

A Comparison of Arms-Length versus Non-Arms-Length Residential Home Sales: The Impact of Small Scale Investors

Richard A. Lee, Ph.D.

Barton College, USA

Phone: 252.39.6430

Email: rlee@barton.edu

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ABSTRACT

This study analyzes price changes between distressed, foreclosed residential homes and those of similar non-distressed homes in the Raleigh-Cary Metro area of North Carolina. Empirical studies provide clear evidence of a foreclosure price discount when homes transition into foreclosure; however, little research has been conducted on the post transition process and how homes emerging from foreclosure compare with similar arms-length properties. Using a panel data methodology, homes falling into foreclosure were followed until they exited foreclosure. Uniquely, the homes were tracked through four discrete time periods including the first arms-length sale before foreclosure until the first arms-length sale after emerging from foreclosure. Results show that foreclosed home prices depreciated faster, or were discounted more, than similar non-arm's length homes during the same period. However, by the first arms-length sale following the REO sale, foreclosed home prices were comparable to those of similar non-foreclosures. Small scale real estate investors were found to be a major contributor in hastening this mean reversion in prices. These small "mom-and-pop" investors took on average 254 days to purchase, rehabilitate and sell a foreclosed home after purchasing it out of REO inventory, with median home price appreciation rates 32.8% higher than Federal Housing Finance Agency Home Price Index (HPI) for the same area. The results reveal the importance of small-scale investors in internalizing the costs needed to rehabilitate distressed residential homes. Such efforts work to curtail falling prices in adjacent properties and to stabilize home prices in weak housing markets.

Keywords: *Foreclosure discounts, REO, repeat sales, foreclosure auction, distressed assets, small-scale investors*

Introduction and Research Question

Empirical studies show that foreclosed or distressed residential real estate sells at a discount when compared to sales of similar non-distressed properties. Theoretically, such risk free arbitrage opportunities should not exist among homogenous goods, at least in the long run. If a discount does exist, properties resold after being purchased at a discount should show abnormal returns when compared to similar properties sold in the same area. Indeed, much of the existing research appears divided on the exact amount of the discount. Some researchers find substantially high discounts (Shilling, Benjamin & Sirmans, 1990; Forgey, Rutherford, & VanBuskirk, 1994; Hardin & Wolverton, 1996; Springer 1996; Sumell, 2009; Campbell, Giglio & Pathak, 2011) while others argue empirical models improperly control or use biased estimates in their analysis, rendering discounts to much lower results (Carroll, Clauretie & Neil,

1997; Clauretie & Daneshvary, 2009; Harding, Rosenblatt & Yao, 2012). The purpose of this study is not to extend the discount debate, but rather investigate the foreclosure cycle of a unique regional area. Specifically, the study identifies and analyzes 186 foreclosed single family homes for one unique county in the Raleigh-Cary Metro area of North Carolina and follows the homes as they transition into and out of foreclosure. Of interest is how the small scale investor impacts appreciation rates of homes transitioning out of real estate owned (REO) status. Small scale investors of residential properties, sometimes called mom-and-pop investors, make up nearly 60% or more of REO purchases in certain areas (Brennan, 2012). Understanding how these small scale buyers and sellers impact residential real estate prices is an important part of any real estate cycle.

Studies vary widely in the research regarding foreclosure discounting. Recent work by Harding, Rosenblatt and Yao (2012) find the foreclosure discount barely covers the transaction costs of the purchase. They argue that when rehab costs, buyer-bargaining power, investor or owner-occupant purchaser, neighborhood conditions and demographics are considered, only a small 1.4% per-year discount remains. Pennington-Cross (2006) shows that REO foreclosed properties appreciate less than area-wide appreciation rates due to varying judicial foreclosure laws, loan features and housing market conditions. Other studies report much higher discounts with some averaging 47% or more (Campbell, Giglio & Pathak, 2011). Such dispersion in the findings strengthens the fact that real estate is a heterogeneous asset and prices can reflect varying geographical, economic, legal and demographic attributes within a specific study area. From the researcher's viewpoint, the discount mechanics are dynamic and can change between market and sub-markets based on a combination of discounting variables. When these variables are added together, they form a discounting mechanism or *discount stack* unique to each sub-market area of study. Appendix 1 provides a general diagram of the foreclosure discount stack.

Data used to conduct the study were obtained from three disparate data sources from County's tax, geographic (GIS) and Register of Deeds departments and combined into one integrated database. Using a repeat sales panel data methodology, 186 homes were identified as having transitioned through the foreclosure process at four unique periods, including 1.) The arms-length-sale prior to foreclosure; 2.) The foreclosure auction sale; 3.) The REO sale; and finally, 4.) The final arms-length-sale where the property exits the foreclosure cycle. Price changes were recorded for the each transition period, with the average home taking 8.9 years to complete the cycle. Findings show that small scale investors of REO properties had overwhelmingly higher home price appreciation rates than owner occupants during the same period. The findings also show that foreclosures selling out of REO appreciated faster than non-foreclosed properties when compared to the Federal Housing Finance Agency Home Price Index (HPI) (Federal Housing Finance Agency, 2013).

These findings have strategic importance for any geographical area experiencing high residential foreclosure rates. First, small scale investors appear more inclined to internalize the costs needed to physically rehabilitate foreclosures and in turn shorten the time such properties stay on the market. Recent studies have found that the length of time a foreclosed property stays on the market, the more negative externality the property has on neighboring home prices (Kobie, 2010). Secondly, the findings show that homes were overpriced at the foreclosure auction and fell an additional 24.13% at the REO sale. In thin-market situations, especially with falling home prices, it may be more prudent to adjust the selling price to appropriately reflect true market valuations. Doing so, shortens the lender's disposition time and possibly hastens the needed physical rehabilitation of the home.

The following sections discuss the overall foreclosure process in North Carolina and the existing literature regarding home foreclosure discounts. Earlier work almost exclusively focuses on the time leading up to the REO sale and the

subsequent impacts foreclosures have on surrounding property values. Although this study follows and measures home price fluctuations throughout foreclosure cycle, the main focus is on post REO home prices and how small scale investors impact the pricing dynamics at this stage of the cycle. Empirical results are given and discussed along with closing conclusions and several policy implications.

North Carolina Foreclosure Process

The review of literature on foreclosure price discounts centers on two widely debated arguments. First, do actual foreclosure discounts exist after considering a myriad possible economic, financial, demographic, social, spatial, temporal impacts? Secondly, if such a discount does exist, what factors, or combination of factors, contribute to the discount? The literature surrounding this debate is extensive and involves proponents on both sides of the argument; however, recent studies (Frame, 2010) would appear to support the existence of a discount, leaving the second debate, or the amount of discount, open for further scrutiny. The following review describes the residential foreclosure process in North Carolina and distinguishes a foreclosure transaction from a normal arms-length transaction¹. Next, a review of existing literature chronicles the ongoing debate surrounding the foreclosure discount and possible explanations for such discounts.

Foreclosures in North Carolina follow one of two possible processes, judicial or non-judicial, with the majority taking the non-judicial route. Judicial foreclosures involve filing a lawsuit and obtaining a court order before foreclosing. Reasons for taking the judicial process may include no “power-of-sale” clause in the mortgage deed of trust or issues involving the legitimacy of property’s title. The most widely used foreclosure process involves the non-judicial or out-of-court process. Figure 1 below provides a general outline of the non-judicial foreclosure process in North Carolina.

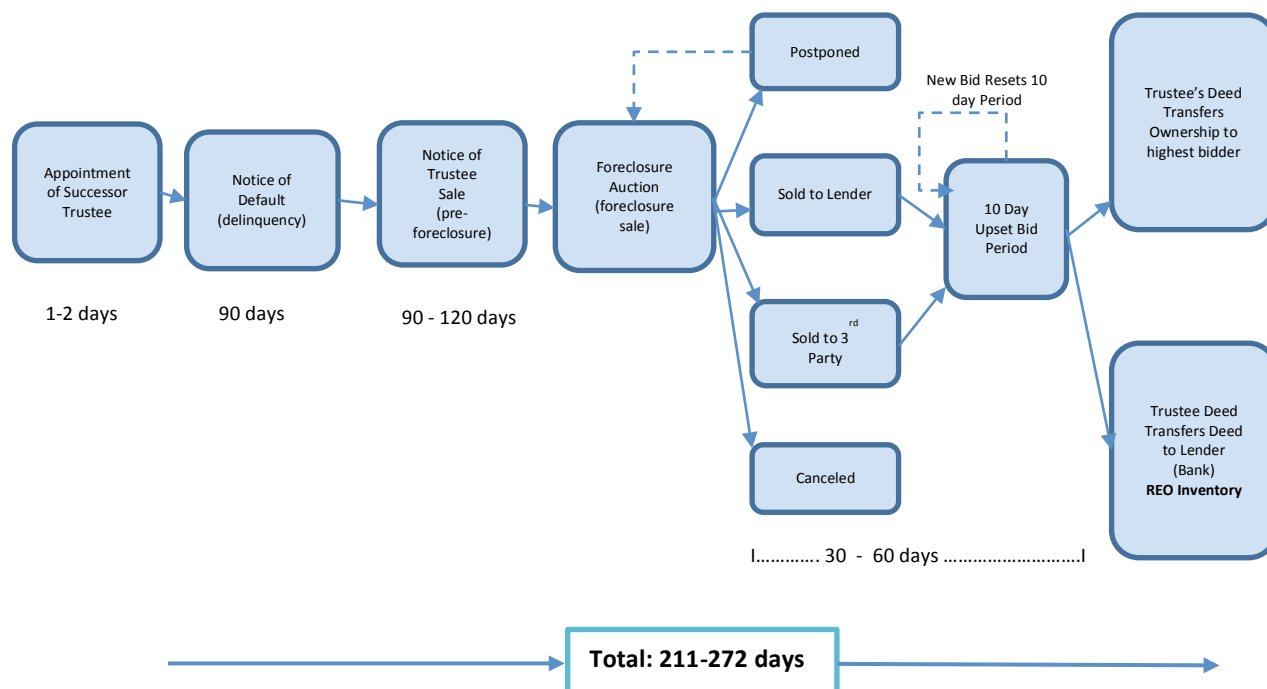


Figure 1: Non Judicial Foreclosure Process in North Carolina

When a mortgage loan is created, a deed of trust is filed in the county where the property is located by the closing attorney. This attorney serves as the trustee in a three-way relationship between the lender and borrower and ensures the agreements stated in the deed are met by both borrower and lender. In most instances, the terms of the deed are honored with the borrower making monthly mortgage payments to the lender. Eventually, the mortgage is paid in full and legal title of the property is transferred to the borrower. While the loan is outstanding, the borrower retains equitable use, possession and enjoyment of the property, but not outright ownership since the mortgage serves as a lien on the property. Only after the loan is satisfied does the borrower own full title to the home. If the borrower fails to make several payments, the power-of-sale clause in the deed of trust allows the lender, through the trustee, to sell the property at public auction. In most instances considerable forbearance measures are exercised by the lender before initiating foreclosure proceedings.

The foreclosure path proceeds sequentially through three stages including pre-foreclosure, foreclosure and post-foreclosure. In the pre-foreclosure stage the lender usually substitutes the original trustee with a firm specializing in foreclosures². This is done via a written document recorded in the county where the real property resides. Next, a Notice of Default is filed at the courthouse and sent to the borrower, usually by the county sheriff. During this time, called the reinstatement period, the borrower can bring the loan current by making payments in arrears along with any accumulated fees. If the loan is not brought current, the trustee sets a sale date for public auction at the county courthouse on a weekday between 10:00am – 4:00pm. This period is referred to as the Notice of Trustee Sale and advertised publicly at the courthouse and through local newspapers. Even during this period the borrower has a chance to reinstate the loan and pay in full all mortgage payments in arrears, attorney fees and court costs.

The foreclosure stage begins with the trustee sale or foreclosure auction. The sale is conducted and the property sold to the highest bidder. Bidding usually starts with the minimum bid set close to the loan's current balance. Probable bidders include small LLCs, brokers, contractors and individual investors, or what might be generally considered "mom and pop" investors. For loans with high loan-to-value (LTV) ratios, the home is sold back to the lender and enters into the lender's Real estate Owned Inventory (REO). At this point the home now belongs to the lender. North Carolina practices a 10-day upset bid period where another party can offer to purchase the property by increasing the reported sales price by 5%. Each time an upset is made, another 10-day upset bid period begins. This process continues until no further bids are made on the property and the last bidder of record becomes the owner. It should be noted that even at this later stage of the foreclosure process, a right of redemption exist and the original owner can regain the home by paying all mortgage payments in arrears, attorney fees and court costs. In total, the pre-foreclosure process to post-foreclosure process can take from 211-270 days. For a detailed discussion of North Carolina foreclosure procedures the reader can refer to Maitin's (2008) publication for the North Carolina Title and Land Association.

Literature Review

Empirical studies attempting to prove or disprove the presence of foreclosures discounts abound in the review of historical literature. The overwhelming conclusion of these studies appears to support a very real discount, with the debate centered primarily on the percentage of the discount. Real estate markets and sub-markets are heterogeneous and it not surprising to find differing empirical results. A majority of the studies use disparate regional datasets; however, several recent studies by the Federal Reserve Bank (Harding, Rosenblatt & Yao, 2012) aggregate multiple regional and metro areas into their models. As real estate researchers well understand, no two locations are exactly homogeneous and finding differing results would not be uncommon.

It is not the intent of this research to further the debate for or against foreclosure discounts, but to simply overview the historical literature surrounding the research. Such research forms the basis for more in-depth and pressing problems such as foreclosure spillover and contagion effects (Gerardi, Rossenblatt, Willen & Yao, 2012) and the many financial and social impacts triggered by foreclosures. This review separates earlier research into several Meta or discounting categories revealed by the literature. Before reviewing these categories however, foreclosure discounts, and more specifically REO foreclosure discounts, are briefly defined.

An REO foreclosure occurs whenever a mortgage servicer, lender, government sponsored enterprise (GSE), Federal Housing Administration (FHA) or Veterans Affairs (VA) entity acquires a home either through voluntary conveyance or after the forced sale at public auction. This repossession process and the eventual resale of the home out of REO create an abnormal or atypical sales process³. Any potential variance in the sales price due to this abnormal process as compared to a normal arms-length sale would constitute a foreclosure discount. Indeed, much of the prior econometric research focuses on proving or disproving the proper controls or attributes to include in the optimal pricing model. As mentioned earlier, determining these unique attributes is difficult due to varying demographic, neighborhood and property characteristics surrounding each home.

Foreclosure discounts can be categorized into several functional areas. Independently, each of these factors can contribute to the discount, but more realistically work in combination, forming what might be considered a “discount stack” that represents the aggregate discount similar to that found in Appendix 1. Functional areas highlighted in the research include the condition of the property; general property attributes; market conditions; investment externalities and contagion effects; stigma biases and buyer/seller motivations; liquidity preferences; and regulatory/capital requirements of the seller.

Probably the most obvious category includes homes suffering from neglect or deferred operational and capital maintenance (Harding, Miceli & Sirmans, 2000; Summel, 2009; Campbell, Gigilo & Pathak, 2011; Clarretie & Daneshvary, 2009). Such homes tend to be in poorer condition and sell at a lower prices when compared to similar homes. Modeling the appropriate deferred maintenance discount however has been problematic for most econometricians. Placing dollar values on property damage, vacancies and repair costs is not symmetrical across properties and can vary widely by region, neighborhood and property. Likewise, servicers or lenders may rely on broker price opinions (BPO) when establishing REO resale price points. These opinions are often completed through cursory drive-bys of the foreclosed property and may fail to accurately capture deferred maintenance costs. Apgar and Duda (2005) estimated that vacant homes left on the market for extended periods cost municipalities between \$5,000 to \$35,000 per home depending on the length of vacancy, deferred maintenance and damage. Even if the home were occupied, residents hesitate to maintain a home they foresee as eventually defaulting.

Additional studies find that foreclosed properties have common characteristics, such as smaller living spaces, are older, in poorer neighborhoods and have smaller lot sizes (Lee & Immergluck, 2012; Harding & Rosenblatt & Yao, 2012). These findings also highlight one of the more debatable issues surrounding the discount measurement. Opponents contend that abnormal discounts are associated with the characteristics of the home and neighborhood and not simply a reflection of being in foreclosure (Carroll, Clauretie & Neil, 1997; Clauretie & Daneshvary, 2009; Rutherford & Chen, 2012). Empirically, they find that without proper controls for zip codes, neighborhoods, neighborhood foreclosure counts, property condition and size, discounts are probably biased. Likewise, media portrayal and national wide coverage of foreclosures in blighted and vacant neighborhoods such as Detroit creates a stigma or bias toward foreclosures (Coward & Peng, 2004); however, Pennington-Cross (2006) and Clauretie and

Daneshvary find the bias is relatively small when proper controls are included in the model for property condition, location, market impacts.

Changing market conditions can also play a significant role in determining the range for foreclosure discounts (Chau & Ng, 2008). Markets such as Phoenix, Arizona; Las Vegas, Nevada; and Miami, Florida are examples where overall market prices, not just foreclosure prices, have experienced wide fluctuations in recent years. Although foreclosures may sell for lower prices, the lower price may simply be a response to overall market price trends (Campbell et al. 2009; Daneshvary, Clauretie, Kader, 2011). Similar to the property condition problem, separating or distinguishing the proper controls for general market movements from those of foreclosures is difficult. Outside of a detailed market appraisal, most datasets used for valuation purposes will inadequately capture rapidly changing price fluctuations and typically lag true market equilibrium prices.

A more recent set of studies investigates the investment externality created by foreclosures (Gerardi et al, 2012) and the spillover effects these externalities have on nearby properties (Daneshvary, Clauretie & Kader, 2011; Harding & Rosenblatt & Yao, 2009; Kobie, 2009; Rutherford & Chen, 2012). During the pre-foreclosure and foreclosure process, neither owners nor lenders have an incentive to maintain the property, which over time can lead to deferred maintenance and deferred capital expenditures. From the homeowner's perspective, this may be attributed to several factors. First, foreclosures are typically triggered when life-changing events occur in the household, such job-loss, death, illness, divorce or some other cash-flow altering event (Campbell et al., 2011). Available cash flowing into the household is used for basic consumption needs creating a disincentive to invest in the property. Secondly, when the owner realizes the home is being foreclosed, there is an added disincentive to invest in the property. Why make repairs when the home is going to be lost anyway. As these deferred maintenance problems persist, neighboring properties eventually succumb to these investment externalities creating a "contagion" of falling home prices throughout the neighborhood (Li, 2013; Gangel, Seiler & Collins, 2013). As more homeowners fall underwater on their mortgages⁴, more defaults occur creating a feedback loop of falling home prices. In such situations, endogeneity, reverse causality and simultaneity bias becomes more difficult to control (Gerardi, Rossenblatt, Willen & Yao, 2012).

Additional costs and disinvestment in the property continues after the home goes into foreclosure. At this point, the lender now owns the property as REO inventory⁵ and must consume the added expenses in maintaining and selling the property back into the market. Underinvestment can occur since the lender is no longer receiving payments or fees from the defunct mortgage, which is now a non-performing asset on the company's balance sheet. In many instances the REO agent is merely administering the foreclosure on behalf of a securitized trust and receives no financial benefit from overseeing the property. In such situations, asymmetric information problems can arise between the owner and servicer causing the servicer to ignore possible gains on the resale of the property (Gerardi, et al., 2012). In an effort to minimize the additional holding costs⁶, servicers may attempt to increase liquidity and reduce the time on the market (TOM) for the property (Jud, Seaks and Winkler, 1996; Taylor, 1999; Clauretie and Thistle, 2007).

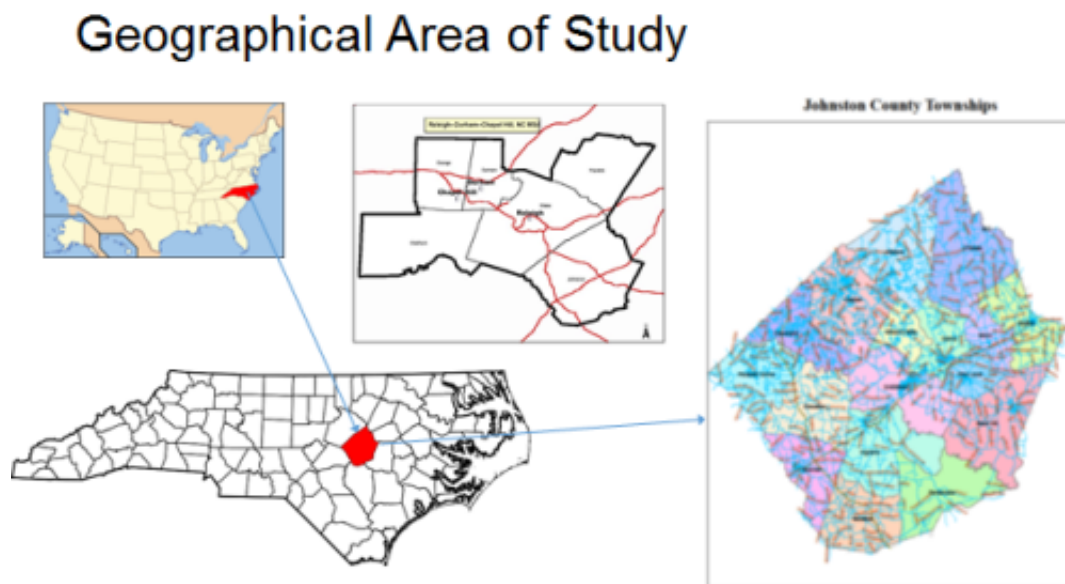
In summary, the literature overwhelmingly confirms the existence of a foreclosure discount; however, the exact discount amount and proper coefficients to include in any empirical model still appears allusive. This paper argues that no unique model will fully capture each and every foreclosure situation. Markets and sub-markets are compellingly heterogeneous and it is plausible that multiple models will exist to capture the different market variations⁷. More importantly, the literature reveals the difficulty in controlling for the condition of the property, and to

this point, only superficial attempts to gauge property condition have been attempted⁸. Gerardi et al. (2012) argue that the most obvious way to deal with such asymmetrical information conditions, where there is no incentive to invest further resources into the property, is to “sell the property to a small-scale investor who internalizes the costs and benefits (p. 21)”. With this statement in mind, we attempt to discover the impact small-scale investors have on market price appreciation rates for foreclosed-residential properties.

Data and Methodology

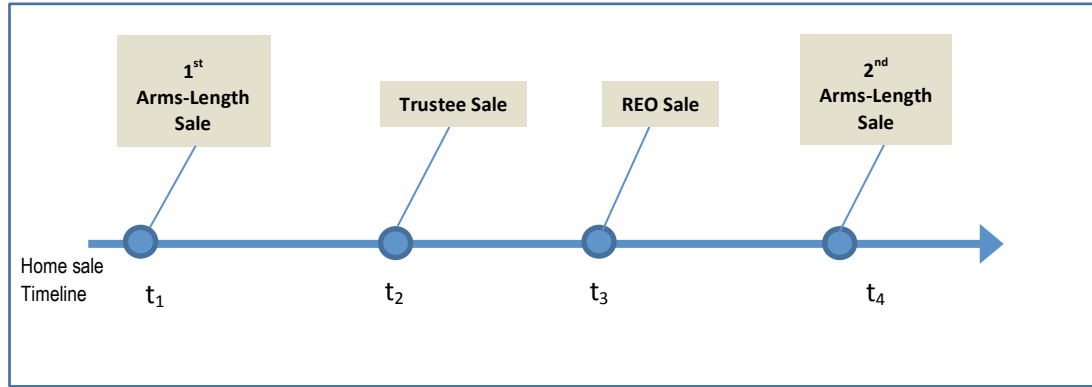
The geographical area of study includes Johnston County, North Carolina, located in the larger Raleigh-Cary metropolitan census area shown in Figure 2. Three separate, disparate databases were used to construct the study's dataset. Property sales, appraisals and tax records were obtained from the County tax administrator's office; judicial land records including warranty deeds, deeds of trust and special warranty deeds were obtained from the register of deeds office; and, geospatial and property specific data were obtained from the County's geographical information systems (GIS) department. Each disparate dataset was integrated into one unique database for analysis purposes⁹.

Figure 2: *Geographical Study Area*



Using the integrated data, descriptive statistics were calculated for the county. Instead a point-estimate hedonic approach used in many earlier studies, a panel-data regression methodology was used to capture repeat homes sales transitioning through the foreclosure process. Figure 3 provides a graphical representation of the sales timeline from the first arms-length-sale, trustee sale, REO sale and eventually the final arms-length-sale. In total, four repeat sales were recorded representing the transaction price as the each home moved into and eventually out of foreclosure. In total, 186 single family residential homes were identified as fully completing the cycle. Each home was verified to ensure no major physical changes were made to the home throughout the time period¹⁰.

Figure 3. Foreclosure Cycle Timeline



Prior studies (Campbell, Giglio & Pathak, 2011; Sumell, 2009) focus almost exclusively on discovering whether price discounts occur as homes enter into REO status, or from t_1 - t_3 . The model created for this study examines the price appreciation occurring from t_3 - t_4 or when homes eventually transition out of REO status. If a discount does indeed exist, then homes emerging from REO status should produce higher appreciation rates when compared to similar homes in the market. Measuring home price changes with repeat sales provides an alternative to the traditional hedonic approach and uses the price change for houses sold more than once. First introduced by Bailey et al. (1963), the repeat sales approach avoids possible bias estimates for changing home characteristics and quality over time. In this case, the home's size, location and other distinguishing characteristics are considered time invariant or fixed between transactions. Such time invariant factors can be differenced out between two adjacent selling periods by subtracting home prices at t_4 from t_3 . The price at t_3 can be stated as follows:

$$\ln(P_{it3}) = \beta_{0t3} + \beta_1 X_{it3} + \beta_2 Y_{it3} + \beta_3 GRM_{it3} + \varepsilon_{it3} \quad (1)$$

where $\ln(P_{it3})$ is the log of the house price i at time t_3 ; X_{it3} is a vector of house characteristics for each home i at time t_3 ; Y_{it3} is a vector of neighborhood or spatial characteristics for house i at time t_3 ; GRM is the gross rent multiplier for house i at time t_3 ; β_{0t3} is the intercept term and ε_{it} is the error term assumed to be independent across observations and identically distributed from a normal distribution with mean zero and constant variance. The GRM variable is added to the traditional hedonic repeat sales method in equation 1 to capture the investor's view of value at the REO sale. REO purchases by investors, especially distressed REO homes, can represent nearly 60% of REO sales (Brennan, 2012; NAR Investors Survey, 2009). Investors use the GRM measure in gauging the return potential for a specific real estate investment. The calculation is simply the price paid for the home divided by the annual potential rent produced by the home¹¹. Similar to the P/E ratio for stocks, the GRM provides a relative valuation comparison of the home over time. A GRM calculation found in the lower range of its historical average, or that of comparable homes in the area, implies a potentially good investment opportunity. Likewise, homes with higher GRMs may reflect a fully priced home selling at the upper end of its price range with little value-added appeal.

The second equation records the selling price as the home transitions out of foreclosure at t_4 , or what might be considered the 2nd arms-length-sale in the overall timeline and is specified as follows:

$$\ln(P_{it4}) = (\beta_{0t3} + \delta_0) + \beta_1 X_{it4} + \beta_2 Y_{it4} + \beta_4 INV_{it3} + \varepsilon_{it4} \quad (2)$$

where $Ln(P_{it4})$ is the log of the selling price at t_4 ; $(B_{0t3} + \delta)$ is the intercept plus time dummy representing the intercept at period t_4 ; X_{it4} and Y_{it4} are vectors providing house characteristics and spatial data; and INV is a binary categorical variable capturing whether the home was sold by an owner occupant or investor at t_4 . Since the X_{it} and Y_{it} are assumed time invariant and fixed between sales, they can be written as X_i and Y_i . Differencing equations 1 and 2 gives the following result:

$$Ln(P_{it4}) - Ln(P_{it3}) = [(\beta_{0t3} + \delta_0) + \beta_1 X_i + \beta_2 Y_i + \beta_4 INV_{it3}] + \varepsilon_{it4} - [\beta_{0t3} + \beta_1 X_i + \beta_2 Y_i + \beta_3 GRM_{it3} + \varepsilon_{it3}] \quad (3)$$

And this can be simplified to

$$Ln(P_{it4}) - Ln(P_{it3}) = \delta_0 + \beta_4 INV_{it4} - \beta_3 GRM_{it3} + [\varepsilon_{it4} - \varepsilon_{it3}]. \quad (4)$$

In equation 4 the unobserved effects have been differenced out leaving only GRM and the binary variable Inv . The idiosyncratic error represents the difference between ε_{it4} and ε_{it3} . Differencing out the physical and spatial characteristics between the two sales makes logical sense for two reasons. First, a bank, trust or government entity owns the home during the REO period and has no financial incentive to change the home's current physical design, e.g., room additions, new cabinets, etc. Secondly, neighborhoods typically change over extended periods of time and not in a few months¹². The following section provides the empirical results for home sales between the two time periods, along with descriptive results for periods t_1 - t_4 , or from the first arms-length-sale until the reemergence from distress at the 2nd-arms-length sale.

Empirical Results and Analysis

Ordinary least squares was used to generate the regression results in Table 2 and summary statistics are presented in Table 1. One hundred and eighty six homes were identified as progressing through each of the foreclosure stages from t_1 - t_4 . Similar to earlier studies (Campbell, Giglio, Pathak, 2011) foreclosed homes on average sold for less than county wide averages during each period. From 2000-2007 the average home appreciation rate was 29% for all homes sold in the county and from 2000-2012 homes appreciated 18.8% on average. These results reflect general nationwide trends during the same periods. The mean county-wide home price in 2000 was \$99,723; by 2007 the average county wide price was \$129,074; and, by the first quarter of 2013 the county-wide price had fallen to \$115,866.

Homes transitioning into foreclosure, or from t_1 - t_2 , experienced a -9.78% drop in median selling price at the trustee auction. The mean time between t_1 and t_2 was 5.75 years. Homes moving into REO from t_2 - t_3 experienced an additional -25% decline in median price and on average took 203 days to sell. In total, the median home price declined -33.4% ($SD=20.5\%$) from the first arm's length sale until the REO sale and spanned 8.16 years. The additional drop in median prices from t_2 - t_3 , or the difference in prices from the trustee sale to REO sale, represents underwater homes at the trustee sale where the outstanding mortgage balance was higher than the market value for the home, or that lenders were possibly overpricing homes at the auction sale (Fitzpatrick & Whitaker, 2012). During the trustee sale, the lender typically bids an amount equal to the mortgage balance (Bruggeman & Fisher, 2011), even if home's market value is much less. The data show that homes were falling in price throughout the time period leading up to the REO sale from t_1 - t_3 . Similar to the findings of Harding, Rosenblatt & Yao (2012), the dispersion of foreclosure selling prices was wider than normal arm's length prices during each transition period as noted by the higher standard deviation for foreclosures over normal sales.

Table 1: Summary Statistics

Description	Variable	Mean	Median	25% Quartile	75% Quartile	Mean Home Age at Last Sale in years (t_4)
Sale Price						
1 st Arm's Length Sale (t_1)	ARM-1	\$103,189	\$107,000	\$91,500	\$145,000	13 y
Trustee Sale (t_2)	TR	\$113,432	\$106,000	\$83,000	\$128,000	
REO Sale (t_3)	REO	\$84,574	\$75,000	\$50,000	\$105,000	
2 nd Arm's Length Sale (t_4)	ARM-2	\$116,586	\$113,000	\$77,250	\$136,625	
Change in Sale Price	Variable	Mean	Median	Std. Dev.	Mean Holding Period (d = days) (y = years)	
Arm-1 to Trust (t_1 - t_2)	Arm1-TR	-9.39%	-9.78%	36.4%	5.75 y	
Trust to REO (t_2 - t_3)	TR-REO	-24.13%	-25.0%	24.28%	230 d	
Arm-1 to REO (t_1 - t_3)	ARM1-REO	-34.45%	-33.45%	20.57%	8.16 y	
REO to Arm-2 (t_3 - t_4)	REO-ARM2	46.84%	34.83%	40.36%	305 d	
Arm-1 to Arm-2 (t_1 - t_4)	ARM1-ARM2	-5.75%	-4.37%	27.7%	8.9 y	
Home Price Index (HPI)	Variable	Mean	Median	Std. Dev.		
Δ HPI (t_3 - t_4)	HPI-Change	-1.16%	-.5%	1.8%		
Δ HPI to REO-ARM2 (t_3 - t_4)	HPI-REO-ARM2	47.9%*	36.85%	40.2%		
Investor variables						
Gross Rent Multiplier	GRM	6.45	6.65	2.36		
Investor Binary Variable	INV (Binary)					
Change in Price (t_3 - t_4)	Count	Mean	Median	S.D.	Mean Holding Period (d = days) (y = years)	
Total Homes	186 (100%)	46.84%	34.83%	40.36%	305 d	
Owner Bought Homes	52 (27.96%)	13.85%	6.35%	19.07%	1.31 y	
Investor Bought Homes	134 (72.04%)	56.47%	46.4%	39.64%	254.8 d	
Note: N = 186 $t(183) = 16.06, p < .0001^*$ Avg. Square Footage: 1589						

Table 2: Empirical Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
δ_0	.499	.0554	9.43	<.0001*
INV (Binary)	.215	.0342	6.31	<.0001*
GRM	-.048	.0060	-5.63	<.0001*
Note:				
$R^2 = .451$				
$F(2, 183) = 75.10$				
$p < .0001^*$				
Dependent Variable: $\ln(P_{it4}) - \ln(P_{it3})$				

If REO homes are sold at a discount when compared to sales of similar non-foreclosed homes, then the same REO homes sold arms-length at t_4 should reveal appreciation rates higher than similar non-foreclosed homes. This assumption is based on numerous studies that show REO sales at t_3 sell at discount when compared to arms-length sales. If an arbitrage discount does indeed exist at the REO sale, savvy investors should exploit the price disparity and resell the property at t_4 with a sizable gain. To test this assumption each of the 186 foreclosed homes was compared to the county-wide Federal Housing and Finance Agency's Repeat Sale Home Price Index (HPI) over the same time period. For example, a foreclosed home that sold out of REO inventory on November of 2009 (t_3) and eventually resold as an arms-length sale in October, 2010 (t_4) was compared to the equivalent county-wide HPI repeat sale index for the same period. The results show that foreclosed homes experienced a 47.9%, $t(182) = -11.33$, $p < .0001$, higher mean appreciation rate than HPI index averages during the same period. Again, the variance of foreclosed home appreciation rates was much higher than the HPI index during the period. Median home prices appreciated 36.85% more than equivalent HPI prices, with an average time between sales of only seven months. These findings compare closely with Harding, Rosenblatt & Yao (2012) that show a 33% ($SD = 51.83\%$) excess return for REO homes purchased and then resold within a year. The authors note however that such excess returns were accompanied by much higher risk. As the time between resale increases, excess returns fall, but so does the standard deviation in selling prices. They find that excess returns for homes resold 2-3 years after the REO sale drop to only 4.6% ($SD = 13.71\%$). This study's findings show similar results, however, prices dropped much more slowly with longer times between resale, with excess appreciation rates dropping by 4.2% for each additional year between t_3 and t_4 . Even with the longer resale period, homes resold 2-3 years after the REO sale had excess appreciation rates of 23.8% ($SD = 17.61\%$).

One of the major objectives of the study was to determine the impact investors have on home appreciation rates for homes resold after the REO purchase at t_3 . Of the 186 homes used in the study, 52 were purchased by owner occupants at the REO sale and 134 were purchased by investors. To determine owner occupants from investors, deeds from the county register's office were obtained for each of the 186 homes. Homes where the owner's mailing address was different from the home's physical address were considered investor owned and homes with identical addresses were considered owner occupied. Owner occupied homes experienced a 6.35% median appreciation in selling price from t_3 to t_4 with an average holding period of 1.31 years between sales. Investor owned homes experienced a 46.4% median appreciation rate, with a holding period of only 254.8 days. Similar to the comparison with HPI indexes, the higher appreciation rates for investor owned homes were also associated with much higher standard deviations. Using the Satterthwaite Approximation to test the difference between the two means of unequal sample sizes and variances resulted in a significant difference in appreciation rates between investor owned and owner occupant resells, $t(146) = -9.66$, $p < .0001$. The short duration in holding period for investor owned homes revealed that many of the homes were bought and resold quickly, or more informally "flipped". It is interesting to note that REO homes, both investor and owner occupied, saw price appreciations during the t_3 - t_4 period, while the county-wide appreciation rate at all quintiles, as measured by the HPI index, saw price declines during same time period.

To understand the impact investors have on REO home price appreciation rates, the t_3 to t_4 time period was analyzed through equation 4. Using a log-linear model to control positive skewing of the dependent variable, the equation provided a better overall model fit than a simple linear-linear model. Differencing the two time periods eliminated physical and spatial characteristics from the equation leaving only the INV and GRM variables. As noted earlier, INV is a binary variable that distinguishes investor owned homes from owner occupied homes and GRM is the gross rent multiplier at t_3 , or when the home was purchased out of REO inventory. Combined, the variables accounted for $R^2 = 45.1\%$ of the observed variance in home price appreciation from t_3 - t_4 , $F(2, 183) = 75.10$, $p < .0001$. Interpretation of the log transformed home appreciation rates required transforming unit changes in the predictor parameters to

$(e^{\beta_n} - 1) \times 100$ equivalent percentage changes in the dependent variable¹³. Transforming INV revealed that investor purchased homes at t_3 sold for 24.08%, $\beta_4 = INV = .2158$, $t(183) = 6.53$, $p < .0001$, more than owner occupied homes at t_4 . Transformation of the GRM¹⁴ variable revealed that a one unit increase in the gross rent multiplier was associated with a -4.8% change home prices $\beta_3 = GRM = -.048$, $t(183) = -5.63$, $p < .0001$. Further comparing the GRM for owner-occupied homes to those of investor owned homes revealed a significant difference in GRM's between the two groups, $t(146) = 4.15$, $p < .001$.

These findings validate the existence of a foreclosure discount, which eventually leads to an above normal appreciation when the foreclosure is resold at arms-length; however, these findings do not include or control for rehabilitation costs of the REO property from t_3 - t_4 . Indeed, this single issue underscores the many pro-and-con arguments for or against a discount in the literature and will continue to challenge researchers well into the future (Frame, 2010). We argue that finding such an estimate will always be subjective, and various methodologies are possible. Until recently, prior studies relied on whether the REO property was rated in fair or poor condition (Clauretie & Daneshvary, 2009; Sumell 2009) or possibly vacant when sold (Knight, 2002; Anglin, Rutherford & Springer, 2003; Clauretie & Daneshvary, 2009). To control for rehabilitation expenses, this study uses actual costs from newly formed real estate investment trusts (REIT) buying thousands of foreclosed properties since 2010.

The great rescission of 2008 and the bursting the housing bubble created an abundant supply of foreclosed properties within the United States. To confront the rising supply of foreclosures, the U.S. Department of Housing and Urban Development (HUD) established several REO bulk resale programs to assist in liquidating their supply REO properties (HUD, 2012). At roughly the same time, multiple REITs entered the residential housing and rental market to take advantage of what many, including Warren Buffett, considered a great buying opportunity for homes. Using publically available S-11 registration data from one of these newly formed REITs, American Homes 4 Rent (AMH), actual rehabilitation expenses were extracted from the company's Securities and Exchange (SEC) filing on 9/13/2013. These costs were documented in the company's S-11 filing (American Homes 4 Rent, 2013) and contained the following statements:

The acquisition of properties involves expenditures in addition to payment of the purchase price, including payments for acquisition fees, property inspections, closing costs, title insurance, transfer taxes, recording fees, broker commissions, property taxes and homeowner association ("HOA") fees (when applicable). In addition, we typically incur costs between \$5,000 and \$20,000 to renovate a home to prepare it for rental. Renovation work varies, but may include paint, flooring, carpeting, cabinetry, appliances, plumbing hardware and other items required to prepare the home for rental. The time and cost involved in accessing our homes and preparing them for rental can significantly impact our financial performance. The time to renovate a newly acquired property can vary significantly among properties for several reasons, including the property's acquisition channel, the age and condition of the property and whether the property was vacant when acquired. (p. 63).

As of June, 30, 2013, the company had purchased 18,326 single-family homes throughout the United States. Approximately half of these properties were located in the Southeast with an average house age of 11.5 years. Using the S-11 data, median estimates for holding, rehabilitation and selling costs were documented at \$13,500 per home. As noted in the S-11 filing, the company purchases 3 to 4 bedroom homes that appeal primarily to upper-end tenants looking for more accommodating and larger homes. This compares closely to the 186 repeat sale homes used for this study, which were 102 square feet smaller and 1.5 years older than the typical AMH home. Converting the

median costs per AMH home to square feet equates to \$6.42 per-square foot in additional costs. A percentage of these costs are common for both foreclosure and normal arms-length sales, such as legal, documentation and realtor fees; this implies that the \$6.42 number is actually higher than simple repair and rehabilitation expenses alone. For this study, the higher estimate of \$6.42 per square foot was added to the price of each home and the empirical results reevaluated.

Including the additional \$6.42 in costs to the price of each home at t_4 , or at the first arms-length sale after REO, resulted in the regression results found in Table 3. Back transforming INV and GRM to their percentage change equivalents revealed at 31.4% higher appreciation rate for investor owned homes at t_4 verses owner-occupied homes; and a one unit higher change in the gross rent multiplier resulted in a -2.76% change home appreciation rates. Compared to county returns using the HPI index, a mean difference of 32.88%, $t(183) = -12.036$, $p < .0001$, existed between HPI appreciation rates and REO homes being resold at arms-length at t_4 . Even with the added rehabilitation costs and transaction fees, homes emerging from foreclose appreciated significantly more than similar non-foreclosed homes. Secondly, the findings support the earlier work of Gerardi, et al. (2012) and confirm that investors are willing to internalize the costs needed to eliminate physical deterioration and differed maintenance found with foreclosures in the pursuit of an eventual return on their investment.

Table 3: Empirical Results with Rehab Costs

Variable	Coefficient	Std. Error	t-Statistic	Prob.
δ_0	.216	.0659	3.28	<.0001*
INV (Binary)	.273	.0407	6.71	<.0001*
GRM	-.028	.0072	-3.9	<.0001*

Note:
 $R^2 = .441$
 $F(2, 183) = 69.60$
 $p < .0001^*$
Dependent Variable: $\ln(P_{it4}) - \ln(P_{it3})$

Study Limitations and Future Research

One of the more obvious limitations of the study was limiting it to only one county. As separate governing entities, each county establishes their own processes for implementing state foreclosure laws. For example, Johnston County, the county included in the study, uses separate data repositories for deeds, tax and GIS information; in such instances, aggregating the data was prohibitively time consuming. Add multiple counties, all with differing processes and technologies, and the research effort becomes even more onerous. This apparent opaqueness of foreclosure information may also contribute to the thin market conditions at the trustee auction (Newman, 2010), and thus serves as a further research area.

Many of the homes sold as REO sales were never resold or have yet to transition into an arms-length to arms-length sale at time period t_4 . Subsequently, as these homes are eventually resold, prices may vary from the results found in the study. The study shows that home price appreciation rates approach normal market rates the longer the home is owned after the REO sale.

Suggestions for future research include conducting the study in differing regional areas to confirm the empirical results. A second suggestion would be to investigate the four panel pricing process during both up and down cycles of the housing market. The t_3 - t_4 period of this study, or the period between the auction sale and REO sale, represented at time of falling home prices. Future research could investigate periods of appreciating home rates and compare them to markets when prices are trending downward, such as Chau and Ng's (2008) similar work for the Hong Kong market.

Conclusions and Suggestions

This study examined home price appreciation rates for foreclosed residential properties within Johnston County, a county within the Raleigh-Cary Metro area of North Carolina. Using a repeat sales, panel data methodology, 186 homes were tracked over a time period spanning on average 8.9 years per home. The findings show that homes falling into foreclose depreciate in price faster than normal arms-length homes during the same period. Foreclosed homes depreciated in price by 9.78% between the first arms-length sale and auction sale, and dropped another 25% when sold at REO. In total, foreclosed homes lost approximately 34% of their value by the time of the REO sale. Similar results were found by Pennington-Cross (2006) during a period when homes were appreciating in value. His results showed that foreclosed home values appreciated more slowly than average area appreciation rates. The difference in appreciation rates was due primarily to housing conditions, legal constraints and loan considerations. Both studies combined, show that foreclosures appreciate less in up markets and depreciate faster during down markets.

In contrast, homes emerging from foreclosure after being sold out of REO experienced significantly higher price appreciation rates than similar non-foreclosed homes during the same time period. Compared to county returns using the Federal Housing and Finance Agency's Repeat Sale Home Price Index (HPI) index, homes sold after being purchased from REO appreciated 32.88%, $t(183) = -12.036$, $p < .0001$, more than HPI appreciation rates during the same time period. Foreclosed homes completing the foreclosure cycle regained most of their original value with prices mean reverting to comparable arms-length sales within the same area.

Appreciation rates for foreclosed REO homes bought by investors were found to significantly outperform owner occupant homes during the study period. These small scale investors were generally LLCs, real estate brokerages, residential contractors and what many would consider small "mom-and-pop investors". The findings validate earlier work by Gerardi et al (2012) and show the willingness of investors to take on greater risks in order to eventually resale the property for a profit. Actual repair estimates obtained from a major residential REIT revealed an additional \$6.42 per square foot was required to bring a typical foreclosed home up to market-sale conditions. Even when including the extra repair costs, investor-owned REO homes appreciated substantially more than county wide averages for non-foreclosed homes during the same period.

Several commercial and policy-related issues are apparent from the study. First, starting bids for homes sold at the county auction were higher than true market valuations. Fitzpatrick and Whitaker (2012) find that lenders inappropriately value foreclosed homes and overprice homes at the auction sale. The consequences of such overpricing lengthen the amount of time homes languish unsold and further perpetuates a home's poor physical condition. Instead of setting minimum bids at or near the mortgage balance, lenders should adjust the price to reflect true market-based valuations. Doing so, would incentivize investors to purchase homes during the auction sale, rather than much later at the REO sale. Since investors approach the buying process differently than owner-occupants, appraisers should weight appraisals more heavily towards income valuation methods instead of sales comparison methods. As shown in this study, a simple income-based valuation metric, the gross rent multiplier,

captures relative valuations based on the income potential of each property. Additional income-based metrics, such as capitalization rates and cash-on-cash return to equity could also be advantageous when the buyer pool is more investor centric.

Secondly, these findings support the recent work of Gangel, Seiler and Collins (2013) and show the time a neglected foreclosure lingers on the market impacts neighboring home values more than actual physical externalities. This is important since many of the forbearance and loan modification programs created in the aftermath of the financial crisis, such as the Home Affordable Modification Program or HAMP, were intended to curtail foreclosure rates and stabilize deteriorating home prices. The goal of such programs was to reduce the home owner's principle mortgage balance thereby lowering the required monthly payments; however, recent reports have revealed such mitigation strategies may have worked to prolong the time many homes languish in pre-foreclosure before succumbing to eventual foreclosure anyway (Sigtar, 2013). Such programs work in opposition to the findings in this research, which suggest a quicker disposition rather than a longer disposition process may be more beneficial. As this study seems suggest, small scale investors serve a vital role in reducing the time a home remains in foreclosure; these mom-and-pop enterprises accept the risk required to eliminate deferred maintenance found with the home. To that end, their risk-taking efforts contain falling neighborhood home prices, shorten the foreclosure cycle and lessen the impact of negative externalities on adjacent homes.

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Endnotes

¹ The foreclosure process described refers only to the state of North Carolina and predominately the Trustee Sale Process.

² In North Carolina such firms as Brock and Scott PLLC; Shapiro and Ingle PLLC; Rogers, Townsend & Thomas PC and Hutchins and Sentor PLLC make a market in handling foreclosures.

³ Normal homes sales are typically transacted by owner occupants selling to other potential owner occupants.

⁴ An underwater homeowner is when the home owner's house value is worth less than the outstanding mortgage on the home, or when the loan-to-value (LTV) is greater than one. Although most home owners never succumb to foreclosure when underwater, the number of foreclosures generally increases when homeowners owe more on the mortgage than the home is worth.

⁵ The asset moves from the non-performing loan pool to the OREO or REO physical asset pool on the balance sheet.

⁶ Holding cost can include insurance, maintenance costs, taxes, time-value of money holding costs, brokerage fees and attorney fees.

⁷ Indeed, private companies now create automated valuation models (AVM) that can be cascaded to capture unique valuation differences for specific market or demographic situations.

⁸ Note however that these attempts exclude a full property appraisal where a human actually goes inside the property.

⁹ Support for this study would not have been possible without the effort of GIS and tax administrators from Johnston County geographical mapping and tax departments.

¹⁰ Physical changes include items that would have changed the assessed value of the home, such as added square feet, remodeled rooms, garage additions, etc. New county-wide appraisals were conducted near the end of the study, so comparisons were made of pre and post appraisals to find any changes. Homes that could not be verified by record, thirty six homes in total, were physically inspected, either by contacting the owner or visiting the location to ensure no physical changes had occurred during the study period.

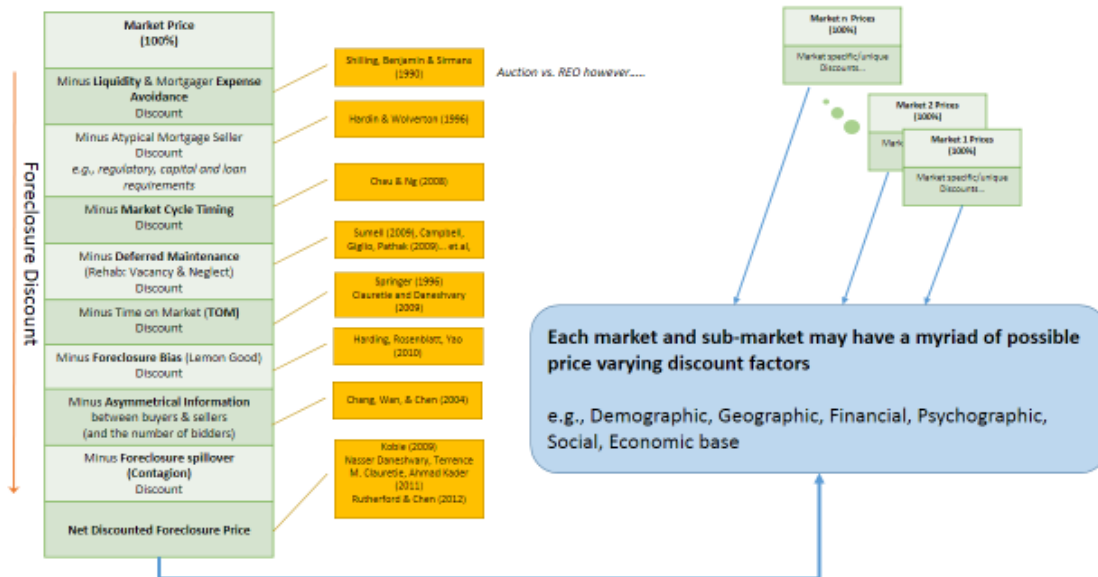
¹¹ Rent rates were obtained from Zillow.com, which supplies rental estimates at the neighborhood level.

¹² The average days on market (DOM) for an REO in North Carolina is approximately 250 days.

¹³ To interpret dependent log transformed variables, the predictor coefficients must be back transformed to interpret the original percentage change format. This is usually done by exponentiation of the coefficient using $(e^{b_1} - 1) \times 100$, or approximately $100b_1$.

¹⁴ Gross Rent Multiplier uses the annual rent divided by the price of the home to determine a yield value for the property. Rent area data was obtained from Zillow.com, which carries rent data for the house, community and neighborhood.

Appendix 1: Foreclosure Discount Stack



Appendix 2: Actual Investor Owned REO Sale

Foreclosure Sale discount vs. Arms-Length Sale

100 Ridge Trial
Sold for **\$64k**
Sold - May 2013

Foreclosure

Inside Foreclosure

Back of Foreclosure

131 Ridge Trial
Sold for **\$112k**
Sold - Feb- 2013

Arms-Length Sale

Both homes are adjacent to one another

$\$112 - \$64k = \$48k$
Contractor rehab costs \$15k
Net difference: \$33k
or **29%** foreclosure discount....

Deferred Maintenance and Investment Externalities