

Highlights

Expanding the Number of Purchase-Only Indexes Released to the Public:

New Indexes Now Available for the 75 Largest Metro Areas

Background

OFHEO, one of FHFA's predecessor agencies, began releasing house price indexes for metropolitan areas in June 2000. Initially, those indexes were constructed with both sales prices and appraisal values (i.e., they were "all-transactions" indexes). In May 2009, however, FHFA extended its suite of metropolitan area indexes to include "purchase-only" measures for the 25 largest metropolitan areas. Such measures, which excluded appraisal values from the estimation dataset, were provided both in seasonally adjusted and not-seasonally-adjusted forms. Beginning with this release, FHFA will extend the purchase-only index coverage from the 25 to the 75 largest metropolitan areas.¹

The metro area purchase-only metrics are constructed using the repeat transactions indexing methodology.² There is no methodological difference between the new set of metrics and the previously released purchase-only HPI except that 50 additional metro areas are now being released to the public.³ As with other FHFA indexes, the metro area indexes rely on house value information found within mortgage-level data supplied by Fannie Mae and Freddie Mac.⁴ Since the same property transaction can show up in more than one of the underlying data sources, redundant observations are removed from the sample before the purchase-only metrics are estimated. Both unadjusted and seasonally adjusted purchase-only indexes are provided for each metropolitan area.

The new purchase-only indexes for the largest 75 metropolitan areas can be downloaded on FHFA's website by navigating to the House Price Index webpage, clicking on "[Downloadable Data](#)" and then scrolling down to the heading that begins with "Purchase-Only Indexes".

The downloadable file includes fields for the Core-Based Statistical Area (CBSA) number, metropolitan area name, year, quarter, unadjusted (or non-seasonally adjusted) HPI, and

¹ In general, the "metropolitan areas" are Metropolitan Statistical Areas (MSAs). In some cases, however, the metropolitan areas are metropolitan divisions.

² For a detailed description of the approach, see Calhoun, Charles, "OFHEO House Price Indexes: HPI Technical Description" available at: http://www.fhfa.gov/webfiles/896/hpi_tech.pdf.

³ To choose new metro areas, 2011 population estimates were used to create a list of the largest 75 cities in the United States. HPIs are already produced for 25 select metro areas on that list and the remaining cities represent the new metro areas. The metro areas follow CBSA definitions that existed prior to the February 2013 release of OMB Bulletin 13-01, which set forth new metro-area boundaries for some areas.

⁴ Appraisal values from Enterprise-financed refinance mortgages are not used when forming the purchase-only HPI.

seasonally adjusted HPI.⁵ Below are brief comparisons of appreciation trends and geographic coverage between the 25 currently provided and the additional 50 metropolitan areas.

Appreciation trends between the groups

Non-seasonally adjusted house price appreciation trends are similar between the currently published metropolitan areas and the next 25 metropolitan areas. The last group of metropolitan areas has experienced slightly slower house price appreciation recently. Even so, the overall average change for all 75 metropolitan areas is close to the group trends for the past five years.

- The overall average quarterly change for all 75 metropolitan areas is 1.1 percent. The currently published metro areas have been increasing at a higher average rate of 1.3 percent and the second group of the 25 largest metro areas increased by 1.6 percent this past quarter. In comparison, the last group of the 25 largest metro areas had an average quarterly change of 0.3 percent.
- The overall average annual change is 8.3 percent for all 75 metropolitan areas versus 10.3 percent for the currently published metropolitan areas.
- The overall average five-year change is -9.6 percent for all 75 metropolitan areas versus a -9.5 percent change for the currently published metropolitan areas.

Summary statistics for specific metropolitan area appreciation rates for the seasonally adjusted HPI are provided on page 38 in this quarterly report.

Increased geographic coverage

Highlights Figure 1 illustrates that the new metro areas are well-dispersed across the nation.

- The new metro areas cover an additional 18 states, increasing the total representation to 35 states. All of the census divisions are represented with at least three metro areas.
- The five states with the highest number of metro areas being represented are California (10), Florida (6), New York (5), Texas (5), and Ohio (4). Previously, the list was California (5), Florida (2), New York (2), Pennsylvania (2), and Texas (2).

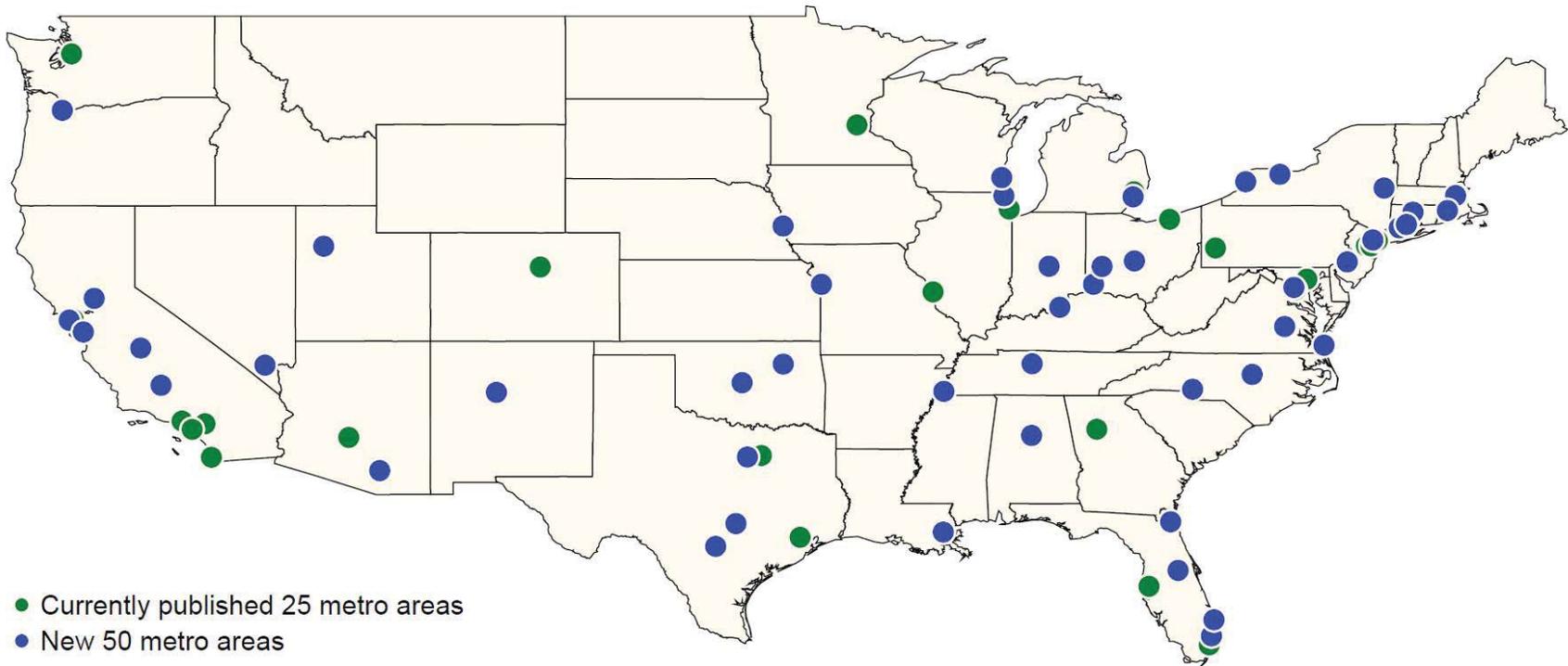
FHFA intends to publish the purchase-only indexes for 75 metropolitan areas going forward. FHFA will document any substantial alterations in future highlight articles or on the HPI website.

FHFA produces the HPI to provide information about how house values are changing over time. FHFA welcomes public input and feedback on how these new indexes--as well as the existing suite of indexes-- are currently being used and how they might be improved. Comments, questions, and suggestions should be addressed to hpihelpdesk@fhfa.gov.

⁵ In those cases where the geographic area is a Metropolitan Division, the “CBSA” number is the Metropolitan Division number.

Highlights Figure 1:

Locations of the 75 Largest Metro Areas used in the Purchase-Only Indexes



* Honolulu, HI is not pictured.

Technical Note

The following sections provide summary statistics assessing the volatility and precision of the newly released indexes. The newly released metrics tend to be produced with smaller sample sizes than are available for other indexes. As a result, the summary statistics indicate the new metrics are slightly less precise and subject to slightly larger revisions than existing metrics. The difference between the new metrics and existing products, however, is not particularly large.

Revisions and Standard Errors: New Metrics vs. Previously-Existing Indexes

Table 1 compares the revision in quarterly price change estimates between states, the currently published 25 metropolitan areas, the next set of 25 large metropolitan areas, and the remaining 25 large metropolitan areas. The average revisions are close to zero, falling between -0.09 percent and 0.06 percent across all the geographies.¹ As one might expect, the mean tendencies are similar and small in magnitude. These comparisons could be muddled, though, if the signs are opposite in the index revisions within a geography. In other words, if groups of states or cities are being revised by the same amount but in opposite directions (one being revised upward while the other goes downward because house prices rise and fall by the same amounts) then the average revisions will cancel out. Thus, average revisions can be close to zero if there are no revisions or when the distribution of revision values is symmetric and centered around zero.

Looking at the average of the *absolute value* of the revisions, larger revisions are associated with the newly released metrics. The average absolute revision for the 25 currently published indexes is 0.5 percent. For the next 25 largest metropolitan areas, the revisions grow to 0.6 percent. For the smallest metropolitan areas among the newly released cities, the average absolute revision is 0.7 percent. Given that population is positively correlated with the size of the housing market—and the number of transactions available in the estimation data—it is not surprising to observe greater revisions with the smaller metro areas.

A comparison of relative standard errors—the standard error divided by the index level—for the latest period indicates that the estimation precision of the new metrics is slightly worse than for the currently published metrics. Because sample sizes tend to be smaller for the newly released metrics, the relative standard errors tend to be larger. The average relative standard error for the currently published metropolitan areas is 1.0 percent. The next 25 largest metropolitan have a value of 1.4 percent and the 51 to 75 largest metro areas are at 1.7 percent.

Breakdown of Purchase-Only Indexes for 75 Largest Metropolitan Areas

Table 2 provides the same statistics computed individually for the 75 largest metropolitan areas. Cities are ordered in descending rank based on their population size. The table's list indicates that seven metro areas have had population increases that now rank them higher than Cleveland-

¹ First, the average first-time revisions are calculated individually for cities and states as the average of the last five revisions (i.e., from 2012Q4 back to 2011Q4). Next, the averages are calculated across different geographies.

Elyria-Mentor (OH), the last place being provided currently in the select metro areas. All together, the 75 largest metro areas represent 4.0 million paired transactions, an increase of 81 percent from the 2.2 million observations being used currently to construct metro area purchase-only HPIs . The average revisions tend to be small and fall between -0.9 percent and 1.1 percent. Two metro areas have an average revision equal to the average absolute revision. The average relative standard errors range from 0.7 percent in Los Angeles-Long Beach-Glendale, CA to 4.6 percent in Honolulu, HI and the mean of all the metro areas is 1.4 percent. The 25 currently provided metro areas tend to have smaller standard errors. Miami-Miami Beach-Kendall, FL is an exception because its average relative standard error exceeds the average of all 75 metro areas.

Average Difference in Measured Appreciation: Purchase-Only vs. All-Transactions Indexes

Another useful comparison is between the appreciations of the purchase-only and all-transactions metro area indexes. Table 3 compares differences over the past year and five years.

The average differences are small for the past four quarters. The average difference is 4.2 percent for states, 6.7 percent for the currently published metropolitan areas, 6.0 percent for the next set of 25 large metropolitan areas, and 4.1 percent for the last 25 large metropolitan areas. As recent average differences have generally been positive, the average absolute differences and the average differences are the same.

Larger average differences appear for states and the currently published metro areas when using a five-year price change. Compared to the four-quarter changes, the recorded magnitudes are slightly less for states and a percentage point higher for the currently published metro areas. The largest five-year state differences are in places where housing markets were hit the hardest, like Arizona, California, Florida, and Nevada. However, the large five-year average differences vanish completely if calculated for the first quarter of 2012 (dropping from 9.1 percent to 0.1 percent for states and from 7.9 percent to -0.8 percent for the currently published metro areas). The culprit is the recent run-up in housing prices. When housing conditions improve quickly, sales tend to lead appraisals and the purchase-only indexes appreciate faster than the all-transactions indexes. To contrast this idea, the four-quarter and five-year average differences are similar for the less populated metro areas in the other two groups because their annual price appreciation has been more modest. In summary, the difference between the four-quarter and five-year price changes is an artifact of the recent price appreciations in larger geographic areas.

Table 1: Revisions and Standard Errors: New Metrics vs. Previously-Existing Purchase-Only Indexes

- (A) Average First-Time Revision in Quarterly Price Change Estimate (Last Five Revisions)
- (B) Average Absolute First-Time Revision in Quarterly Price Change Estimate (Last Five Revisions)
- (C) Average of Relative Standard Error (Stderr/Index Value) (for 2013Q1 Index Value)

Geography	(A)	(B)	(C)
States (including the District of Columbia)	-0.09%	0.38%	1.12%
25 Currently Published Metropolitan Areas	0.06%	0.47%	1.00%
Next 25 Largest Metropolitan Areas	0.00%	0.55%	1.36%
51-75th Largest Metropolitan Areas	-0.01%	0.69%	1.67%

Table 2: Purchase-Only Indexes (NSA) for 75 Largest Metropolitan Areas
Revisions, Absolute Revisions, and Relative Standard Errors

Currently-Published Indexes Shaded in Green

(A) Average First-Time Revision in Quarterly Price Change Estimate (Last Five Revisions)

(B) Average Absolute First-Time Revision in Quarterly Price Change Estimate (Last Five Revisions)

(C) Average of Relative Standard Error (Stderr/Index Value) (for 2013Q1 Index Value)

Rank	CBSA	Metropolitan Area Name	(A)	(B)	(C)
1	35644	New York-White Plains-Wayne, NY-NJ (MSAD)	-0.02%	0.68%	1.06%
2	31084	Los Angeles-Long Beach-Glendale, CA (MSAD)	-0.16%	0.34%	0.65%
3	16974	Chicago-Joliet-Naperville, IL (MSAD)	0.19%	0.21%	0.66%
4	26420	Houston-Sugar Land-Baytown, TX	-0.11%	0.68%	1.21%
5	12060	Atlanta-Sandy Springs-Marietta, GA	0.24%	1.02%	0.89%
6	47894	Washington-Arlington-Alexandria, DC-VA-MD-WV (MSAD)	0.02%	0.57%	1.11%
7	19124	Dallas-Plano-Irving, TX (MSAD)	0.32%	0.45%	0.76%
8	40140	Riverside-San Bernardino-Ontario, CA	-0.13%	0.36%	0.92%
9	38060	Phoenix-Mesa-Glendale, AZ	0.20%	0.61%	0.86%
10	37964	Philadelphia, PA (MSAD)	0.26%	0.44%	0.91%
11	33460	Minneapolis-St. Paul-Bloomington, MN-WI	0.16%	0.35%	0.66%
12	41740	San Diego-Carlsbad-San Marcos, CA	-0.22%	0.36%	1.02%
13	42044	Santa Ana-Anaheim-Irvine, CA (MSAD)	0.26%	0.52%	0.81%
14	35004	Nassau-Suffolk, NY (MSAD)	-0.08%	0.34%	1.11%
15	45300	Tampa-St. Petersburg-Clearwater, FL	0.52%	0.69%	1.33%
16	41180	St. Louis, MO-IL	-0.56%	0.56%	1.04%
17	12580	Baltimore-Towson, MD	-0.04%	0.67%	1.39%
18	42644	Seattle-Bellevue-Everett, WA (MSAD)	0.10%	0.21%	0.77%
19	19740	Denver-Aurora-Broomfield, CO	0.08%	0.49%	0.86%
20	36084	Oakland-Fremont-Hayward, CA (MSAD)	-0.21%	0.24%	1.01%
21	33124	Miami-Miami Beach-Kendall, FL (MSAD)	0.00%	0.65%	1.76%
22	47644	Warren-Troy-Farmington Hills, MI (MSAD)	-0.01%	0.42%	0.73%
23	38300	Pittsburgh, PA	0.00%	0.06%	1.28%
24	20764	Edison-New Brunswick, NJ (MSAD)	0.21%	0.42%	1.07%
25	38900	Portland-Vancouver-Hillsboro, OR-WA	-0.24%	0.31%	0.78%
26	41700	San Antonio-New Braunfels, TX	0.28%	0.43%	1.90%
27	23104	Fort Worth-Arlington, TX (MSAD)	-0.05%	0.39%	1.09%
28	40900	Sacramento-Arden-Arcade-Roseville, CA	0.18%	0.33%	0.90%
29	36740	Orlando-Kissimmee-Sanford, FL	-0.51%	0.95%	1.86%
30	35084	Newark-Union, NJ-PA (MSAD)	-0.22%	0.26%	1.31%
31	17140	Cincinnati-Middletown, OH-KY-IN	0.06%	0.36%	0.92%
32	17460	Cleveland-Elyria-Mentor, OH	0.39%	0.41%	1.13%
33	28140	Kansas City, MO-KS	-0.02%	0.48%	1.21%
34	29820	Las Vegas-Paradise, NV	-0.51%	0.72%	1.26%
35	14484	Boston-Quincy, MA (MSAD)	0.00%	0.31%	1.18%
36	41940	San Jose-Sunnyvale-Santa Clara, CA	-0.04%	0.58%	1.10%
37	18140	Columbus, OH	-0.15%	0.19%	0.90%
38	19804	Detroit-Livonia-Dearborn, MI (MSAD)	0.17%	1.02%	1.39%
39	16740	Charlotte-Gastonia-Rock Hill, NC-SC	0.38%	0.54%	1.38%
40	41884	San Francisco-San Mateo-Redwood City, CA (MSAD)	0.08%	0.56%	1.76%
41	12420	Austin-Round Rock-San Marcos, TX	0.50%	0.50%	1.25%
42	22744	Ft. Lauderdale-Pompano Bch.-Deerfield Bch., FL(MSAD)	0.06%	0.56%	1.69%

Table 2: Purchase-Only Indexes (NSA) for 75 Largest Metropolitan Areas
Revisions, Absolute Revisions, and Relative Standard Errors

Currently-Published Indexes Shaded in Green

(A) Average First-Time Revision in Quarterly Price Change Estimate (Last Five Revisions)

(B) Average Absolute First-Time Revision in Quarterly Price Change Estimate (Last Five Revisions)

(C) Average of Relative Standard Error (Stderr/Index Value) (for 2013Q1 Index Value)

Rank	CBSA	Metropolitan Area Name	(A)	(B)	(C)
43	26900	Indianapolis-Carmel, IN	-0.40%	0.74%	1.29%
44	47260	Virginia Beach-Norfolk-Newport News, VA-NC	-0.04%	0.71%	1.55%
45	34980	Nashville-Davidson--Murfreesboro--Franklin, TN	-0.19%	0.64%	1.26%
46	39300	Providence-New Bedford-Fall River, RI-MA	-0.02%	0.27%	1.32%
47	33340	Milwaukee-Waukesha-West Allis, WI	-0.09%	0.25%	0.91%
48	15764	Cambridge-Newton-Framingham, MA (MSAD)	0.09%	0.41%	1.17%
49	27260	Jacksonville, FL	-0.38%	1.01%	2.44%
50	48424	West Palm Beach-Boca Raton-Boynton Beach, FL (MSAD)	1.12%	1.12%	2.28%
51	32820	Memphis, TN-MS-AR	-0.11%	0.71%	1.46%
52	31140	Louisville-Jefferson County, KY-IN	-0.34%	0.43%	1.01%
53	36420	Oklahoma City, OK	-0.20%	0.53%	1.44%
54	40060	Richmond, VA	-0.19%	0.68%	1.29%
55	15804	Camden, NJ (MSAD)	-0.16%	0.94%	1.61%
56	13644	Bethesda-Rockville-Frederick, MD (MSAD)	0.56%	1.33%	1.51%
57	25540	Hartford-West Hartford-East Hartford, CT	-0.22%	0.53%	1.40%
58	35380	New Orleans-Metairie-Kenner, LA	-0.22%	0.60%	1.49%
59	39580	Raleigh-Cary, NC	0.44%	0.55%	1.36%
60	41620	Salt Lake City, UT	0.35%	0.62%	1.00%
61	15380	Buffalo-Niagara Falls, NY	-0.10%	0.67%	1.65%
62	13820	Birmingham-Hoover, AL	0.96%	1.40%	1.57%
63	40380	Rochester, NY	0.22%	0.29%	1.21%
64	46060	Tucson, AZ	-0.81%	1.18%	1.94%
65	26180	Honolulu, HI	0.57%	1.08%	4.61%
66	46140	Tulsa, OK	0.02%	0.62%	1.73%
67	23420	Fresno, CA	-0.08%	0.31%	1.72%
68	14860	Bridgeport-Stamford-Norwalk, CT	0.26%	0.80%	1.90%
69	10740	Albuquerque, NM	0.10%	0.41%	1.24%
70	36540	Omaha-Council Bluffs, NE-IA	-0.11%	0.61%	1.36%
71	29404	Lake County-Kenosha County, IL-WI (MSAD)	0.11%	0.53%	1.39%
72	10580	Albany-Schenectady-Troy, NY	-0.03%	0.34%	2.00%
73	35300	New Haven-Milford, CT	-0.47%	0.49%	2.23%
74	12540	Bakersfield-Delano, CA	0.10%	0.62%	2.21%
75	19380	Dayton, OH	-0.84%	1.12%	1.51%

Table 3: Average Difference in Measured Appreciation:
Purchase-Only Minus All-Transactions Indexes (Not Seasonally Adjusted)

Geography	Four-Quarter Price Change		Five-Year Price Change	
	Average Difference	Average Absolute Difference	Average Difference	Average Absolute Difference
States (including the District of Columbia)	4.16%	4.26%	3.47%	3.80%
25 Currently Published Metropolitan Areas	6.70%	6.75%	7.86%	7.90%
Next 25 Largest Metropolitan Areas	5.98%	6.19%	6.04%	6.10%
51-75th Largest Metropolitan Areas	4.14%	4.72%	3.59%	3.97%