

Technical Note

Comparing House Price Indexes based on OMB 2009 and 2013 Metropolitan Area Definitions

FHFA follows the guidance of the Office of Management and Budget (OMB) which defines metropolitan areas based on census data by grouping together socially and economically integrated counties. The definitions impact which geographic areas are grouped together when we compute quarterly house price indexes (HPIs). Last quarter, a transition happened when the former 2009 delineations were replaced by a new set of 2013 delineations per the decennial census.¹ Metropolitan areas will continue to use the 2013 delineations in future releases.

This Technical Note documents that metropolitan area HPIs do not differ dramatically when using the 2009 versus the 2013 delineations. HPIs based on the earlier delineations are available on our website on the Downloadable Data page at <http://www.fhfa.gov/Default.aspx?Page=87>. The file can be found under the “Additional Data” section then the “Utility Files and Background Information for Index Construction” subsection.

The number of metropolitan areas and general differences in changes

Table 1 documents the number of metropolitan areas in the two delineations and how price changes compared between the definitions. There were 384 metropolitan areas under the 2009 delineations whereas there are now 401 metropolitan areas per the 2013 delineations.² Many places are represented under both sets of definitions. In total, there are 364 such repeat areas (86 percent) among the 421 unique metropolitan areas. Most of the repeat areas had no or only minor changes in the underlying counties, but some experienced rather large boundary shifts.

One way to measure the effect of the changes is to compare the differences in the HPI values as calculated under the 2009 versus the 2013 definitions. The bottom of Table 1 shows there are rather minimal differences in HPI changes when computed over one-quarter, four-quarter, and five-year periods. A green shade denotes a positive difference while a red shade denotes a negative difference. For example, the one-quarter HPI change compared between the 2013 and 2009 delineations would be green if the average one-quarter change is greater under the 2013 delineations.³ The means are closely centered around zero, showing that positive and negative differences cancel each other out in the average. The minimum and maximum values for the differences in the changes are relatively small.⁴

Comparing differences in HPI changes for specific metropolitan areas

Table 2 presents the differences in HPI changes for the 84 repeat metropolitan areas that experienced a change. Again, color shading allows for quick visual comparison. The

¹ The transition is described in the 2013Q2 Technical Note at <http://www.fhfa.gov/webfiles/25481/Focus2Q13.pdf>.

² Total counts are based on CBSA numbers (not names) for metropolitan statistical areas and divisions.

³ The averages are for repeat metropolitan areas (i.e., where differences can be computed) under the 2009 and 2013 definitions. Not all metropolitan areas had changes. Averages for places with changes are listed in Table 2.

⁴ An exception is the minimum of the differences in the five-year changes for the all-transactions index, which has a value of -6.36% and corresponds to Salisbury, MD-DE. When that area is excluded, the minimum is -2.20%.

differences in the purchase-only HPI changes are more often negative for one-quarter, four-quarter, and five-year changes while the differences in the all-transactions HPI changes are more balanced except for more positive differences in five-year changes. This means the one-quarter, four-quarter, and five-year changes in the purchase-only HPI tend to be lower using the 2013 delineations (versus the 2009 delineations). Some places have consistently all positive or negative differences for one-quarter, four-quarter, and five-year changes. This happens in 34 percent of the listed purchase-only HPIs (most instances are all negative) and in 50 percent of the all-transactions HPIs.

Patterns are not apparent by population size or geographic location. Overall, the differences in the HPI changes seem to be relatively small in magnitude and lack any systematic pattern between types of indexes, change periods, population size, and location. FHFA will continue to make both sets of indexes available for at least the next year.

Table 1: Counting up metro areas and comparing differences in HPI changes

Counting up metro areas	N	%
Metro areas in 2009 OMB definitions:	384	
Metro areas in 2013 OMB definitions:	401	
Metro areas in 2009, 2013, or both:	421	100.00%
Metro areas in only 2009:	20	4.75%
Metro areas in only 2013:	37	8.79%
Repeat metro areas in 2009 and 2013:	364	86.46%
Repeat metro areas with HPI changes:	84	23.08%
Repeat metro areas with exactly the same HPI:	280	76.92%

Differences in HPI changes for all metro areas (2013Q3)	Min	Mean	Max
Differences in one-quarter changes for Purchase-Only (PO)	-1.18%	0.01%	2.78%
Differences in four-quarter changes for PO	-1.55%	-0.05%	0.76%
Differences in five-year changes for PO	-2.58%	-0.06%	1.98%
Differences in one-quarter changes for All-Transactions (AT)	-1.56%	0.00%	2.43%
Differences in four-quarter changes for AT	-1.93%	-0.02%	1.00%
Differences in five-year changes for AT	-6.36%	-0.02%	1.63%

Notes: FHFA calculations are based on metropolitan area HPIs. Summary statistics reflect only published data that have sample sizes of N=100 for the Purchase-Only HPIs and N=401 for the All-Transactions HPIs.

Table 2: Differences in 2013Q3 HPI changes (not seasonally adjusted) computed under 2009 and 2013 delineations

CBSA	Metropolitan area name	Purchase-Only HPIs			All-Transactions HPIs		
		1QΔ	4QΔ	5yrΔ	1QΔ	4QΔ	5yrΔ
	Average metropolitan area changes	0.02%	-0.14%	-0.18%	0.00%	-0.08%	-0.08%
11100	Amarillo, TX				0.00%	0.00%	0.01%
12060	Atlanta-Sandy Springs-Roswell, GA	-0.01%	0.09%	-0.09%	0.03%	0.00%	0.03%
12260	Augusta-Richmond County, GA-SC				0.08%	0.17%	0.07%
13140	Beaumont-Port Arthur, TX				0.09%	0.00%	0.00%
13740	Billings, MT				0.00%	0.00%	0.06%
13900	Bismarck, ND				-0.08%	-0.14%	0.08%
13980	Blacksburg-Christiansburg-Radford, VA				0.11%	-0.18%	0.42%
14020	Bloomington, IN				-0.47%	-0.26%	-0.47%
14540	Bowling Green, KY				0.66%	0.77%	1.09%
15764	Cambridge-Newton-Framingham, MA (MSAD)	-0.10%	-0.23%	-1.92%	0.30%	0.45%	1.63%
16620	Charleston, WV				-0.01%	-0.31%	0.16%
16740	Charlotte-Concord-Gastonia, NC-SC	-0.03%	-1.17%	-1.21%	0.12%	0.51%	0.49%
16820	Charlottesville, VA				-0.32%	0.13%	-0.05%
16974	Chicago-Naperville-Arlington Heights, IL (MSAD)	-0.27%	0.06%	0.45%	-0.12%	-0.20%	-0.36%
17140	Cincinnati, OH-KY-IN	-0.06%	-0.05%	-0.02%	0.01%	-0.01%	-0.02%
17300	Clarksville, TN-KY				-0.51%	-0.17%	-0.04%
17860	Columbia, MO				0.05%	0.11%	0.02%
18140	Columbus, OH	0.05%	0.11%	0.04%	0.20%	0.14%	0.12%
18880	Crestview-Fort Walton Beach-Destin, FL				-0.86%	-1.93%	0.22%
19124	Dallas-Plano-Irving, TX (MSAD)	-0.02%	0.00%	0.00%	0.00%	0.00%	-0.01%
19380	Dayton, OH	-0.60%	-0.46%	-0.30%	-0.01%	-0.03%	-0.02%
19660	Deltona-Daytona Beach-Ormond Beach, FL				0.52%	-0.52%	-2.20%
21060	Elizabethtown-Fort Knox, KY				-0.12%	-0.49%	0.15%
21780	Evansville, IN-KY				0.16%	0.10%	0.36%
22900	Fort Smith, AR-OK				0.14%	0.49%	0.51%
23104	Fort Worth-Arlington, TX (MSAD)	0.14%	-0.18%	-0.38%	0.02%	0.10%	0.09%
24340	Grand Rapids-Wyoming, MI	-1.14%	0.76%	-0.39%	-0.26%	-0.39%	-0.51%
24780	Greenville, NC				0.01%	0.08%	-0.04%
24860	Greenville-Anderson-Mauldin, SC	0.48%	-1.55%	-2.58%	-0.37%	0.20%	1.12%
25060	Gulfport-Biloxi-Pascagoula, MS				0.93%	-0.21%	0.67%
25180	Hagerstown-Martinsburg, MD-WV				-0.21%	-0.05%	-0.03%
26420	Houston-The Woodlands-Sugar Land, TX	0.00%	0.01%	0.02%	0.00%	-0.03%	-0.04%
26580	Huntington-Ashland, WV-KY-OH				0.50%	-0.22%	0.42%
26820	Idaho Falls, ID				-0.35%	-0.30%	-0.41%
26900	Indianapolis-Carmel-Anderson, IN	0.08%	0.25%	-0.13%	0.23%	0.23%	0.30%
27140	Jackson, MS				-0.26%	-0.17%	-0.24%
27180	Jackson, TN				-0.07%	0.18%	-0.01%
28140	Kansas City, MO-KS	0.18%	-0.01%	-0.06%	0.02%	0.04%	0.06%
28940	Knoxville, TN	0.05%	-0.03%	-1.05%	0.09%	0.28%	0.27%
29020	Kokomo, IN				-0.03%	-0.64%	1.02%
29180	Lafayette, LA				0.09%	0.01%	-1.44%
30020	Lawton, OK				-0.29%	-0.38%	0.28%
31140	Louisville/Jefferson County, KY-IN	-0.18%	-0.03%	-0.17%	-0.04%	0.10%	0.19%
31180	Lubbock, TX				0.01%	0.02%	0.00%
31540	Madison, WI				0.09%	0.12%	0.16%
31740	Manhattan, KS				-0.50%	-0.73%	-1.18%
32820	Memphis, TN-MS-AR	0.00%	0.00%	0.00%	-0.03%	-0.02%	-0.02%
33260	Midland, TX				0.03%	0.00%	0.01%
33460	Minneapolis-St. Paul-Bloomington, MN-WI	-0.03%	-0.10%	0.13%	0.08%	0.09%	0.03%
34100	Morristown, TN				0.25%	0.30%	0.24%
34820	Myrtle Beach-Conway-North Myrtle Beach, SC-NC				0.73%	-0.24%	0.08%
34980	Nashville-Davidson--Murfreesboro--Franklin, TN	-0.23%	0.23%	-0.46%	0.08%	0.07%	0.30%
35084	Newark, NJ-PA (MSAD)	0.04%	0.12%	-0.26%	-0.11%	-0.14%	-0.38%

Table 2: Differences in 2013Q3 HPI changes (not seasonally adjusted) computed under 2009 and 2013 delineations

CBSA	Metropolitan area name	Purchase-Only HPIs			All-Transactions HPIs		
		1QΔ	4QΔ	5yrΔ	1QΔ	4QΔ	5yrΔ
35380	New Orleans-Metairie, LA	-0.01%	-0.05%	-0.11%	-0.03%	0.00%	-0.04%
36260	Ogden-Clearfield, UT				0.31%	0.58%	0.41%
37460	Panama City, FL				0.67%	-0.25%	-0.12%
37620	Parkersburg-Vienna, WV				2.43%	-1.65%	-0.03%
37964	Philadelphia, PA (MSAD)	-1.18%	0.20%	1.32%	0.49%	0.15%	0.01%
38540	Pocatello, ID				-0.27%	-0.30%	-0.02%
39660	Rapid City, SD				0.04%	0.37%	0.46%
40060	Richmond, VA	-0.34%	-0.45%	-0.14%	-0.02%	0.02%	-0.09%
40340	Rochester, MN				0.06%	0.18%	0.18%
40380	Rochester, NY	-0.18%	-0.39%	-0.28%	-0.05%	-0.01%	0.03%
41180	St. Louis, MO-IL	0.00%	0.01%	0.02%	0.01%	0.01%	0.01%
41540	Salisbury, MD-DE				-1.56%	1.00%	-6.36%
41620	Salt Lake City, UT	-0.10%	-0.12%	0.13%	0.12%	0.13%	0.01%
41884	San Francisco-Redwood City-South San Francisco, CA (MSAD)	0.22%	-0.71%	1.98%	-0.25%	-0.93%	-1.81%
43340	Shreveport-Bossier City, LA				-0.07%	-0.20%	-0.24%
43580	Sioux City, IA-NE-SD				-0.26%	-0.39%	-1.98%
43900	Spartanburg, SC				0.36%	0.08%	0.27%
44060	Spokane-Spokane Valley, WA				0.07%	-0.17%	-0.12%
44140	Springfield, MA				-0.11%	0.00%	-0.13%
45500	Texarkana, TX-AR				-0.12%	-0.20%	0.03%
45780	Toledo, OH				-0.40%	-0.38%	-0.01%
46220	Tuscaloosa, AL				-0.12%	-0.11%	-0.07%
47020	Victoria, TX				0.06%	-0.67%	-1.07%
47260	Virginia Beach-Norfolk-Newport News, VA-NC	-0.01%	-0.01%	-0.02%	-0.02%	0.05%	-0.02%
47380	Waco, TX				-0.15%	0.01%	0.02%
47580	Warner Robins, GA				0.33%	-0.29%	0.75%
47894	Washington-Arlington-Alexandria, DC-VA-MD-WV (MSAD)	-0.07%	-0.07%	-0.61%	-0.01%	-0.02%	0.21%
48620	Wichita, KS	0.00%	0.00%	-0.04%	0.01%	0.05%	0.06%
48900	Wilmington, NC				-1.16%	-0.60%	-1.41%
49180	Winston-Salem, NC	2.78%	-0.90%	0.78%	-0.49%	0.04%	0.51%
49340	Worcester, MA-CT	1.15%	0.19%	-0.26%	-0.11%	0.15%	0.58%

Notes: FHFA has produced metropolitan area HPIs for all published areas using the OMB 2009 delineations. This table only shows places where HPI changes differ when using 2009 and 2013 delineations ($N=84$). There are a large number of repeat metro areas where HPI changes are exactly the same between the delineations ($N=280$).