

## **A Look at Another Stage of the Distressed Inventory: The Number of Properties with Negative Equity**

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One of the major topics in today's discussion of housing markets pertains to the role of the inventory of distressed real estate. At a high level, this inventory is hindering the full recovery of the housing market and generating substantial challenges for, current market participants. Answers or insights about these questions rest, first and foremost, upon accurate estimates of the size of the inventory and the mechanisms available to reduce the size of the distressed inventory.

Our January article offered an overview of the three stages of the distressed inventory. One stage consists of those properties in which borrowers have negative equity and are facing the decision of whether or not to default on their mortgages. A second stage consists of properties that have gone into default and are facing the prospect of foreclosure. A third stage consists of properties in which foreclosure has already taken place and they are awaiting transition back to the market via an REO (real estate owned sale). We offered estimates of the size of the Stage 3 inventory for eight counties in New York and California and highlighted the variation among local markets.

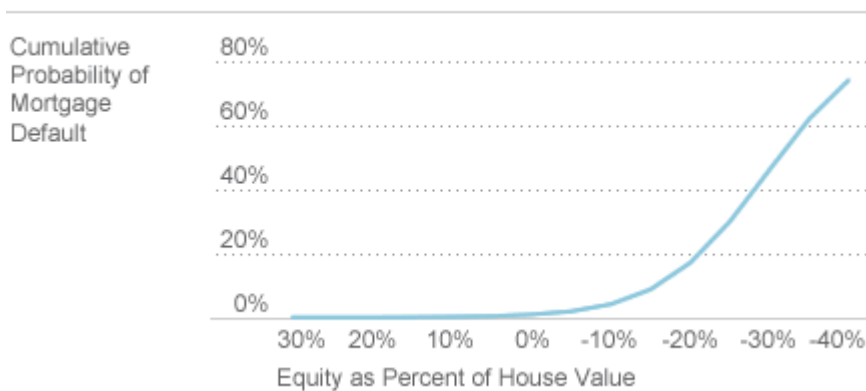
This article focuses upon the first stage: the number of properties with negative equity. These properties are considered as distressed because substantial evidence has been accumulated for two decades showing that the main driver of serious mortgage delinquency and default is the amount of owner equity in the property. Some of the evidence is theoretical. When faced with changes in income and employment circumstances, borrowers with substantial equity are better off selling the property, paying off the existing debt, and move to a less expensive home as opposed to defaulting on the mortgage and incurring the negative impacts of such a decision on the borrower's credit score.

Some of the evidence is empirical. The following graph captures a widely agreed upon relationship between the amount of equity in a property and the probability that a borrower will default on his or her mortgage. The exact amount of negative equity that leads a borrower to "walk away" or "turn in the keys" to the lender does vary among borrowers. A typical pattern is a sharp increase in the probability of default as soon as equity becomes negative, and then it rises more and more steeply as equity becomes more and more negative. If negative equity is -40 percent of the property value, the probability of default is in excess of 75 percent.<sup>1</sup>

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<sup>1</sup> This graph is built upon a credit risk model developed and used by Follain and Sklarz (2005).

### Cumulative Probability of Foreclosure



### American Housing Survey Based Estimates of the Number of Properties with Negative Equity.

A recent study by Carter (2012) offers measures of the number of properties with negative equity.<sup>2</sup> The analysis used data from the American Housing Survey (AHS) for 1997 through 2009. The study concludes that the size of this inventory has risen substantially in recent years. In the years prior to the housing bust of the last 2000s, the percent of the inventory with negative equity ranged from 3.58 percent (2001) to 5.12 percent (2003). The percent of the inventory with negative equity more than doubled to 11.59 percent in 2009. The study also offered a number of insights about the distribution of the properties with negative equity and the challenges in measuring them. Among the most important are these:

- The AHS based estimates rely upon the owner-occupants estimates of home values, which are thought by many to lag changes in the market value during periods of rapid market decline. The study offers adjustments designed to take account of a potential upward bias associated with owner estimates of value. It relies upon the Case-Shiller price indexes for these adjustments. These adjustments are substantial in later years. For example, the size of the stage 1 inventory of distressed real estate for 2009 increases from 11.59 percent to 16.40 percent.
- The AHS estimates are much smaller than the estimate generated by Core Logic, which estimated that 23 percent of the inventory had negative equity in 2009. The difference is attributed to differences in “the methodologies AHS and Core Logic use to measure negative equity and the housing population they cover in their estimates.”
- The AHS data provide the opportunity to examine variations in the number of properties with negative equity for a number of household categories and mortgage types. For example, minority, younger households, and borrowers with adjustable mortgages are much more likely to have negative equity.
- The AHS offers very little insight regarding geographic variations in the incidence of negative equity. Information is provided for the four census regions. It is highest in the West in 2009 (15.87 percent) and lowest in the Northeast (7.49 percent).

<sup>2</sup> See <http://www.huduser.org/portal/periodicals/cityscape/vol14num1/ch7.html>

The paper contains estimates for a variety of other portions of the population and the housing stock.

## **New Measures of the Number of Properties with Negative Equity from Collateral Analytics**

Here we use data generated by Collateral Analytics (CA) to estimate the number of properties with negative equity for 2005 through 2011. The process underlying these estimates is as follows. The population of single family residential properties is constructed in 2005:Q1 and is the focus of the measures for each subsequent quarter. A property with negative equity is determined by comparing CA's AVM estimate for each property to the size of the mortgage associated with the property at origination. No adjustments are currently made to principal reductions or for additional debt since origination. If the AVM estimate is below the initial mortgage, the property has negative equity.

As in our January article on this topic, attention is focused upon eight counties. Four are downstate New York counties: Nassau, Suffolk, Ulster, and Westchester; and four are counties in the Eastern parts of California that have been hit very hard by the crisis: Merced; Riverside; San Bernadino, and San Joaquin. We also provide information at the zip code level for selected years within these counties. A goal is to both examine and highlight the wide variations in the size of the stock with negative equity among local housing markets and the potential role played by state foreclosure laws and policies.

The first look at these data focuses on the percent of the stock of single family residences with negative equity (See Figure 1) from 2005:Q1 through 2011:Q4. The fraction of these properties with negative equity is below 5 percent for all eight counties in 2005 but then begins to rise rapidly, especially in the four California counties. The peak rates were achieved in the four California counties in the latter half of 2009 and early 2010. The highest rates were in Merced (33.1 percent) and San Joaquin (33.1). The rates have declined in each of these counties since 2009 though they remain well above pre-crisis rates. The rates for the four New York counties continued to rise through 2011. The highest are in Ulster (8.2 percent) and Nassau (5.9 percent). Note the dramatic increases in each of these counties since the beginning of the crisis. The rate is ten times higher than the 2005 rates for Ulster and 20 times higher in Nassau.

The size of the inventory with negative equity is also computed for each of the 500+ zip codes in these eight counties for the same time period. The results are presented in Table 1 for the ten largest zip codes in each of the eight counties for 2009:Q1 and 2011:Q1 along with the simple averages of the values for these ten zip codes. These results confirm the large increases in the share of properties with negative equity between 2007 and 2011 in most zip codes. The 2011 rates are usually three to six times larger than the 2007 rates. One outlier is zip code 11717, which is located on Long Island. The percent of the stock of SFSR units increased from 0.5 percent to 8.5 percent between 2007 and 2011 and offers an example of a place outside of the SAND states hit very hard by the current crisis. Another main takeaway of the table is the wide variation among the zip codes around the averages for both years. Riverside and San Bernadino counties have a relatively large dispersion around their county averages. For example, 35.7 percent of the units in zip 92563 from Riverside have negative equity in 2011 compared to only

7.9 percent in zip 92399. The wide variability among zip codes is also captured in Figure 4, which maps the Stage 1 measure of distressed real estate for zip codes in Nassau County, NY as of July 2011. Notice the relatively low rates in the north end of the county relative to other parts. The highest rates are in and around Hempstead, NY.

## Drivers of the Share of Properties with Negative Equity

What are the main drivers that affect the Stage 1 inventory of distressed real estate? One obvious driver is the behavior of house prices. Substantial declines in house prices, all else equal, can lead to more properties with negative equity. The pattern is demonstrated by plotting the median sales price per square foot of properties sold by regular and Real Estate Owned (REO) sales. Indeed, the data offered in Figure 2 capture the large declines in house prices experienced within these counties, especially the four California counties. Prices are half of what they were at the peak in the four California counties. The four New York counties also experienced price declines since reaching their peaks in 2006 and early 2007. Though the magnitudes of these declines were smaller in the New York counties than in California counties, prices at the end of 2011 were about 20 percent below their peak values in three of the of the New York counties (all but Westchester).

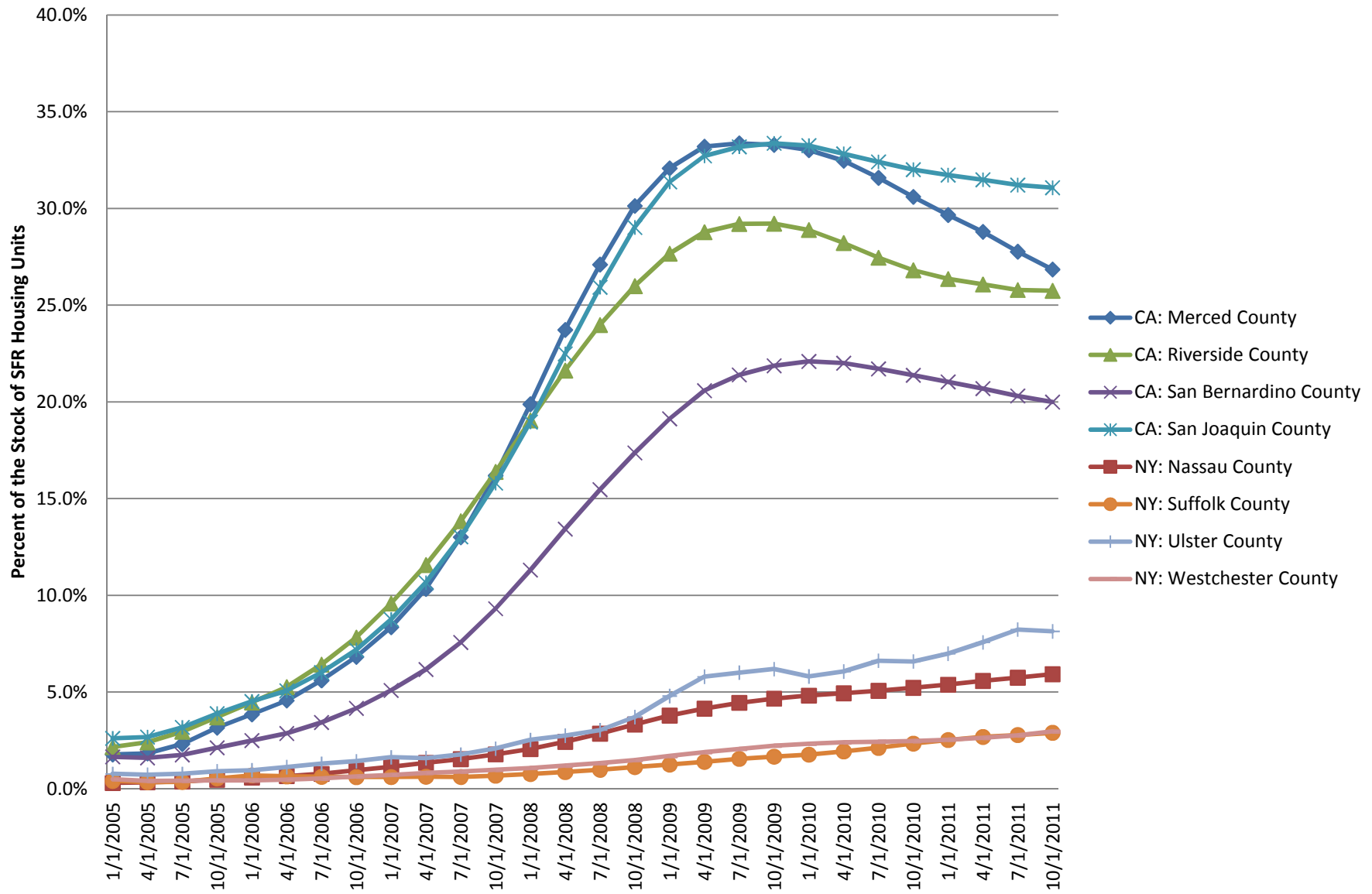
The other and perhaps more interesting and complex set of factors pertain to the various ways in which borrowers adapt to a negative equity position. Collateral Analytics has developed a set of metrics that captures the evolutionary process, including the number of properties in Stage 1 that ultimately become foreclosures, REO sales, refinances, short sales, and those in which the property continues to have negative equity and has experienced no further transaction. Future articles will present these data. Here attention is focused upon the latter category: the fraction of the inventory with negative equity at the start of a period that still has negative equity as of the end of 2011. These data are presented in Figure 3.

The strong upward trend in this component of the data reflect, in part, the fact that the data are tracked until the end of 2011, hence the inventories in the 2010 and 2011 have had much less time to adjust than the inventory in earlier years. Nonetheless, the graph offers insights about the cross-section variation. Consider, for example, the cases of San Bernadino and Suffolk County in 2009:Q2. 45 percent of the San Bernadino properties with negative equity in that period are still counted among the inventory with negative equity and have not left this stage by foreclosure, short sale, or any of the other options tracked in the data. The number in Suffolk County is substantially higher at 76 percent. One likely explanation is that the foreclosure process itself is much slower in New York State than in California, which increases, all else equal, the properties that remain in stage one of the distressed inventory.

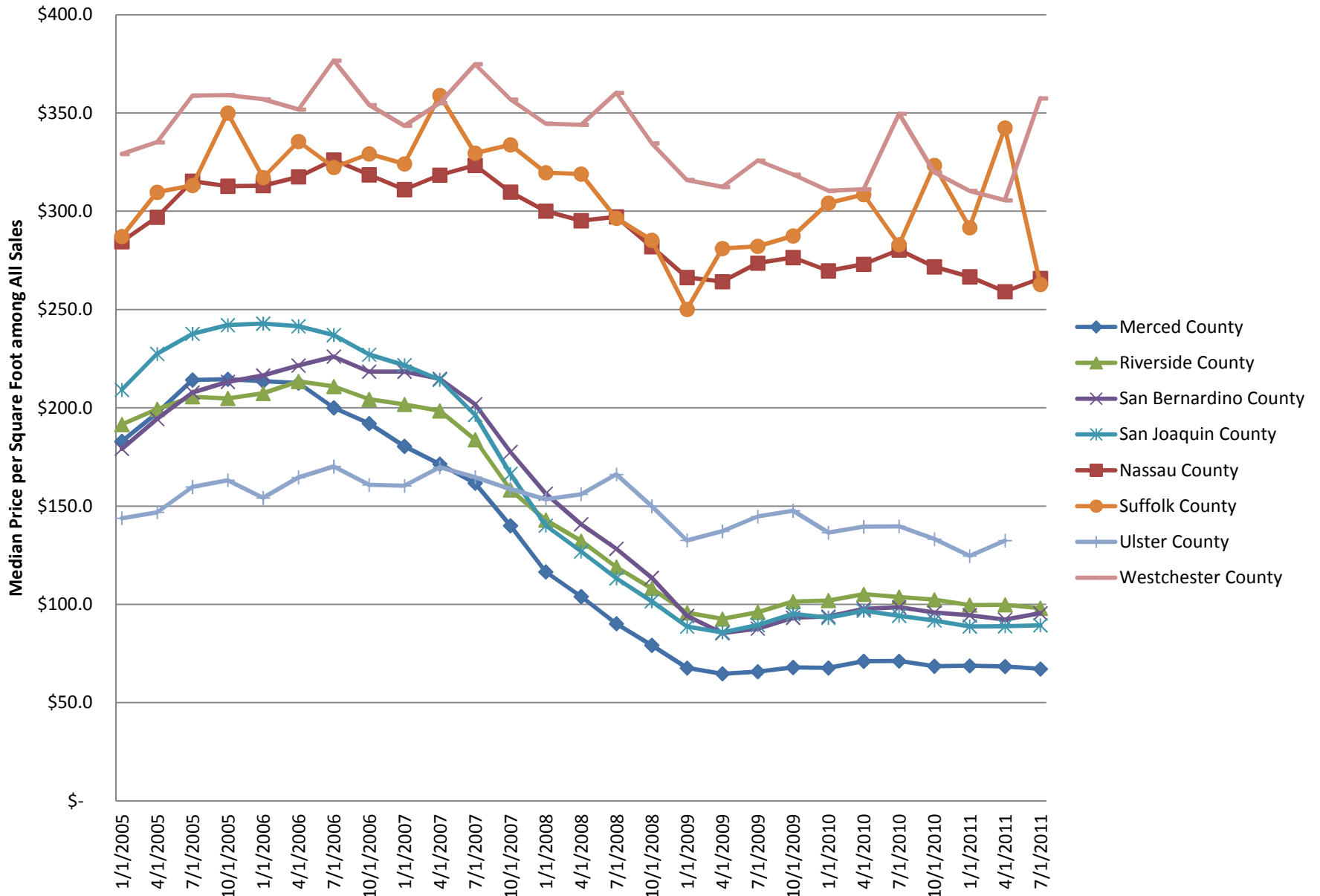
## What Next

A top priority is the analysis of the various ways in which the inventory of properties with negative equity evolves. This will be the subject of a future article. Another important next step is to link these data and measures to the ongoing policy debate about the best ways to dissolve the inventory of distressed real estate. As noted in the January article, this process has become

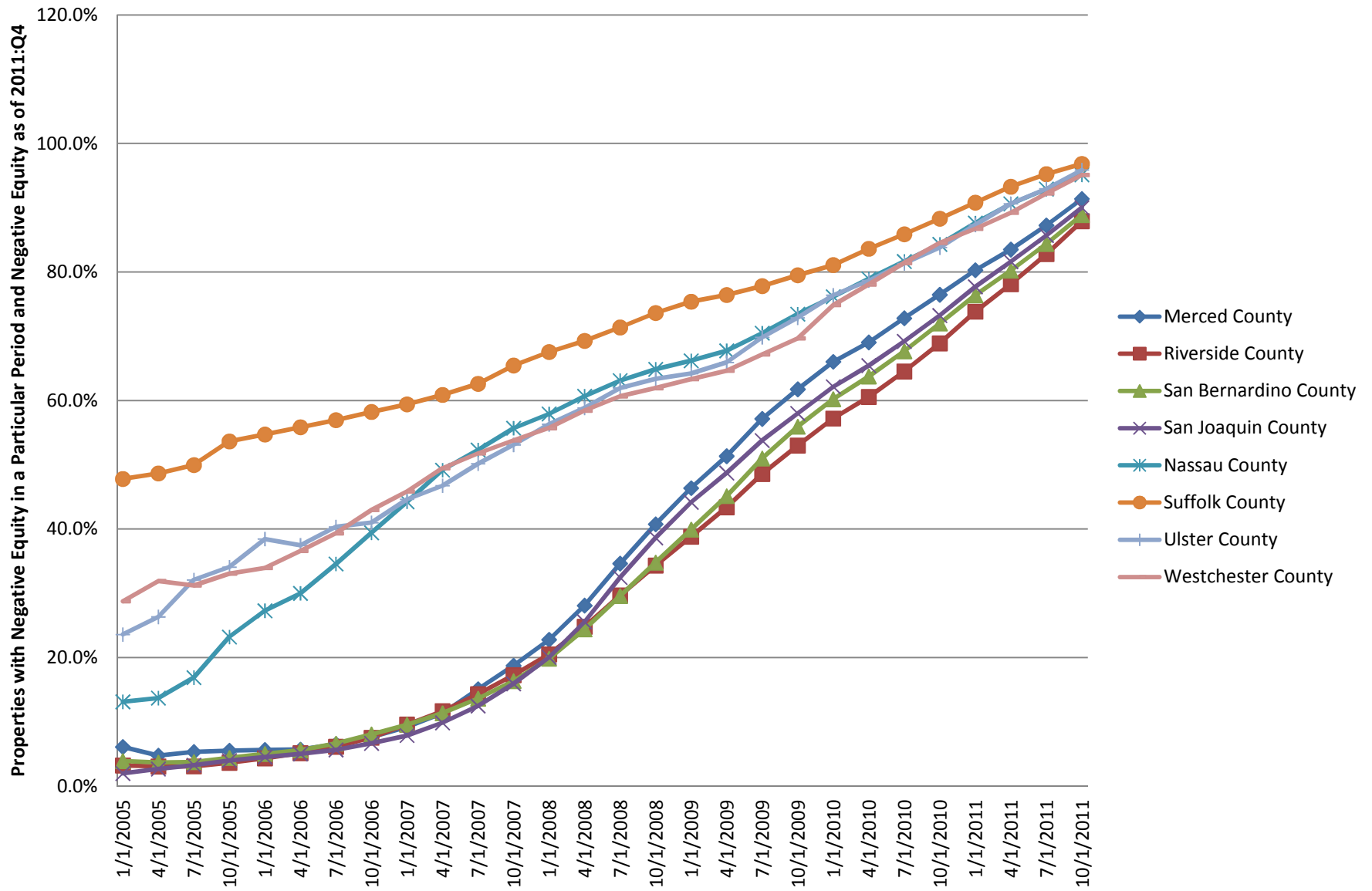
### Figure 1: Estimates of the Percent of the Single Family Residential Stock with Negative Equity



### Figure 2: Median Sales Price per Square Foot for Eight Counties



**Figure 3: Percent of Properties with Negative Equity with No Change in Status**







**Table 1: Percent of SFSR Properties with Negative Equity**

**Ten Largest Zip Codes in the Eight Counties**

	2007	2011	Ratio		2007	2011	Ratio
<b>Merced County</b>	<b>8.7%</b>	<b>30.9%</b>	355%	<b>Nassau County</b>	<b>1.4%</b>	<b>5.8%</b>	423%
93635	12.1%	35.0%	290%	11510	2.3%	12.4%	537%
95348	10.2%	34.0%	332%	11590	3.9%	9.9%	251%
95315	10.0%	35.7%	359%	11756	1.5%	9.4%	625%
95341	9.0%	32.1%	355%	11801	0.8%	5.6%	663%
95388	10.7%	32.6%	304%	11554	0.9%	5.2%	553%
95322	6.9%	33.1%	481%	11793	0.9%	3.4%	364%
93620	8.5%	29.6%	349%	11758	0.9%	3.3%	378%
95301	6.5%	28.4%	439%	11710	0.7%	3.7%	521%
95334	8.7%	25.7%	297%	11566	0.8%	2.6%	329%
95340	4.7%	23.3%	498%	11040	0.8%	2.0%	269%
<b>Riverside County</b>	<b>8.0%</b>	<b>21.1%</b>	264%	<b>Suffolk County</b>	<b>0.5%</b>	<b>3.0%</b>	556%
92563	15.9%	35.7%	225%	11717	0.5%	8.5%	1716%
92880	13.2%	26.3%	199%	11706	0.8%	4.6%	544%
92592	10.2%	25.7%	252%	11772	0.7%	3.4%	458%
92553	9.3%	25.3%	273%	11704	0.5%	3.1%	650%
92562	9.0%	25.6%	283%	11779	0.5%	2.7%	502%
92503	8.3%	21.4%	258%	11757	0.4%	2.8%	653%
92882	8.4%	17.8%	213%	11746	0.8%	1.9%	235%
92509	5.6%	19.8%	351%	11743	0.6%	1.2%	199%
92253	3.9%	15.3%	391%	11787	0.3%	1.5%	516%
92506	3.0%	11.6%	386%	11937	0.2%	0.2%	150%
92399	1.1%	7.9%	700%	<b>Ulster County</b>	<b>1.4%</b>	<b>6.8%</b>	471%
<b>San Bernardino County</b>	<b>7.5%</b>	<b>22.4%</b>	299%	12401	2.4%	10.8%	441%
92392	10.3%	40.3%	392%	12446	3.0%	8.9%	300%
92880	22.2%	22.2%	100%	12528	1.5%	10.8%	706%
92336	8.7%	26.3%	303%	12542	1.4%	6.7%	495%
92345	5.9%	29.2%	492%	12566	1.1%	6.6%	616%
92346	7.3%	24.4%	337%	12477	1.3%	6.1%	489%
92307	4.5%	24.2%	542%	12443	0.9%	4.6%	533%
92509	9.5%	19.0%	200%	12498	0.9%	4.3%	500%
92335	6.0%	20.9%	348%	12589	1.0%	4.0%	384%
92376	4.8%	20.2%	419%	12561	1.0%	4.8%	492%
92399	4.5%	21.5%	482%	<b>Westchester County</b>	<b>0.5%</b>	<b>2.1%</b>	403%
91710	3.5%	12.7%	362%	10562	1.1%	5.6%	491%
91709	2.7%	7.4%	272%	10573	1.3%	2.9%	218%
<b>San Joaquin County</b>	<b>8.3%</b>	<b>31.6%</b>	382%	10567	0.9%	3.9%	428%
95377	10.1%	44.6%	444%	10598	0.4%	2.3%	621%
95206	11.7%	38.2%	327%	10710	0.3%	2.2%	680%
95209	8.6%	37.8%	440%	10605	0.3%	1.7%	558%
95337	7.2%	37.4%	516%	10583	0.3%	0.9%	315%
95376	9.5%	32.8%	347%	10804	0.2%	0.8%	389%
95336	6.8%	29.4%	430%	10708	0.2%	0.5%	222%
95205	9.0%	25.2%	279%	10580	0.2%	0.4%	233%
95240	8.5%	25.8%	303%				
95204	6.0%	23.1%	387%				
95207	5.4%	21.4%	400%				

much more complex than the one incorporated into most models of credit risk prior to the bubble bust. A much wider set of options is available today and the process has been slowed down due to a variety of policy interventions and market developments. Our expectation is that geographically granular data of this type may be able to shed light on state and local policies that may be helping and hindering, especially in the areas with the largest inventories of distressed real estate and where the external costs of foreclosed and vacant properties are likely the highest.