



Zillow® Home Value Index

The Zillow Home Value Indices (ZHVI) are the most accurate and timely measures of residential real estate prices in the United States. The indices are available for more than 350 metropolitan statistical areas representing more than 95% of the total housing stock by value. The index family includes breakdowns by different geographic units, from neighborhoods to counties to the entire country. The ZHVI are also available for home type, price tier and number of bedrooms. The indices are available more than a month before other indices for the same reporting period, making the ZHVI the leading indicator of housing prices.

Living Database of Homes

At the core of the ZHVI is Zillow's proprietary "living database" of more than 110 million homes. The database integrates information from disparate sources, including prior sales, county records, tax assessments, real estate listings, mortgage information and GIS data. As a consumer-facing company, our database is enriched by homeowners who have claimed their homes on Zillow and edited home facts. Data on more than a third of homes in our database have been updated by users, giving Zillow a much better picture of the housing stock than is provided by public records alone.

From Data to Zestimate®

For more than 100 million homes, Zillow calculates a Zestimate, an estimate of value for each home. The Zestimate is based on a suite of sophisticated "automated valuation models" (AVM). The models are re-trained three times a week based on the latest data, and each home's Zestimate is updated daily. Zillow is the only firm to publish both the accuracy of its AVM's and the entire valuation history for each home. The Zestimate is unbiased for each region and price tier, meaning just as many Zestimates are likely to be higher than the actual value of the home as they are likely to be below the value.

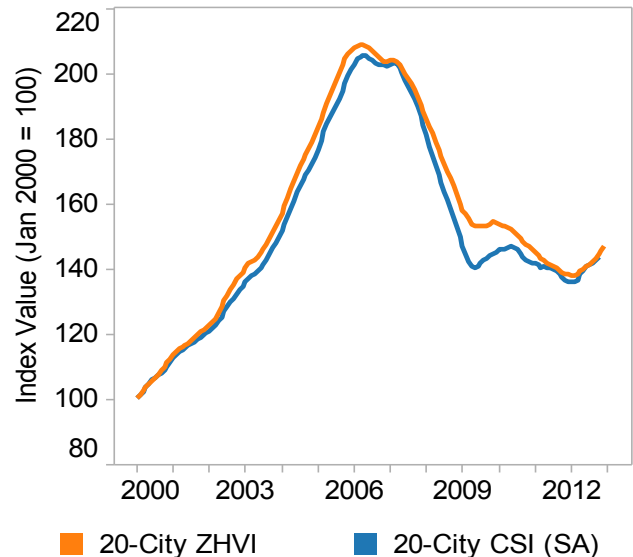
From Zestimate to ZVHI

The ZHVI is defined as the median of all Zestimates in a region or price tier. The beauty of the ZHVI is its simplicity: It is straightforward and intuitive. By leveraging the Zestimate, the ZHVI confers several benefits, including timeliness, accuracy and most importantly, lack of bias. Since the ZHVI is an estimate based on all homes, it doesn't require convoluted models to try to correct for biases inherent in other approaches, such as repeat sales methodology. The ZHVI is published monthly roughly three weeks after the end of the reporting period.

Advantages Over Case-Shiller

Case-Shiller is based on repeat sales methodology, which measures price change by collecting data on homes that have resold in a given region. Case-Shiller only includes homes that have sold at least twice in recent history and excludes all new construction. Because segments of homes may appreciate at different rates and those segments are

Figure 1: 20-City CSI vs. 20-City ZHVI



not proportionally represented in the mix of repeat sales, the index may be biased. The bias is especially acute at smaller geographic regions where limited repeat sales data is available. The table below provides a comprehensive overview of the differences between the Case-Shiller family of indices and the ZHVI.

Exclusion of Foreclosure Re-Sales

Foreclosure resales are substantially different from non-distressed sales, and are often priced at a substantial discount to the non-distressed value of a home. Because of this fact, foreclosure resales are not used to train the AVM's underlying the Zestimate. This means that the ZHVI excludes foreclosures from the price index. By contrast, Case-Shiller includes foreclosure resales in their indices, leading them to represent a blend of two very different market segments. Consumers and investors interested in understanding the change in home values in a regular, non-distressed market will get a less accurate estimate by looking at Case-Shiller.

Figure 1 shows the impact foreclosure resales have on the Case-Shiller indices. The 20-City Composite Case-Shiller Home Price Index (CSI) compares quite well to the 20-city composite created from the ZHVI for most of the historical period. The two indices diverge beginning in 2008 as the number of foreclosure resales begins to increase, and they converge again in 2011 as the discount associated with



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foreclosure resales diminishes (in 2012, the median national discount of a foreclosure resale relative to a non-foreclosure sale was only 7.4%).

Differences in Footprint

When looking at the national level, we find substantial differences between the CSI and ZHVI (see Figure 2) because the data footprint of the CSI is smaller than that of the ZHVI. The more inclusive ZHVI shows a less dramatic boom in home prices in the 2001 to 2006 period (since most of the less populated areas of the country did not experience a housing boom) and a commensurately smaller decline during the bust. As noted, the decline in home prices is further exaggerated in the CSI by the inclusion of foreclosure resales. Interestingly, the peak of home values in the ZHVI was mid-2007 versus 2006 for CSI, again a better representation of the full country versus only the large coastal metros that experienced home price bubbles. Further evidence that the National CSI is biased toward the large coastal metros that make up the 20-City CSI is the strong similarity of these two indices as shown in Figure 3.

In short, while there is fundamental methodological difference between the ZHVI and CSI, most actual differences in the two indices historically are attributable to the differing treatment of foreclosure resales and the difference in the data footprint.

Forecast Case-Shiller Indices from ZHVI

Because the ZHVI is published over a month before the Case-Shiller index, Zillow is able to forecast the value of Case-Shiller before it is released by adjusting for the mix of foreclosures in a region. Since May 2011, the median error for the Zillow forecasts of the Case-Shiller indices has been 0.1% for the 20-City Composite and 0.2% for the 10-City Composite.

Figure 2: National CSI vs. National ZHVI

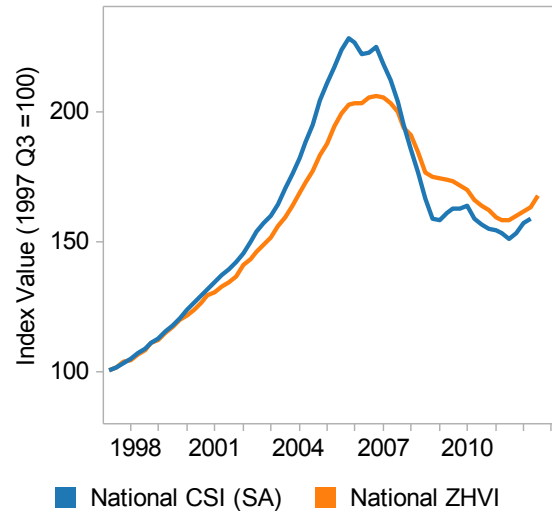
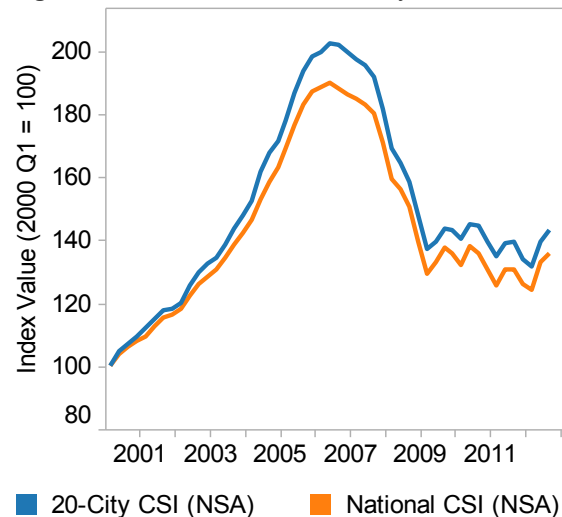


Figure 3: National CSI vs. 20-City CSI



Summary Comparison of National Home Price Indices		
	S&P/Case-Shiller® U.S. National Home Price Index ("S&P/CSI")	Zillow National Home Value Index ("ZHVI")
Primary Purpose	Benchmark for home price-linked financial product development, trading and settlement	Housing market analysis and research
Methodology	Repeat Sales <ul style="list-style-type: none"> Weighted composite of 9 underlying Census Division repeat sales indices Seasonally- & non-seasonally-adjusted versions 	Hedonic Imputation <ul style="list-style-type: none"> Median of actual and estimated market values of all homes within a market (or market segment) 3-month smoothed, using a Henderson Filter Seasonally-adjusted only
Underlying Data	Sale pairs for single-family homes only, i.e., SF homes for which: <ul style="list-style-type: none"> A sale price (distressed or non-distressed) is recorded within the current index reporting period and for which a prior historical sale price is also available Excludes newly-constructed homes Index data history to 1987 	Actual and estimated values of 83 million individual single-family homes, condos, and co-ops: <ul style="list-style-type: none"> Actual, non-distressed sale prices recorded during the index reporting period Estimated non-distressed market values for every home in the Zillow database that does not sell during the reporting period Includes newly constructed homes Index data history to 1997
Coverage	@71% of US housing stock by market value	@95% of US housing stock by market value
Release Frequency	Quarterly	Monthly
Reporting Lag	56 – 61 days	18-23 days