantly though, the ratio of foreclosure price to market value never gets much more than 80% either in the actual data or in the estimated relationship shown in the trend line in the chart (i.e., there is rarely less than a 20% discount for foreclosures).



Conclusions

It does seem clear that foreclosures sell for substantially less than non-foreclosures even after controlling for other characteristics of the home that affect price. The fact that the ratio of median sale price for foreclosures versus the median sale price for non-foreclosures (the blue line in the original Seattle chart above) is always less than the median Sale Price to Market Value Ratio for foreclosures (the red line in the original Seattle chart above) does suggest, as we speculated in the original blog post, that the types of homes in foreclosure do differ in meaningful ways from the types of homes that sell conventionally. These may be differences due to the proportion of homes from different price tiers in the local market that are experiencing the most foreclosure activity or differences in the location of foreclosure sales relative to non-foreclosure sales (i.e., locational differences that also affect sale prices). The net result is that the set of homes found in foreclosure are not equivalent to the set of homes that sell conventionally. Again, we know this because the price difference between foreclosures and non-foreclosures becomes less once we control for individual home characteristics (indicating that differences in these characteristics accounted for some of the original price difference). That said, differences in the composition of foreclosures and non-foreclosures don't account for all of the price gap as evidenced by the large discounts we still see when looking at the median Sale Price to Market Value for foreclosures (which controls for the individual housing characteristics).

There are two important practical implications of this result. The first is that it confirms the central point of the original blog post: foreclosures and non-foreclosures do constitute two distinct markets. This is precisely the reason that we don't include foreclosure re-sales in the

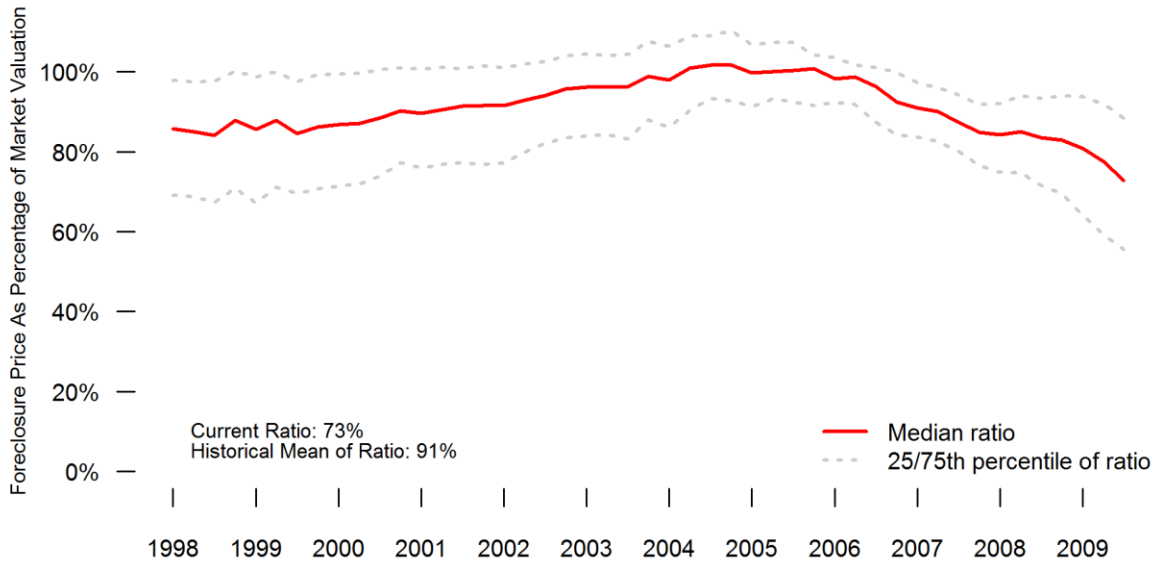
computation of our home valuations and, therefore, don't consider them in the Zillow Home Value Index. The purpose of both the Zestimate and the ZHVI is to give consumers an idea of home-specific and local market values under the assumption that consumers will buy and sell their homes in conventional, arms-length, full-value transactions. These values are, of course, influenced by foreclosures (as foreclosures inevitably suppress non-foreclosure prices) but looking at foreclosure prices when trying to make evaluations about non-foreclosure prices will give one a skewed picture of both home and local real estate values. This is a key reason why the ZHVI is currently down about 21% from peak whereas the Case-Shiller Home Price Index (which does include foreclosure re-sales) is down more than 30% from peak.

The second important implication involves the use of foreclosure sales in the appraisals of non-foreclosure homes. Doing so, without adjustment for the local difference in foreclosure and non-foreclosure prices, seems clearly inappropriate (see [here](#) for a good discussion of issues about this practice). Of course, adjusting for the condition of recent foreclosure sales as well as the difference in motivation of the seller in foreclosure sales when doing an appraisal on a non-foreclosure home sounds great in theory, but is undoubtedly quite complex in practice, particularly when the appraiser likely has not been inside all of the homes being used as comparables for the subject home.

Appendix: Discounts on Foreclosure Home Sales by Metro Area

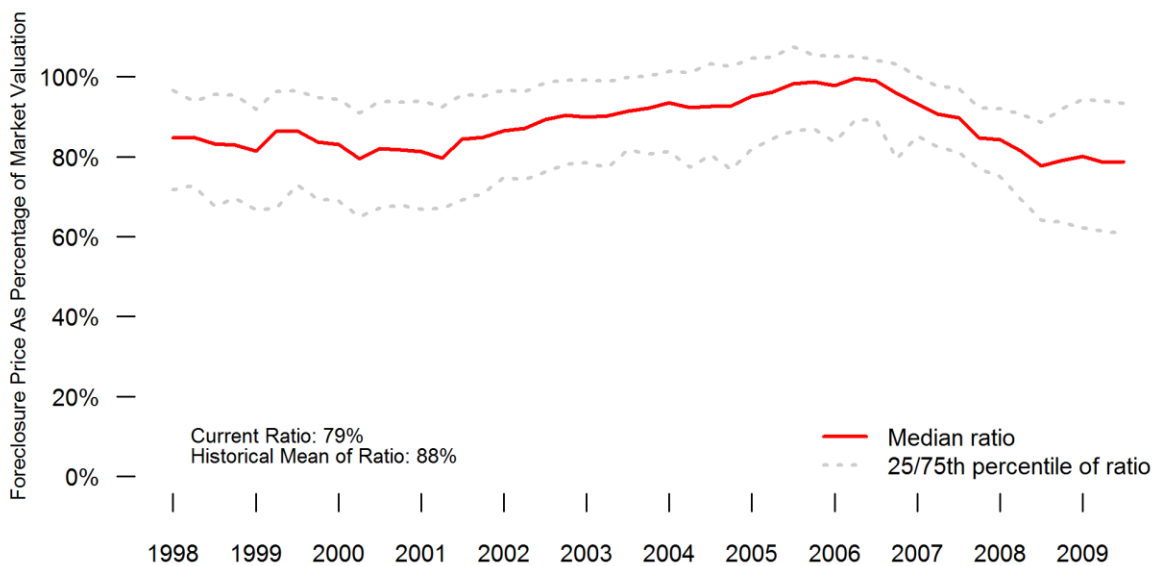
Discount on Foreclosure Home Sales

Los Angeles, CA Metro Area



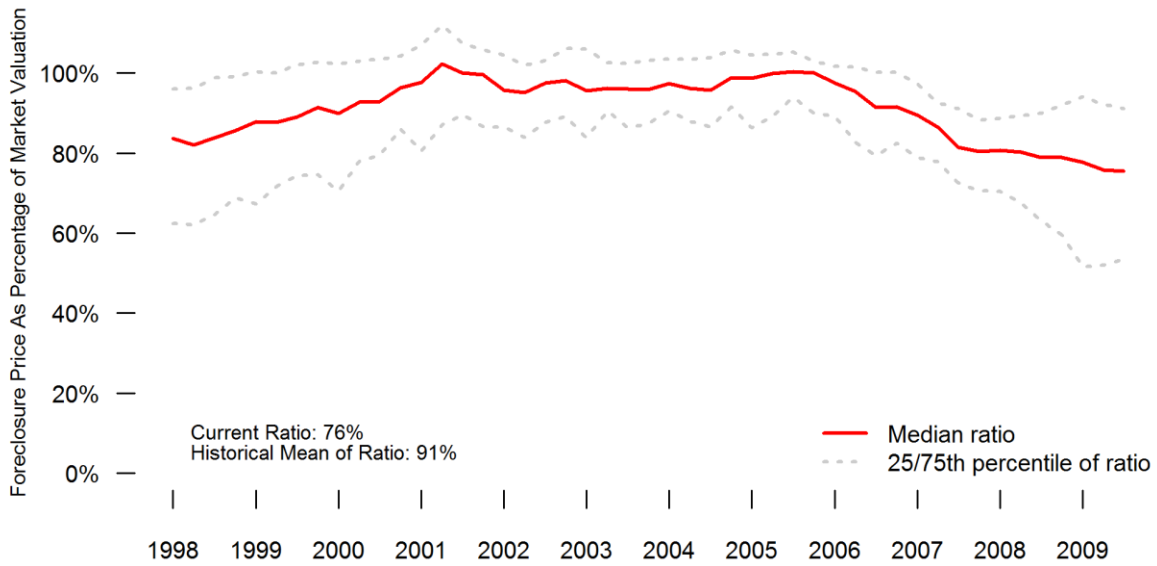
Discount on Foreclosure Home Sales

Washington, VA Metro Area



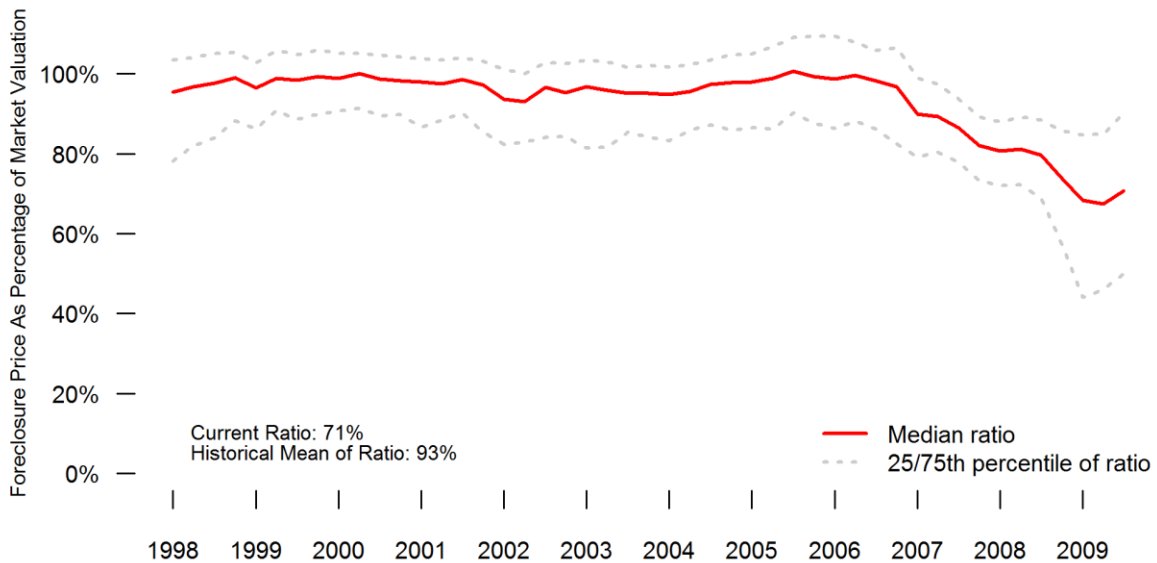
Discount on Foreclosure Home Sales

San Francisco, CA Metro Area



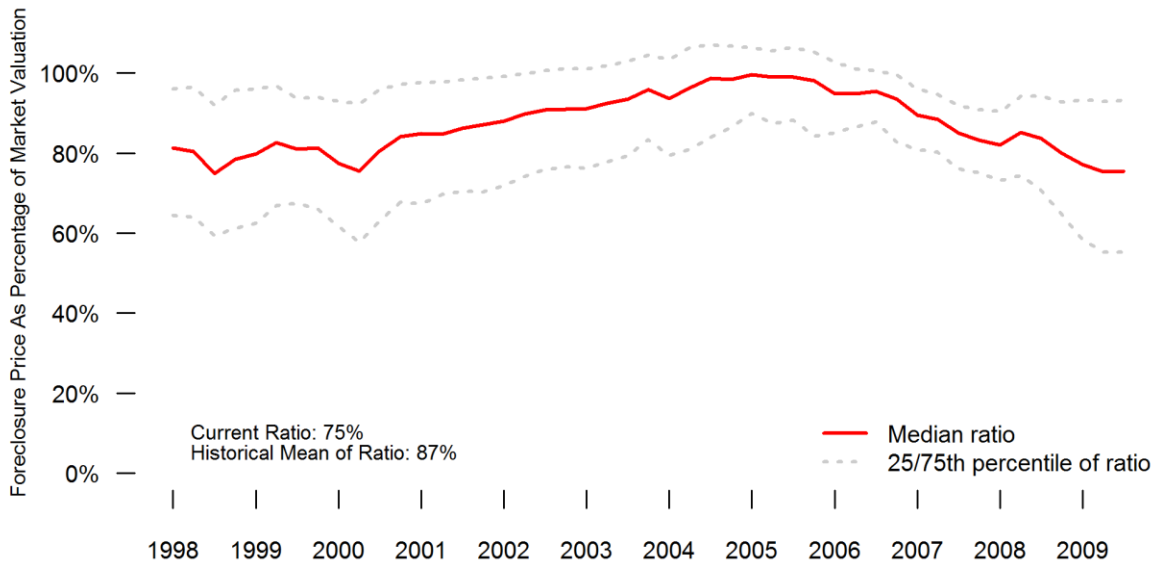
Discount on Foreclosure Home Sales

Phoenix, AZ Metro Area



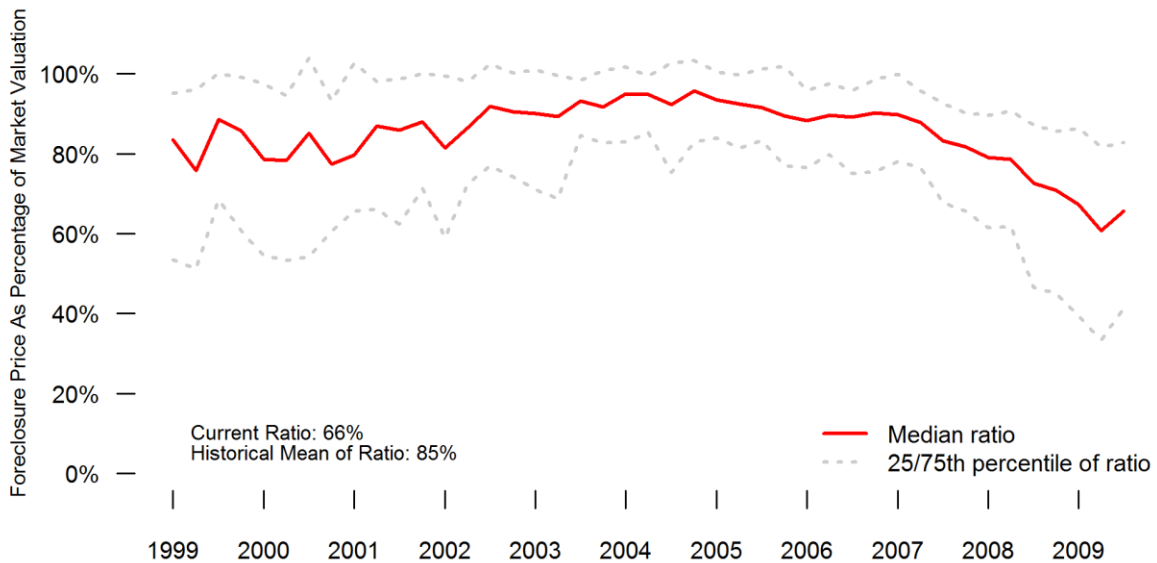
Discount on Foreclosure Home Sales

Riverside, CA Metro Area



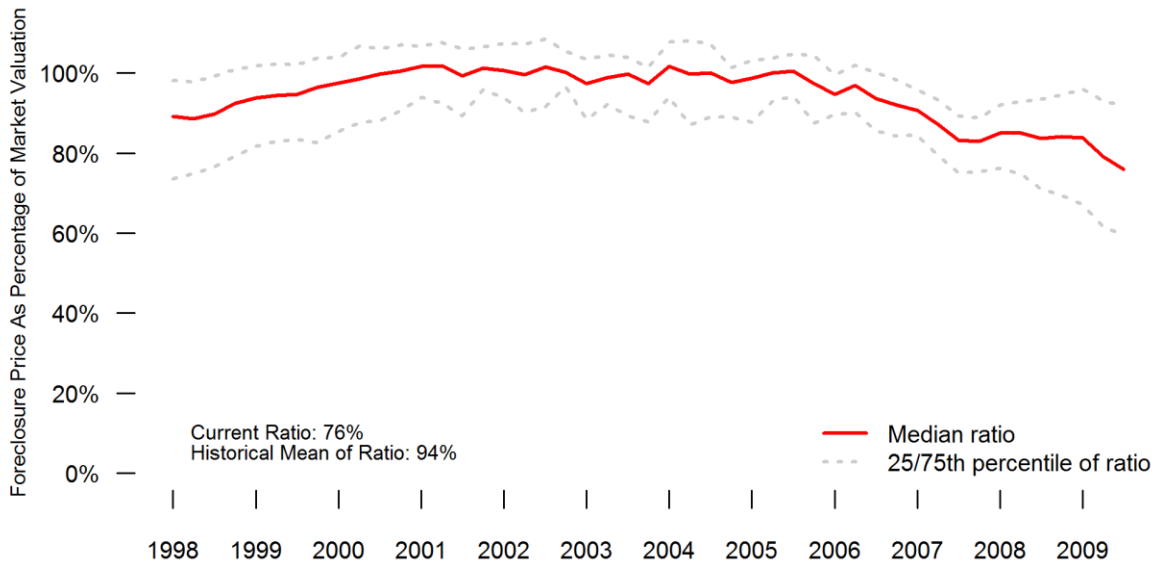
Discount on Foreclosure Home Sales

Minneapolis-St Paul, MN Metro Area



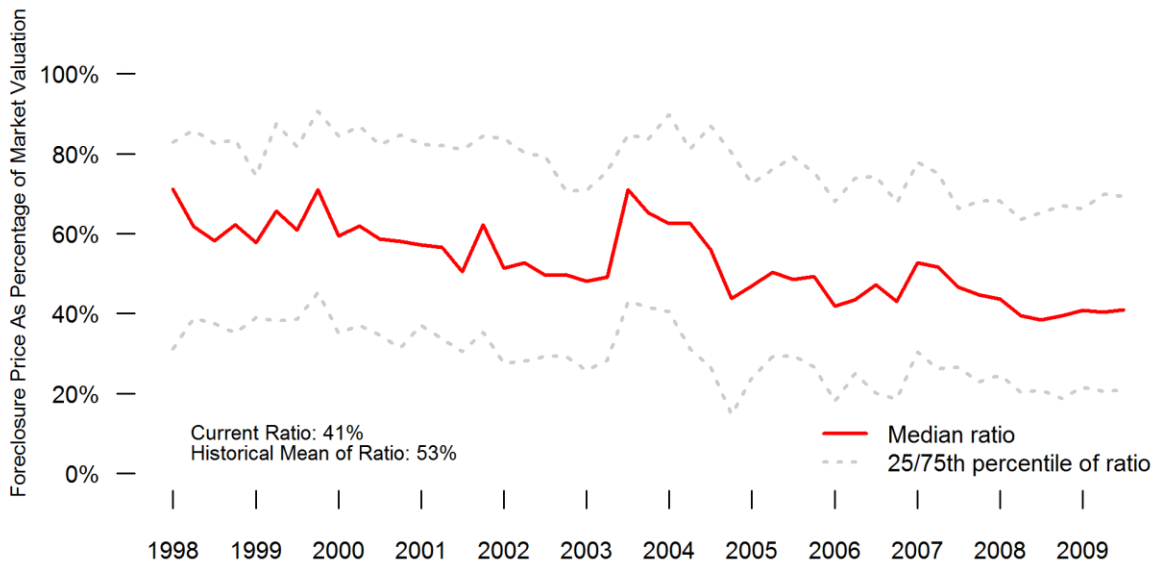
Discount on Foreclosure Home Sales

San Diego, CA Metro Area



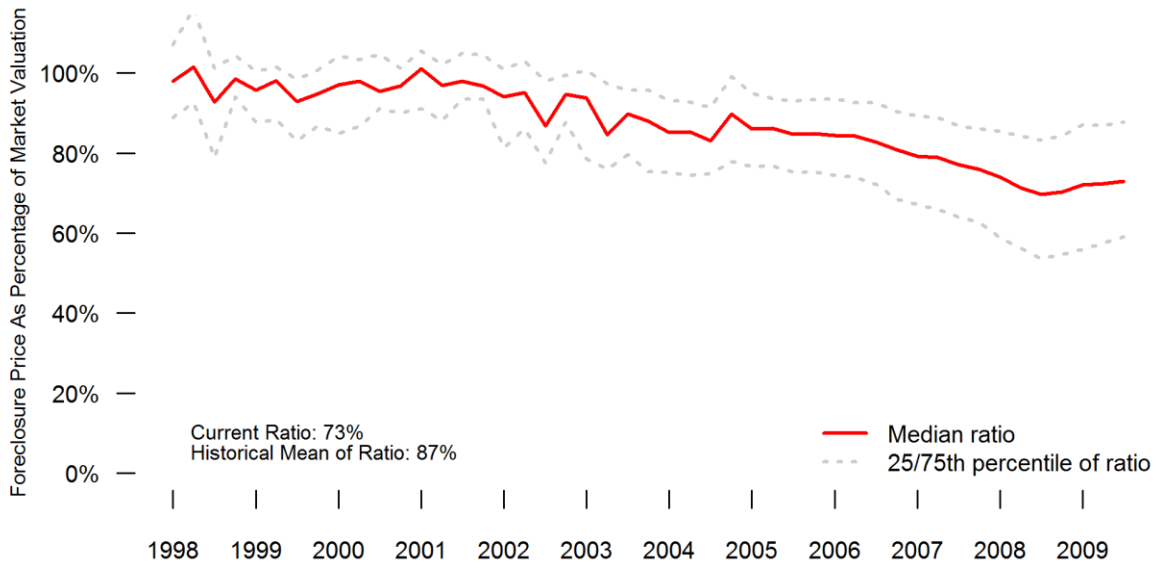
Discount on Foreclosure Home Sales

Pittsburgh, PA Metro Area



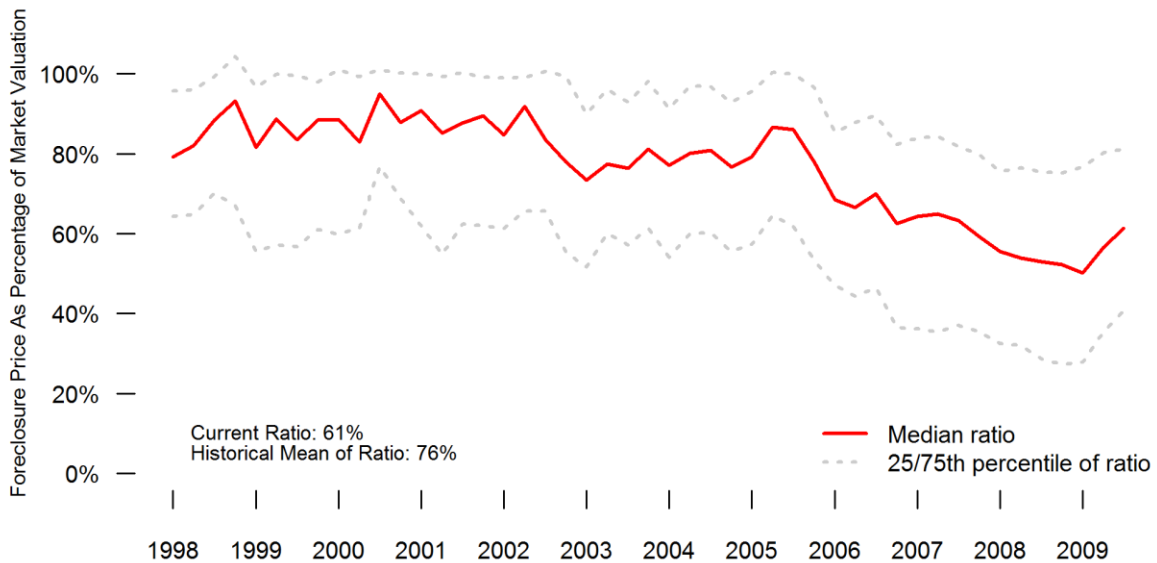
Discount on Foreclosure Home Sales

Denver, CO Metro Area



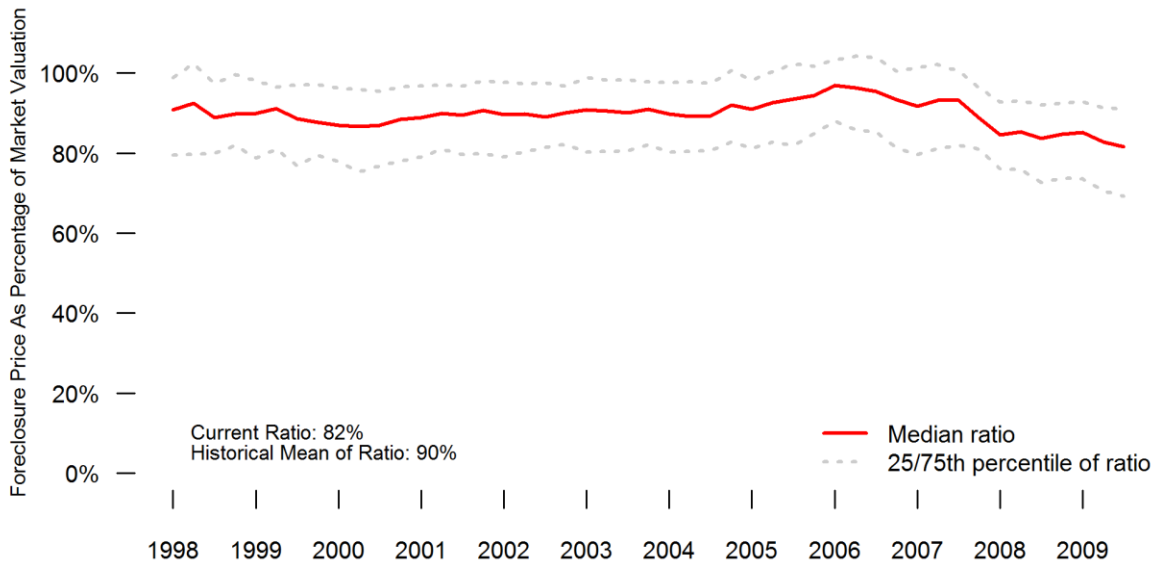
Discount on Foreclosure Home Sales

Cincinnati, OH Metro Area



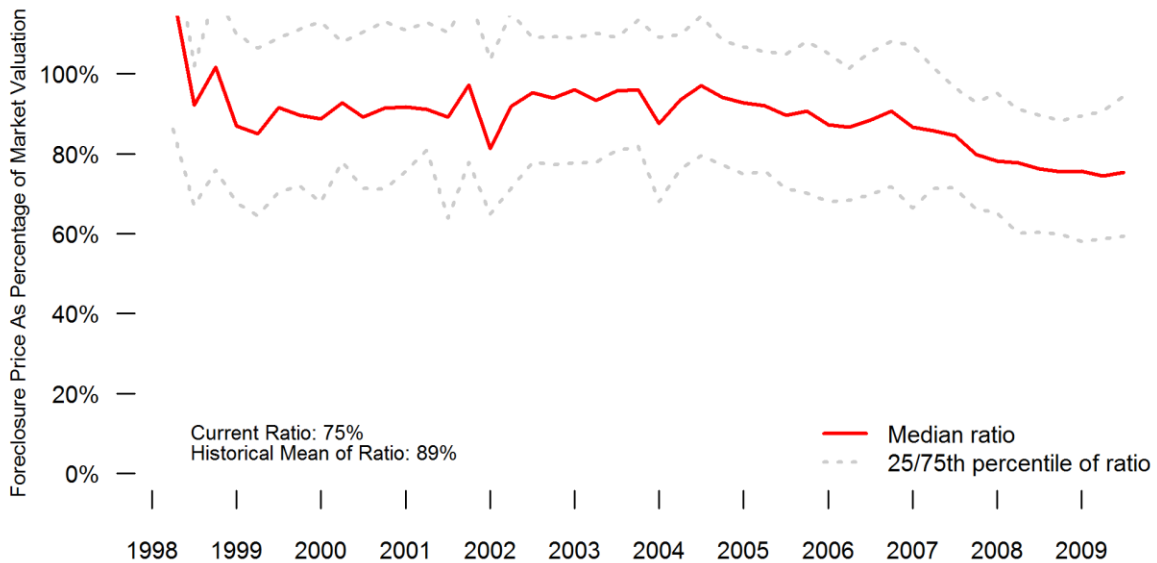
Discount on Foreclosure Home Sales

Portland, OR Metro Area



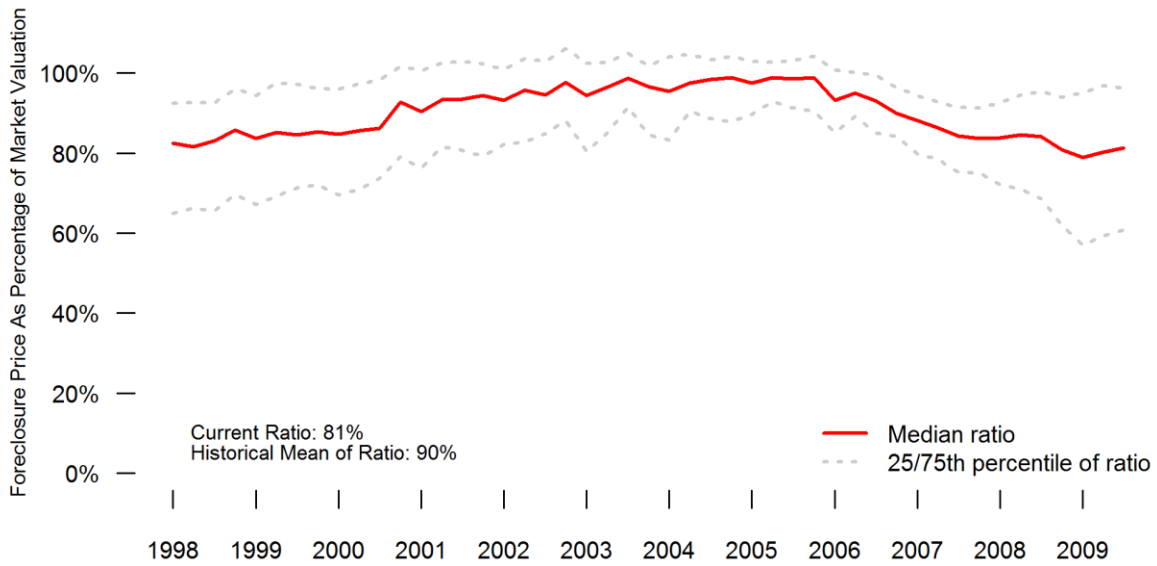
Discount on Foreclosure Home Sales

Kansas City, MO Metro Area



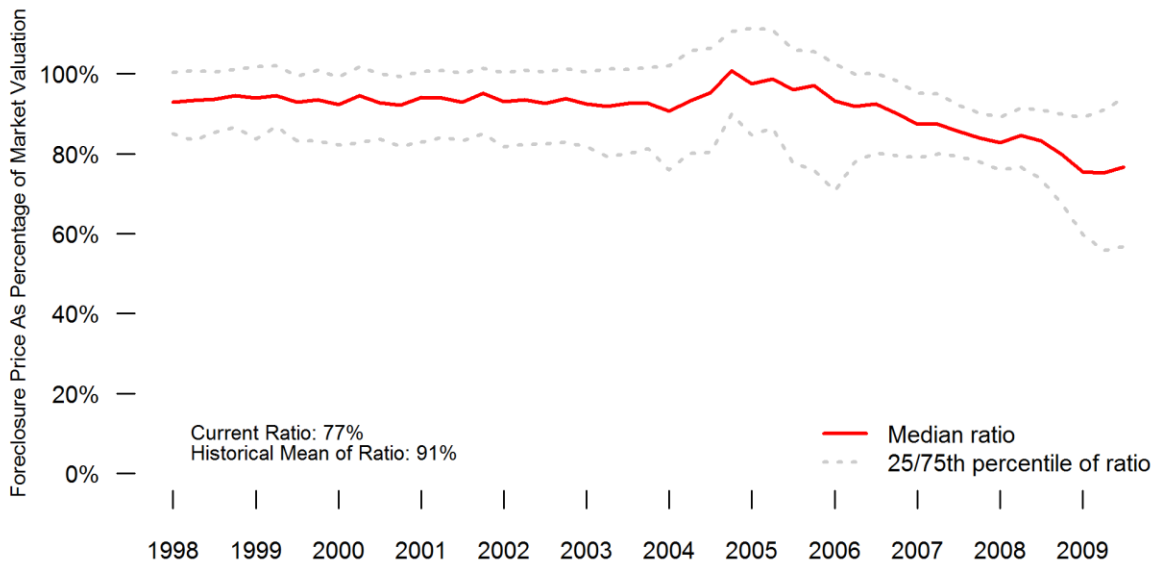
Discount on Foreclosure Home Sales

Sacramento, CA Metro Area



Discount on Foreclosure Home Sales

Las Vegas, NV Metro Area



Discount on Foreclosure Home Sales

Columbus, OH Metro Area

