

Shadow Inventory Absorption Model

Carwin projects distressed housing absorption for Las Vegas

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At the end of the third quarter of 2011, Standard & Poor's estimated that the balance of shadow inventory or the pending housing supply throughout the U.S. had shrunk to approximately \$384 billion, from an estimated \$405 billion at the end of the past quarter. Despite the recent stability these distressed loans continue to loom over the housing market and threaten to further depress home prices.

In this paper we have introduced a predictive model that Carwin developed, with

significantly conservative assumptions, to calculate the months needed to absorb this shadow inventory of housing stock. We have elucidated this model with the help of data from Las Vegas, a metropolitan area currently leading the nation in mortgage defaults and foreclosures.

Carwin's analysis of the Las Vegas housing market forecasts a future that is significantly more positive than is usually perceived amidst shock-driven media reporting. We have thoroughly and

exhaustively analyzed key variables and their relationships to predict both supply and demand for Las Vegas. We have aggressively estimated supply of distressed housing stock and projected absorption for the same. We estimate that the Las Vegas housing market will revert to a more normal environment with levels of new and resale housing sales similar to that of early 2000's

by late 2016. We have been very aggressive with our estimates of distressed, shadow inventory and feel confident that our projections for

disposition of this stock, as detailed in this paper, are fairly conservative.

WHAT IS SHADOW INVENTORY

Shadow inventory refers to the number of real estate properties with underwater mortgages in excess of the current number of homes listed for sale, which will likely come into the market. The shadow inventory can also be referred to as pending housing supply. CoreLogic, a leading provider of real estate analytics, estimates

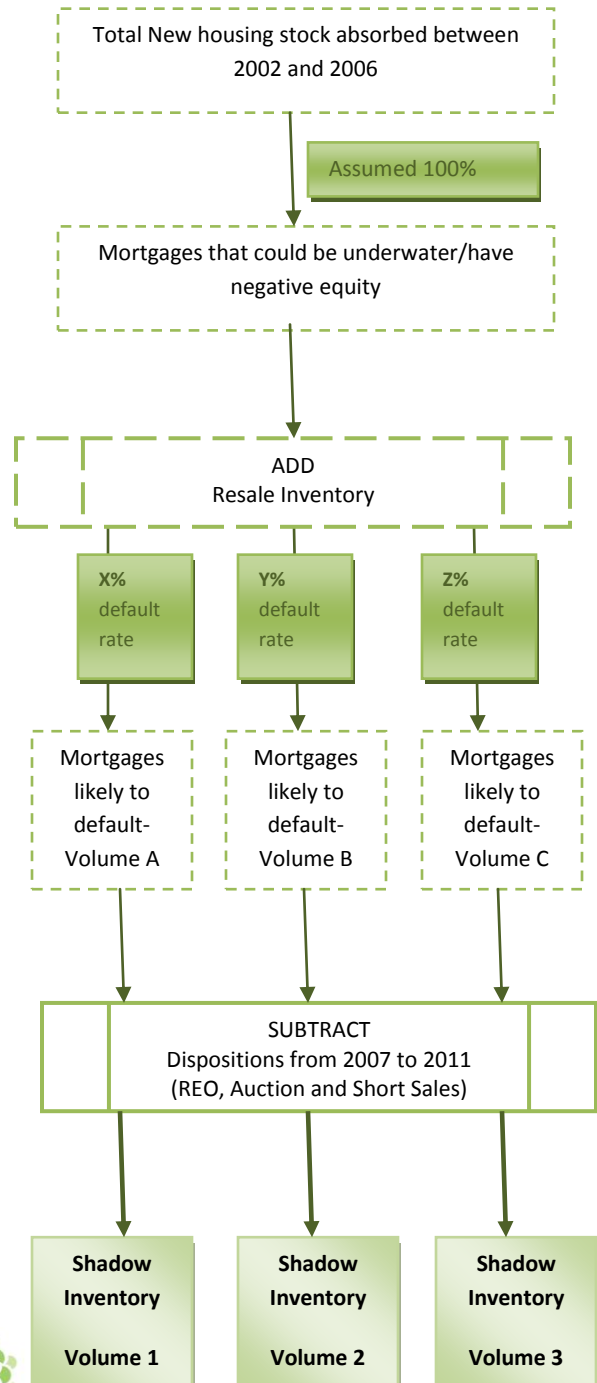
Carwin projects that distressed housing stock including shadow inventory of properties with negative equity will be completely absorbed and flushed out by the end of 2015.

this pending supply by calculating the number of distressed properties not currently listed on multiple listing services that are seriously delinquent (mortgages are late by 90 days or more), in foreclosure or real estate owned (REO) by lenders. They utilize transition rates to identify the currently distressed non-listed properties most likely to become REO properties.

CARWIN'S ESTIMATION APPROACH

In this paper Carwin utilized a significantly aggressive approach to determine the current stock of shadow inventory for Las Vegas. Instead of using delinquent mortgages to calculate the pending supply we are considering all the new home sales between 2002 and 2006 as potentially at risk of default. We are adding a fairly large volume of resale housing stock to this number to estimate the total inventory that is at risk of default. We are then using considerably higher rates than normal to estimate the properties that will become real estate owned by lenders. The calculation factors in three different default

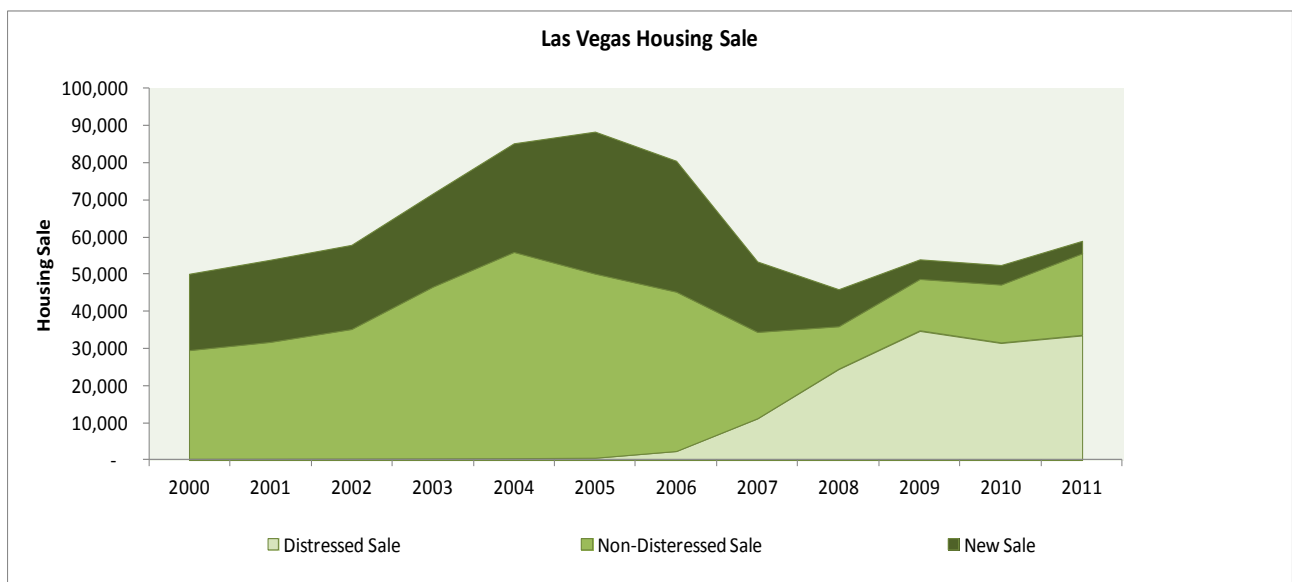
rates to determine a range of likely pending supply. This range of shadow inventory feeds into the model (discussed later) to output several scenarios of complete absorption of this distressed housing stock.



LAS VEGAS – 2000 to 2011

The housing market in Las Vegas has witnessed significant upheaval in the last few years. In a normal market, new home sale and regular resale have shared a fairly constant ratio to each other. In Las Vegas in the first years of this century and in the 1980s and 1990s, resale represented 60% of the total market. In the late 2004, the new home market started booming and new home sale starting encroaching into the resale market share. In 2007 the foreclosed housing inventory started flooding the market and absorbing bulk of the housing demand.

The distressed housing stock represented 65% of all sales or closings in Las Vegas in 2009, squeezing the new home market share to 10%. By the end of third quarter of 2011, the new home market share was 6%, losing to non-distressed resale that showed a slight uptick. The overall housing demand (sum of distressed, non-distressed and new sale) has been declining since the 2005 peak of over 80 thousand closings. However, the decline is not as large as it is made out to be in the media. The current volume of closings is about 75% of the 2005 numbers and, as noted in the chart below, about the same as early 2000s – it is just that distressed sales have largely replaced new home sales!



CARWIN'S PREDICTIVE ABSORPTION MODEL

Once a range of pending supply is established, Carwin analyzes several key drivers of demand to establish range of absorption or closings. An exhaustive analysis of historical data indicates very strong correlation between housing demand and population and employment growth. In fact, we can statistically calculate ratios of housing demand to changes in population and employment for all metropolitan areas. These ratios, when tested, seem to be valuable variables in making demand projections for the future.

For Las Vegas, we analyzed the following parameters that we consider critical drivers of the housing market:

- Historical absorption of distressed housing stock in the area (2010).
- Employment projections for the Las Vegas Metropolitan Statistical Area from the Bureau of Labor Statistics.
- Population projections from United States Census' population division.

- Historical employment and population data and the correlation with the housing market to establish a range of ratios that can be applied to predict housing demand.
- Resale to new housing demand ratio.
- Health of key economic drivers and third party projections for the next few years.

Carwin factored in all the components listed above to calculate the annual demand for housing in the Las Vegas metropolitan area. We then reduced the annual demand to account for non-distressed housing absorptions.

Using the aforementioned ratios we developed three demand scenarios – significantly less than our prediction, on our prediction and slightly over our prediction.

The model used the three shadow inventory estimates and applied the three predictions of demand. This results in nine scenarios of when the distressed inventory will be completely disposed.

Based on methodology explained above Carwin’s model estimates that Las Vegas’ distressed housing inventory will be absorbed in the next 5 years or less.

Carwin predicts the following months of supply of distressed housing stock for Las Vegas:

Supply → Demand ↓	Shadow Inventory Volume 1	Shadow Inventory Volume 2	Shadow Inventory Volume 3
Demand Scenario 1 (Lower than prediction)	32	53	73
Demand Scenario 2 (Prediction)	26	42	58
Demand Scenario 3 (Higher than prediction)	23	38	53

Once this stock is flushed out and reabsorbed in the market, new housing activity will likely rebound and the negative pressure on pricing will be reduced. The chart below is a graphical representation of Carwin’s projection for the break out of demand within the three buckets. The new home market share starts to increase as the distressed inventory is absorbed by 2016. The non-distressed resale will represent a larger share of the market as lower priced distressed stock will compete with new home supply, however new home market will be in very healthy recovery by or before 2017.

