

## Highlights

With the HPI release for the [second quarter of 2011](#), FHFA published an “expanded-data” HPI. That index, which will be released in future quarters, supplements FHFA’s standard dataset—home values for mortgages financed by Fannie Mae and Freddie Mac (the “Enterprises”)—with data from two new sources. These new sources include: (1) FHA-endorsed loans and (2) county recorder information supplied by DataQuick Information Systems. As discussed in the Highlights article accompanying [last quarter’s HPI release](#), to the extent that differences exist, the expanded-data HPI will better reflect price trends for houses without Enterprise financing.

Table 1 reports the changes in the expanded-data HPI through the latest quarter. Seasonally adjusted quarterly and four-quarter price changes are shown for the new indexes and are compared against changes for the standard purchase-only HPI.

For the U.S. as a whole, the expanded-data index and the traditional purchase-only index report the same price change between the second and third quarters of 2011: 0.2 percent. Over the last four quarters, the two measures diverge somewhat, as the expanded-data measure evidences a slightly less severe decline of 2.9 percent as compared with a 3.7 percent decline for the purchase-only index.

For individual states, Table 1 suggests that changes for the two indexes, while highly correlated, can differ significantly. The size of the differences tends to be less dramatic for the four-quarter changes, presumably indicative that some of the difference between the two indexes can be attributed to statistical noise from sampling variation.

## Highlights Part I, Table 1

Comparison of Quarterly and Four-Quarter Price Changes Reported in Traditional Purchase-Only and Expanded-Data House Price Indexes

2011Q3 HPI Release

	Change over Latest Quarter (Seasonally Adjusted)		Change over Latest Four Quarters (Seasonally Adjusted)	
	Traditional (Purchase-Only) HPI	Expanded-Data HPI*	Traditional (Purchase-Only) HPI	Expanded-Data HPI*
<b>United States</b>	<b>0.2%</b>	<b>0.2%</b>	<b>-3.7%</b>	<b>-2.9%</b>
Pacific Census Division	-0.5%	-1.0%	-6.8%	-4.6%
Mountain Census Division	-0.2%	-0.5%	-6.8%	-5.7%
West North Central Division	1.5%	1.5%	-2.5%	-1.2%
West South Central Division	-0.4%	0.3%	-1.7%	-1.6%
East North Central Division	0.7%	0.6%	-3.0%	-3.3%
East South Central Division	0.5%	0.5%	-2.8%	-1.9%
New England Division	0.0%	0.4%	-2.5%	-0.7%
Middle Atlantic Division	0.0%	0.5%	-2.2%	-1.2%
South Atlantic Division	0.5%	-0.1%	-4.2%	-3.8%
Alabama	0.6%	1.8%	-5.0%	-3.4%
Alaska	-0.2%	-0.2%	-0.8%	-1.1%
Arizona	-1.5%	-1.2%	-12.0%	-7.2%
Arkansas	1.9%	1.4%	-0.9%	-2.2%
California	-0.7%	-1.4%	-7.0%	-3.9%
Colorado	0.6%	0.3%	-0.2%	-1.6%
Connecticut	-0.4%	0.0%	-1.8%	-0.8%
Delaware	0.3%	-0.3%	-6.4%	-5.8%
District of Columbia	-3.7%	0.0%	-1.3%	2.8%

\* - Estimated using mortgage data from Fannie Mae and Freddie Mac, county records information licensed from DataQuick Information Systems, and loan-level data from the Federal Housing Administration.

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Comparison of Quarterly and Four-Quarter Price Changes Reported in Traditional Purchase-Only and Expanded-Data House Price Indexes

2011Q3 HPI Release

	<b>Change over Latest Quarter (Seasonally Adjusted)</b>		<b>Change over Latest Four Quarters (Seasonally Adjusted)</b>	
	Traditional (Purchase-Only) HPI	Expanded-Data HPI*	Traditional (Purchase-Only) HPI	Expanded-Data HPI*
Florida	2.5%	0.0%	-3.5%	-2.0%
Georgia	-1.6%	-1.5%	-8.4%	-9.2%
Hawaii	-0.6%	1.6%	-2.0%	-1.9%
Idaho	0.9%	1.8%	-8.6%	-8.1%
Illinois	0.7%	-0.1%	-4.6%	-4.8%
Indiana	0.3%	1.3%	-0.8%	0.2%
Iowa	1.2%	0.6%	1.3%	0.5%
Kansas	0.7%	0.8%	-2.2%	-2.4%
Kentucky	-0.7%	0.1%	-2.7%	-2.6%
Louisiana	-0.1%	0.1%	-2.1%	-2.6%
Maine	1.9%	2.9%	-1.6%	-1.4%
Maryland	-1.6%	0.6%	-4.2%	-2.7%
Massachusetts	-0.4%	0.1%	-2.2%	0.3%
Michigan	2.4%	1.2%	-2.0%	-3.9%
Minnesota	1.0%	0.9%	-5.3%	-3.8%
Mississippi	-0.8%	0.5%	-2.7%	-1.8%
Missouri	2.2%	2.8%	-4.3%	-0.9%
Montana	-0.7%	0.6%	-2.7%	-1.4%
Nebraska	2.4%	1.3%	0.5%	1.5%
Nevada	-0.6%	-3.1%	-12.3%	-10.3%
New Hampshire	0.3%	0.1%	-4.4%	-3.8%

\* - Estimated using mortgage data from Fannie Mae and Freddie Mac, county records information licensed from DataQuick Information Systems, and loan-level data from the Federal Housing Administration.

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Comparison of Quarterly and Four-Quarter Price Changes Reported in Traditional Purchase-Only and Expanded-Data House Price Indexes

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	Traditional (Purchase-Only) HPI	Expanded-Data HPI*	Traditional (Purchase-Only) HPI	Expanded-Data HPI*
New Jersey	-0.4%	-0.3%	-4.8%	-3.9%
New Mexico	0.2%	0.1%	-5.5%	-6.6%
New York	0.0%	1.2%	-1.7%	1.3%
North Carolina	0.1%	0.1%	-3.6%	-3.2%
North Dakota	1.6%	1.5%	5.4%	5.1%
Ohio	-0.3%	0.2%	-3.4%	-3.2%
Oklahoma	-2.6%	-1.2%	-2.4%	-1.9%
Oregon	1.4%	1.4%	-4.9%	-4.3%
Pennsylvania	0.2%	0.3%	-1.1%	-2.1%
Rhode Island	-0.5%	-1.4%	-6.2%	-3.6%
South Carolina	-0.5%	-0.7%	-4.6%	-4.9%
South Dakota	0.9%	2.0%	-0.1%	1.1%
Tennessee	1.9%	-0.1%	-1.1%	-0.4%
Texas	-0.4%	0.5%	-1.6%	-1.3%
Utah	0.6%	-0.1%	-5.0%	-5.5%
Vermont	-0.4%	1.2%	-1.2%	3.3%
Virginia	0.8%	0.1%	-1.4%	-3.5%
Washington	-0.4%	-1.1%	-8.7%	-8.2%
West Virginia	2.6%	4.1%	-3.2%	3.6%
Wisconsin	0.0%	0.5%	-3.7%	-3.4%
Wyoming	1.0%	0.1%	2.9%	-2.0%

\* - Estimated using mortgage data from Fannie Mae and Freddie Mac, county records information licensed from DataQuick Information Systems, and loan-level data from the Federal Housing Administration.

## Highlights—Part II

The U.S. housing bust of the last five years has coincided with a dramatic boom in commodities prices. Most notably, the prices of oil and petroleum products have risen sharply over that timeframe. Prices for other basic commodities, including coal, precious metals, copper, and agricultural products have also risen significantly.

While the boom in commodity prices has had a negative impact on many U.S. communities, citizens in a number of U.S. states have benefited from the price increases. For areas that are net producers of such goods, the commodity price increases have worked to offset the effects of the housing bust. Indeed, in some commodity-rich states, increases in employment and incomes have pushed up prices, despite countervailing factors.

In this Highlights article, a brief analysis of home price trends is provided for states with significant employment in mining and oil extraction. As opposed to agriculture—where the effects of a price boom may be dissipated over a large geographic area—growth in the oil and mining industry may have a more concentrated impact because workers will generally demand housing near specific locations. Prices for homes near mines and wellheads, for example, may be bid up when employment and wage levels increase.

Also notable about the oil industry is the fact that the price increases only account for part of the recent boom. The development and use of new extraction technologies have quickly expanded production in many areas, meaning that industry growth has been propelled by both price and output increases.

In analyzing the effect of the oil and mining industries on recent house price trends, to determine whether a state has significant employment in the such fields, data are used from the Bureau of Labor Statistics' Quarterly Census of Employment and Wages (QCEW). For each state and county in the country, the QCEW reports the number of workers who work in different industry classifications. The QCEW uses the North American Industry Classification System (NAICS), a standard classification scheme that has been in place since the late 1990s. Worker counts are given for broad NAICS "business sectors," as well as for finer-resolution units of categorization (e.g., "subsectors," "industry groups," etc.).

This analysis focuses on the share of employment in NAICS code "21," which represents "Mining, Quarrying, and Oil and Gas Extraction" (hereafter, the "MQOGE" sector). When the share of employment in the sector is compared across states, there is a relatively clear

breakpoint in the distribution at about 2 percent.<sup>1</sup> Accordingly, for the empirical work in this article, the eight states where MQOGE sector employment accounts for more than two percent of all employment are identified and compared to other states. The eight “high-MQOGE” states include: Alaska, Wyoming, North Dakota, West Virginia, New Mexico, Oklahoma, Louisiana, and Texas.

Figure 1 compares five-year house price changes (i.e., the change between the third quarter of 2006 and 2011) for the eight high-MQOGE states against price changes in other states. Price changes are calculated using FHFA’s purchase-only house price indexes. The figure clearly indicates that the high-MQOGE states have fared much better than others. While the average house price decline in the country as a whole was 19 percent over the five-year interval, the price changes for the high-MQOGE states ranged between -12 percent (New Mexico) to +17 percent (North Dakota). Among the eight states, New Mexico was the only one to experience a decline in home prices.

While certainly suggestive that developments in the oil and mining industry may have supported housing markets, Figure 1 is not definitive. Having experienced more modest price increases during the housing boom, rural states have generally experienced more muted price declines in the housing bust. The eight high-MQOGE states are relatively rural and, consistent with other rural states’ experience, saw home prices grow at below-average rates prior to the bust.<sup>2</sup> Accordingly, the observed phenomenon for the eight states may merely be a function of the rural nature of those states.

One way of focusing more directly on the housing market impact of the commodities boom involves splitting each of the eight states into high and low MQOGE subareas. Using the two percent threshold for MQOGE employment, counties within the respective states are classified as having high or low MQOGE employment. Then, the high- and low-MQOGE areas are aggregated and separate house price indexes are estimated for the two county types in each state. Price changes for the high-MQOGE counties can then be compared against price changes for other counties in the same state.

Table 1 reports the results of such an analysis.<sup>3</sup> With high-MQOGE counties showing greater price appreciation than other counties in seven of the eight states, the table provides strong evidence that housing market have been bolstered by strength in the oil

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<sup>1</sup> Only three states (Montana, Kentucky, and Nevada) have MQOGE employment shares of between one and two percent, with the greatest being Montana at 1.6 percent. Other states have less than one percent of their labor force in the MQOGE sector.

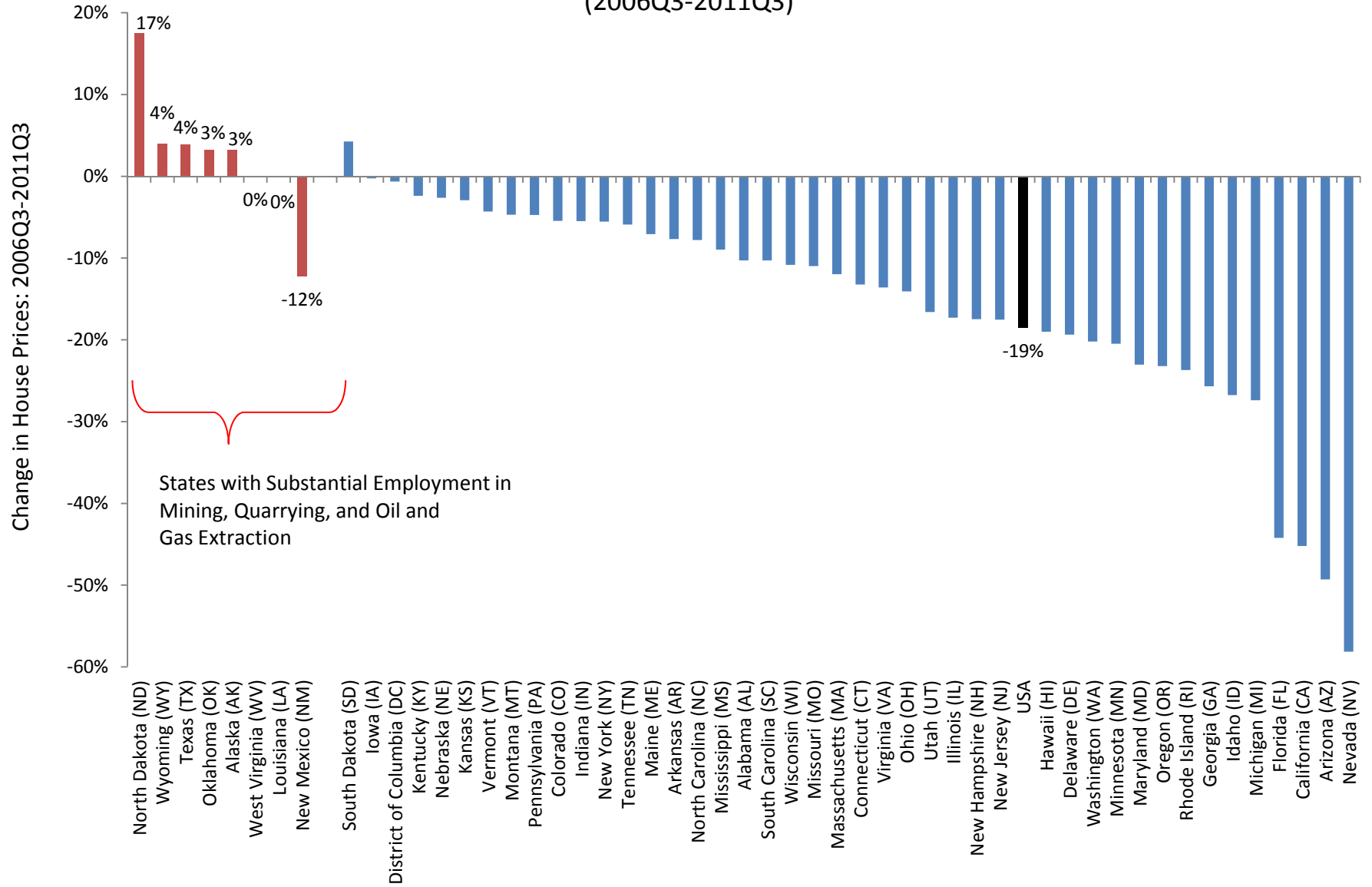
<sup>2</sup> Between the third quarters of 2001 and 2006, the price growth for the eight high-MQOGE states averaged 40.3 percent, well below the 46.8 percent increase for the U.S. as a whole.

<sup>3</sup> To ensure that sample sizes are sufficient for reliable index estimation, in forming the underlying indexes, appraisal values from refinance mortgages are used along with sales price data. As indicated previously, the statewide results shown in Figure 1, by contrast, use “purchase-only” indexes formed exclusively with sales price data. As a result, the average of the sub-area price changes reported in Table 1 does not always closely resemble the results shown in Figure 1.

and mining industries. Indeed, in some states the difference is quite large. In three states—West Virginia, North Dakota, and New Mexico—the difference in price appreciation exceeded ten percentage points.

In North Dakota, where the oil industry has taken advantage of new technologies to dramatically expand production in the Bakken Shale Formation, home price appreciation has been extraordinary in oil-rich areas. Home prices rose nearly 40 percent in high-MQOGE counties between the third quarters of 2006 and 2011, well above the still-impressive 12 percent increase in the rest of the state. Figure 2 provides a graphical depiction of this divergence, as it shows price movements in the respective areas since 2000. The graph indicates a relatively distinct point of departure between the two series in the 2004-2005 timeframe, when house prices in the high-MQOGE counties began to grow at a much faster rate. Not coincidentally, this time period corresponds relatively closely to the years in which domestic and international oil prices began to rise sharply.

**Figure 1: Five-Year House Price Change as Estimated with FHFA Purchase-Only HPI (2006Q3-2011Q3)**





**Table 1: Differences in Five-Year Price Changes in High-MQOGE Counties vs. Other Counties**

House Price Changes Estimated for 2006Q3-2011Q3 Interval

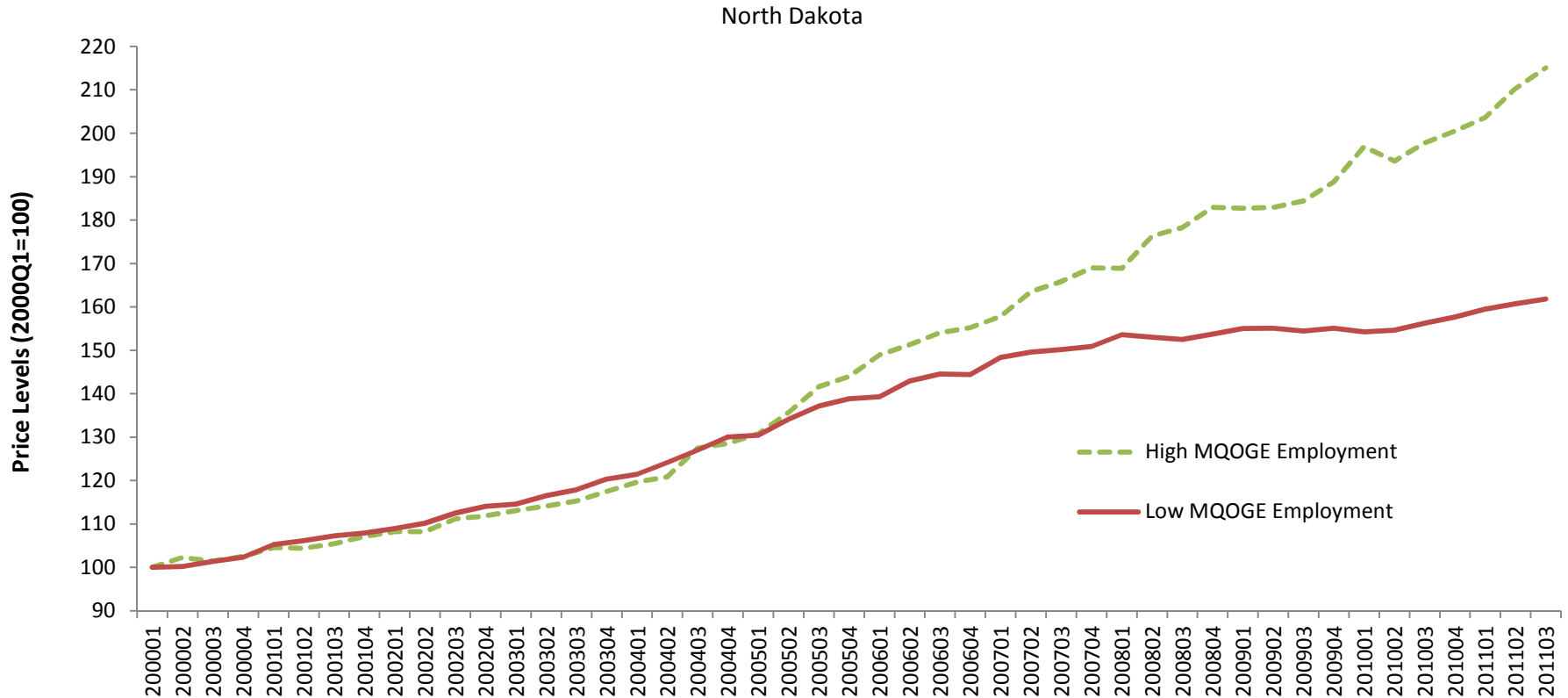
	<i>Price Change in Counties with High MQOGE Employment*</i>	<i>Price Change in Other Counties</i>	<i>Difference</i>
Alaska	4.4%	1.7%	2.7%
Wyoming	6.1%	3.8%	2.4%
North Dakota	39.6%	12.0%	27.6%
West Virginia	8.1%	-4.1%	12.2%
New Mexico	1.9%	-8.2%	10.1%
Oklahoma	4.8%	5.3%	-0.5%
Louisiana	7.6%	0.6%	7.0%
Texas	9.1%	4.7%	4.4%

\* - Counties with two percent or more of their labor force employed in the MQOGE sector are aggregated.

Note: Index estimates have been calculated using mortgage data submitted by Fannie Mae and Freddie Mac in their latest HPI data submissions. Home values from refinance mortgages (appraisals) and purchase-money mortgages (typically purchase prices) are used to construct the indexes.

## Figure 2: Mining, Quarrying, and Oil and Gas Extraction (MQOGE) Business Sector Concentration and Home Prices

Price Trends for Counties with High and Low MQOGE Employment (2000Q1=100)



Note: Counties are designated as having high MQOGE concentration if, according to the Bureau of Labor Statistics' Quarterly Census of Employment, at least two percent of the county labor force in 2010 worked in NAICS Code 21.

Source: Property value information supplied by Fannie Mae and Freddie Mac in their HPI data submissions. Home value from refinance mortgages (appraisals) and purchase-money mortgages (usually sales prices) are used to compute the indexes.