

## Highlights

### **Evaluating the Weighting System Used in Constructing the Census Division and U.S. Indexes**

In the previous HPI release, a short analysis was provided that addressed the extent to which geographic shifts in transactions activity were influencing measurement of price trends in Census Divisions and the U.S. as a whole.<sup>1</sup> The Highlights article explained that FHFA's Census Division house price indexes are constructed by pooling together all house price data from the component states and, as a result of the pooling, price trends for areas with strong sales activity have a relatively large influence on the price change estimates for the Census Division. Because the quarterly change in FHFA's national HPI is formed as a weighted average of changes in the Census Divisions, the effective upweighting of high-volume areas indirectly influences the national price measure.

The article suggested that, if one were to form Census Division measures as weighted averages of the component state-level indexes, the influence of shifts in transaction volumes would be mitigated. Graphs were provided that revealed that the difference between the usual HPI and a state-weighted version had been modest until the last several years, at which point the series estimates diverge. Over the four quarters between 2007Q3 and 2008Q3, for example, FHFA's standard U.S. purchase-only index showed a 6.0 percent decline, while the state-weighted version measured a 6.8 percent decline.

Figure 1 below updates that analysis with data through the fourth quarter. Four-quarter appreciation for the standard purchase-only index is plotted against the appreciation measured for a state-weighted index. The graph shows that the difference between the two measures has shrunk to about 0.2 percentage points. While the standard index estimated a four-quarter price decline of 8.2 percent between the fourth quarters of 2007 and 2008, the state-weighted alternative measured a 8.4 percent decline.

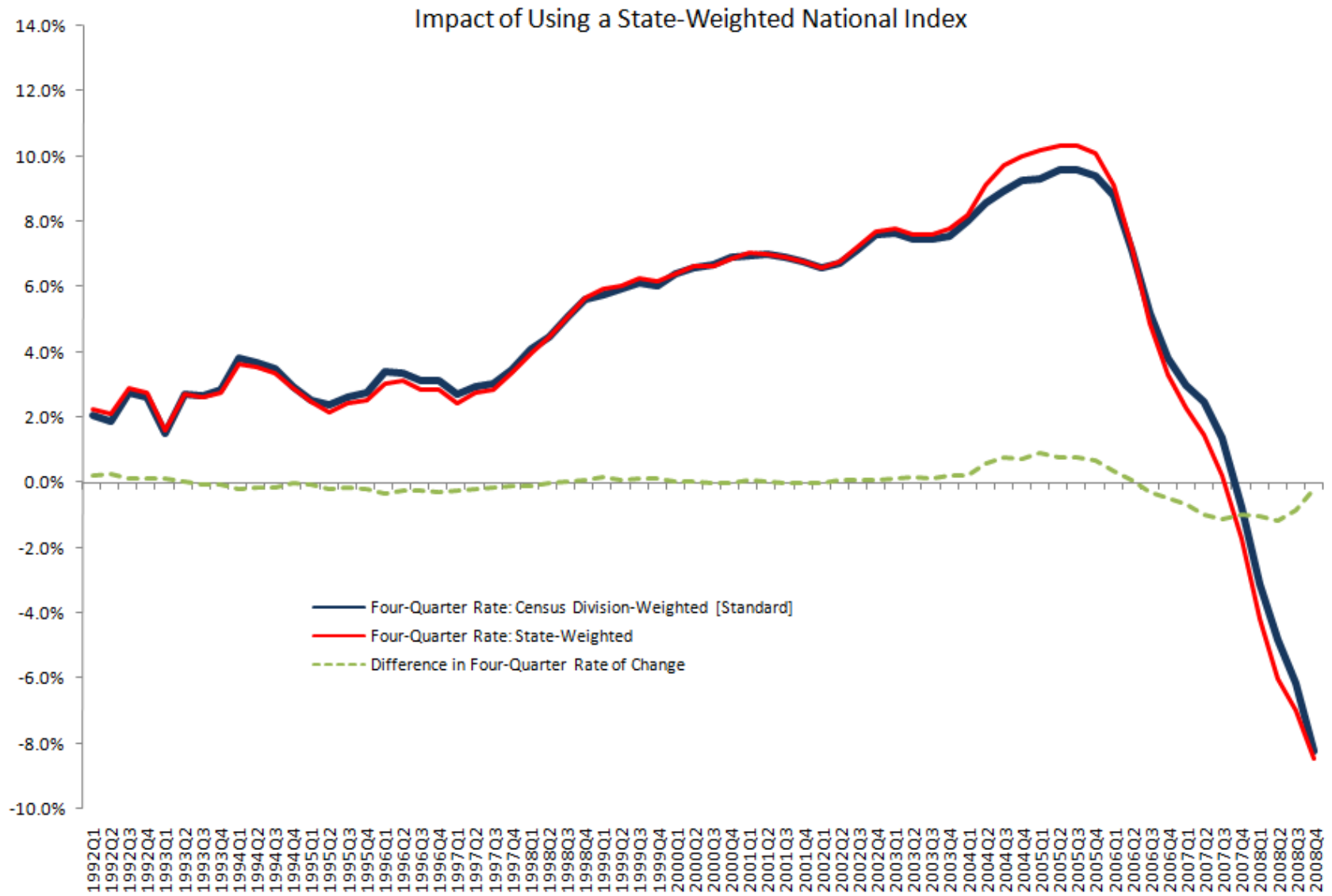
Figure 2 extends the analysis by comparing seasonally-adjusted, quarterly rates appreciation for the standard and state-weighted indexes. The graph reveals that, in the latest quarter, the state-weighted seasonally-adjusted U.S. index fell 2.8 percent, a slightly less dramatic decline than the 3.4 percent fall measured in the standard index.

FHFA continues to study its options concerning re-weighting the Census Division and national indexes and welcomes public input. Comments should be submitted to: [andrew.leventis@fhfa.gov](mailto:andrew.leventis@fhfa.gov).

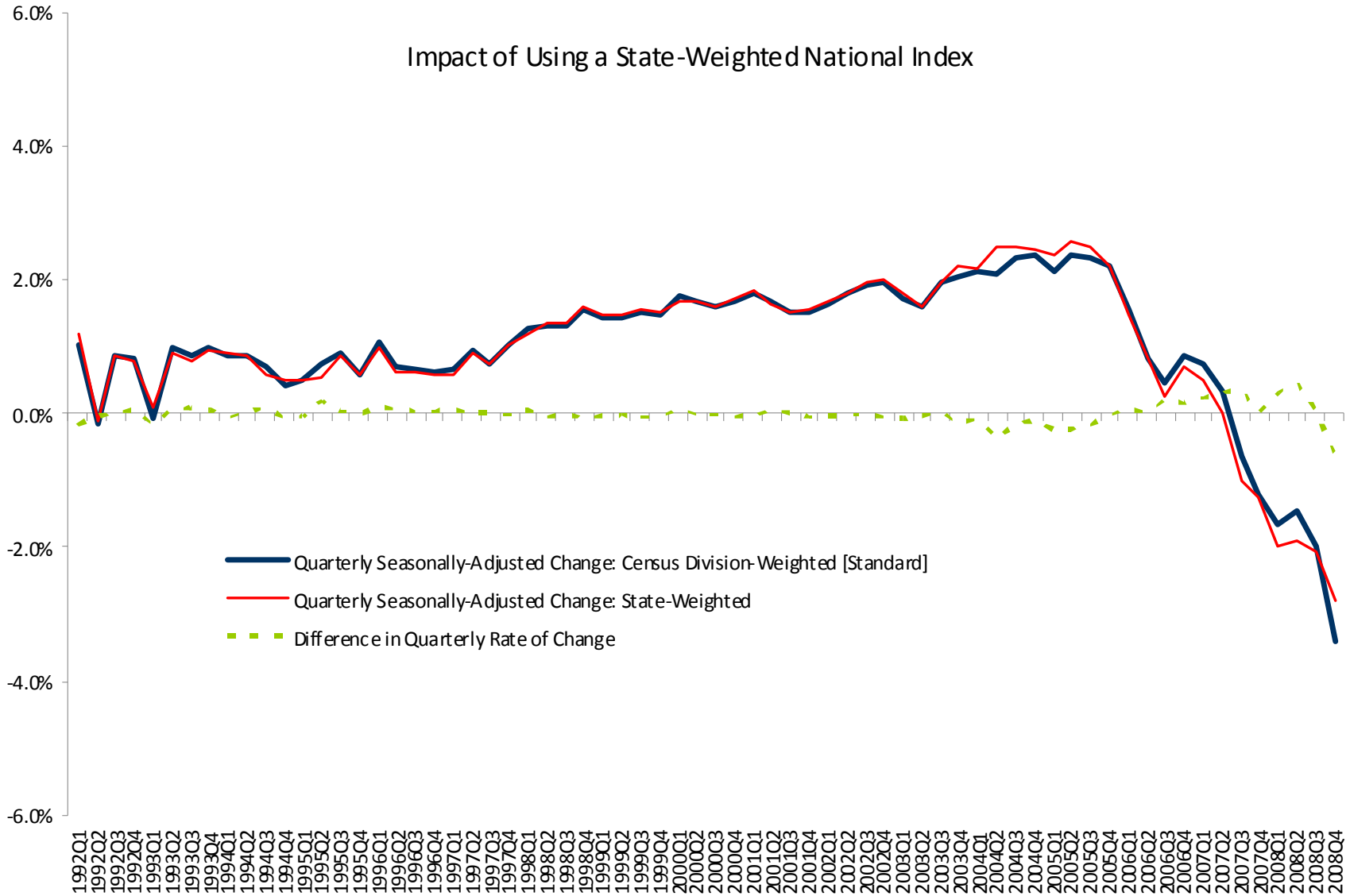
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<sup>1</sup> See pages 11-17 of the 2008Q3 HPI Release (available at [www.ofheo.gov/hpi.aspx?Nav=275](http://www.ofheo.gov/hpi.aspx?Nav=275)).

**Figure 1: Four-Quarter Rates of Appreciation: Purchase-Only Index**



**Figure 2: Quarterly Rates of Appreciation (Seasonally-Adjusted):  
Purchase-Only U.S. Index**



## **Purchase-Only Indexes for Metropolitan Statistical Areas**

FHFA currently releases purchase-only house price indexes for Census Divisions and states, but not for Metropolitan Statistical Areas (MSAs). Omitting appraisal data from refinance mortgages can, for small MSAs, introduce substantial estimation imprecision into index estimates due to the significant reductions in sample sizes. In most periods, significantly more than half of the observations used in estimating FHFA's standard all-transactions indexes are appraisal valuations from refinance mortgages. For areas where data are scarce, the elimination of these data from the estimation data can sharply increase index standard errors.

FHFA continues to examine its options for mitigating the effects of appraisal bias on the all-transactions indexes produced for metropolitan areas.<sup>2</sup> A solution that involves a single, comprehensive approach to estimating all MSA indexes (regardless of the relative data availability) is preferred over a bifurcated solution that would, for example, employ different methodologies for areas with high and low sample sizes.

While FHFA continues to consider such an approach, this HPI release includes a series of purchase-only indexes for the 25 largest MSAs. These data, which can be downloaded at [www.ofheo.gov/hpi\\_download.aspx](http://www.ofheo.gov/hpi_download.aspx), include a time series of four-quarter appreciation rates for each of these areas for periods since 1995. Because house price data tend to be plentiful for these cities, the increase in estimation imprecision caused by dropping refinance appraisals for these areas is relatively modest.

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<sup>2</sup> One solution is discussed in Leventis, Andrew, "Removing Appraisal Bias from a Repeat-Transactions House Price Index: A Basic Approach" available at: [www.ofheo.gov](http://www.ofheo.gov).