# Highlights: Home Price Appreciation in Rural Areas

The HPI report does not usually include direct measures of appreciation rates in rural areas, owing to data limitations. Occasional analyses, however, have addressed rural price trends. The latest of these, released for the second quarter of 2004, examined inflation-adjusted rural price changes for large geographic regions (Census Divisions) during the prior 25 years.

This article compares rural and urban price trends over a much shorter time horizon—the last five years. The empirical findings suggest that appreciation in rural areas was as dramatic as it was in urban areas during the latest housing boom. The results also indicate that the recent slowdown in price growth has been much more pronounced in urban areas.

The analysis begins by comparing appreciation in more urbanized states against price growth in more rural states. State population densities are used as a measure of urbanization in this case. Later analyses then look within each state and compare appreciation in rural areas with price growth in urban locales. For this work, rural homes are defined as those that are not in a Metropolitan Statistical Area. Using this definition, two states (New Jersey and Rhode Island) and the District of Columbia do not have any "rural" homes. Three other states, Alaska, Massachusetts, and North Dakota, are also omitted from such analysis due to small sample sizes for "rural" homes.

Figure 1 compares price growth in urban states against relatively rural states using OFHEO's usual HPI figures. Five-year appreciation rates are shown for each state and the U.S. as a whole. The graph is arranged in order of population density; the least densely-populated states are on the left and the higher population densities are graphed to the right.

The graph illustrates that more densely-populated states have generally seen some of the most significant price appreciation, but that the difference between high and low-density states is not particularly dramatic. While average five-year appreciation has undoubtedly been higher in urbanized states, a number of rural states have seen substantial price growth. Arizona and Nevada are particularly noteworthy examples, with five-year appreciation of 96 and 103 percent, respectively.

Table 1 compares rural and urban appreciation *within* each state over the last five years. Appreciation rates are calculated using separate rural and urban house price indexes computed for each state.[1]

The table suggests that appreciation in rural areas *within states* generally exceeded price growth in urban areas during the recent housing boom. Rural price growth was higher in 30 of 45 states. In some cases, the relative difference was quite significant. In Colorado, for example, rural price appreciation was double that in urban areas. In Michigan, rural homes appreciated 24.3 percent compared to 15.2 for urban homes.

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[1] These indexes were calculated using the same methodology as is employed in the construction of OFHEO's usual HPI.

While the rural markets showed relative strength, it should be noted that some of the difference may be accounted for by differences in price appreciation across the price spectrum. Because rural homes tend to be less expensive, if the latest price boom had a greater impact on less expensive homes, then the robust price appreciation for rural homes will, in part, be caused by this effect. It also should be recognized that these metrics are statistical measurements, and thus subject to some normal estimation imprecision. Precise measurement for rural home appreciation is particularly difficult, given the lower number of housing transactions that occur in such areas.

While there are differences in rural and urban appreciation, the broad similarity in growth rates in Table 1 is noteworthy. For 33 of the 45 states, the difference in five-year appreciation was less than 10 percentage points. To be sure, the similarity should not be a surprise. Urban and rural housing markets are linked because homeowners can choose where they live and differences in pricing dynamics can motivate homeowners to move. Also, changes in demand factors, such as income levels and unemployment rates, are likely correlated across areas.

Table 2 sharply illustrates the extent to which rural and urban markets are generally correlated by examining price trends in the decade preceding the latest housing boom. The table shows the correlation in rural and urban price movements by state between the second quarter of 1991 and the second quarter of 2001. The reported figure is the correlation coefficient in quarterly price changes, a metric that indicates whether urban and rural prices tend to move in the same direction or in opposite directions. A correlation of 1.0 would indicate that prices always moved in the same direction and -1.0 would indicate that urban and rural prices always moved in opposite direction.

The figures suggest a very high degree of integration. The correlation is positive and exceeds +0.5 for each state. For 18 of the 45 states, the correlation exceeds +0.8, a very high degree of consistency in price movements.

Figure 2 broadly addresses relative appreciation in the most recent quarter. As with Figure 1, the graph looks across states and addresses whether appreciation has been strongest in rural or urban states. The most rural states are again situated to the left and states with increasing levels of population density are graphed on the right. As is evident in the figure, prices in rural states seem to have grown the most over the latest quarter. While national appreciation was 0.86 percent, relatively rural states like Utah, Wyoming, and Idaho had quarterly appreciation between 3 and 5 percent.

Table 3 suggests that, within states, rural markets have been more robust in the recent slowdown. For each state, the table compares rural and urban appreciation between the first and third quarters of this year. Urban price growth exceeded rural appreciation in only nine states, with Hawaii and New Mexico being the most extreme cases. Rural markets were more robust in most states, with some of the largest differences being in the Mountain Census Division (which includes such states as Wyoming, Nevada, and Colorado). Conditions in rural and urban markets were particularly divergent in Nevada and Maine. Urban prices barely changed between the first and third quarters in both states, while rural prices grew at a strong 3.5 percent.
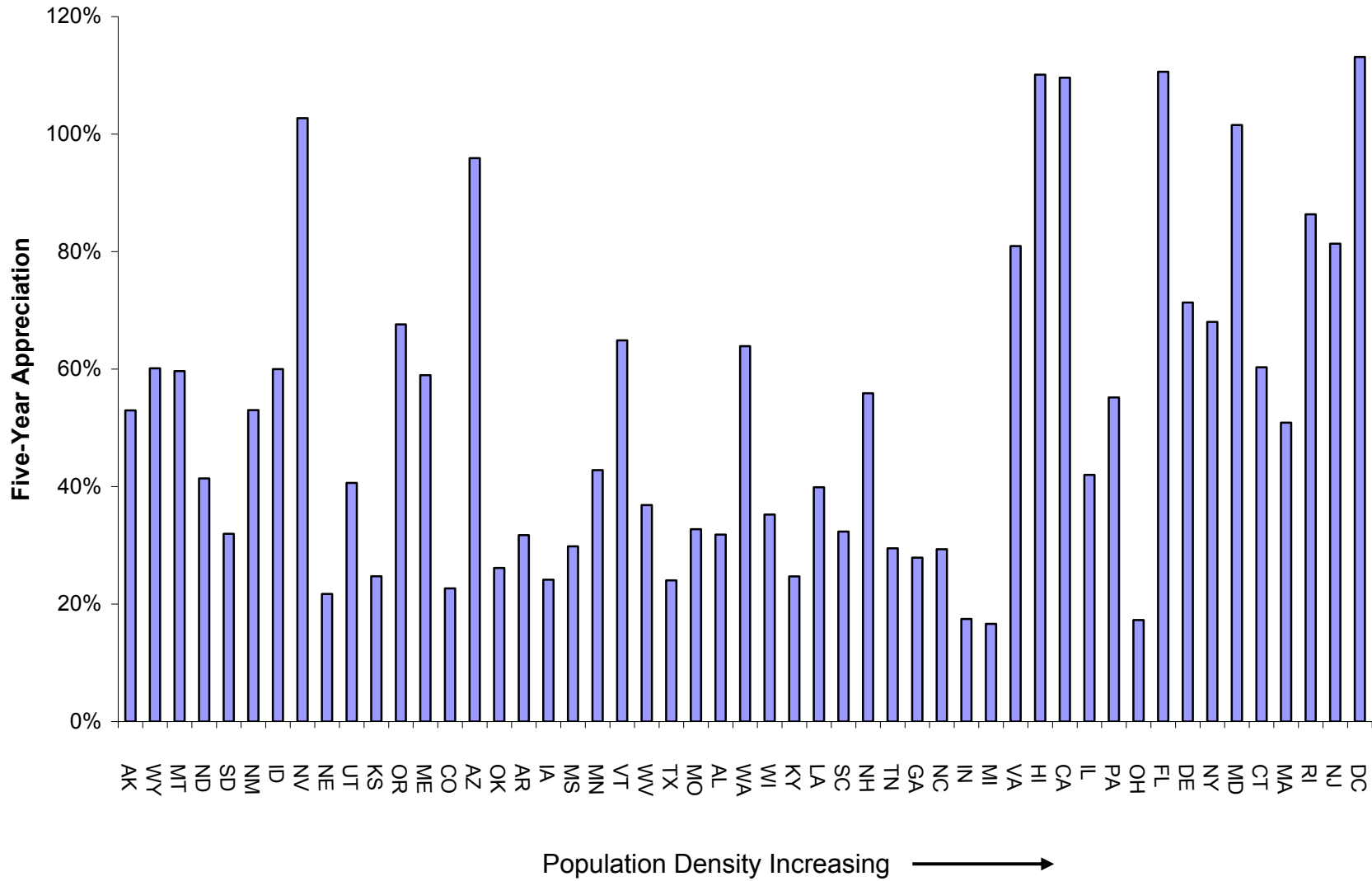
**Figure 1: Five-Year HPI Change and Population Density**
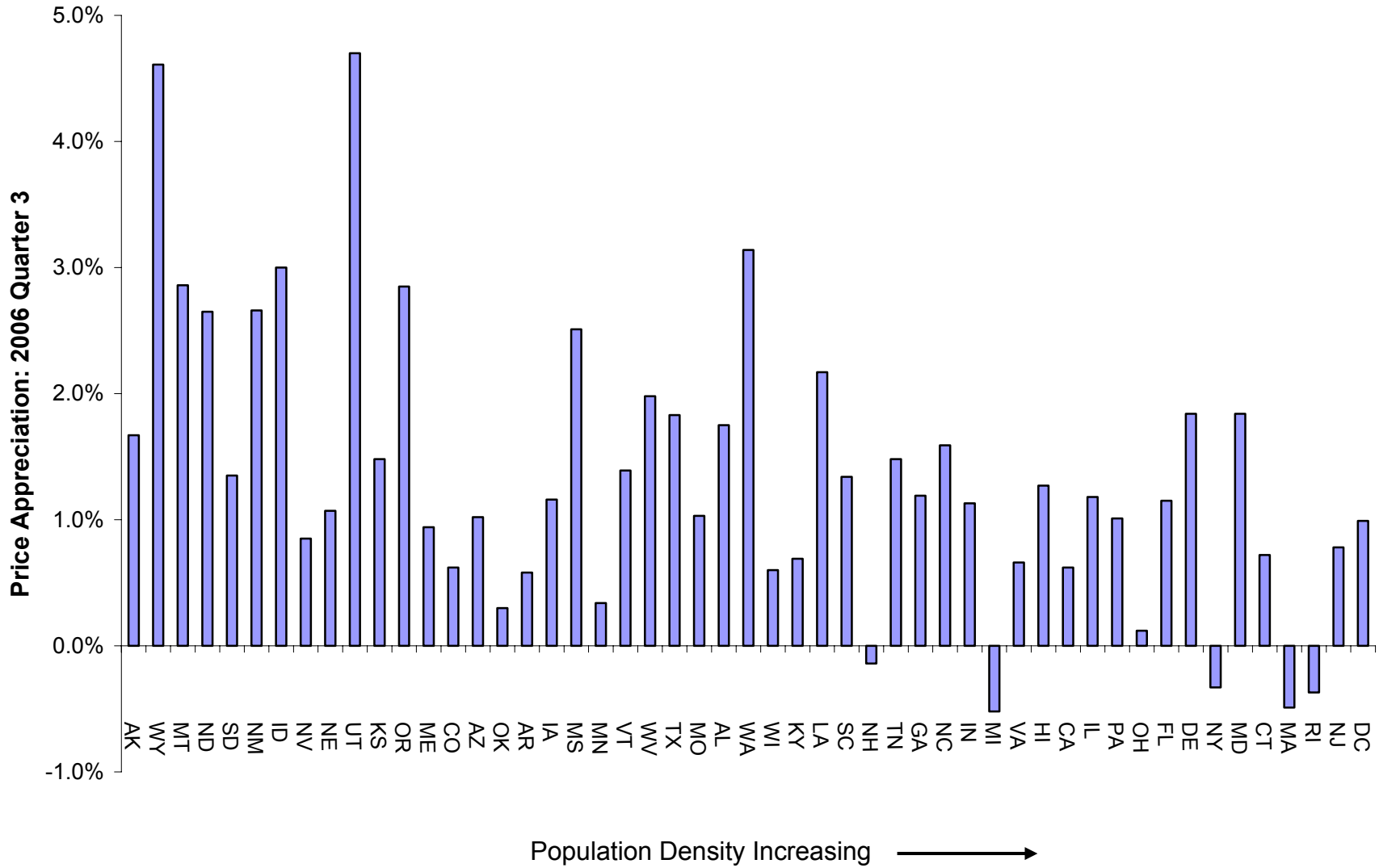
# Figure 2: Quarterly Appreciation Rate for Quarter 3, 2006



Population Density Increasing ⟶

# Table 1: Appreciation Rates by State: Rural vs. Urban

| State | Five-Year Appreciation Rural | Five-Year Appreciation Urban | Difference Rural-Urban |
|---|---|---|---|
| Delaware, (DE) | 92.5% | 69.0% | 23.5% |
| Colorado, (CO) | 41.5% | 20.5% | 21.0% |
| New Hampshire, (NH) | 68.8% | 51.7% | 17.1% |
| Hawaii, (HI) | 119.7% | 105.9% | 13.9% |
| Montana, (MT) | 65.7% | 52.1% | 13.5% |
| South Dakota, (SD) | 39.5% | 27.7% | 11.8% |
| Georgia, (GA) | 37.5% | 26.4% | 11.1% |
| Utah, (UT) | 50.7% | 39.8% | 10.9% |
| Michigan, (MI) | 24.3% | 15.2% | 9.1% |
| North Carolina, (NC) | 35.8% | 27.3% | 8.5% |
| Texas, (TX) | 31.5% | 23.5% | 8.0% |
| Vermont, (VT) | 67.9% | 61.4% | 6.5% |
| Alabama, (AL) | 36.9% | 30.7% | 6.2% |
| Maine, (ME) | 63.6% | 58.0% | 5.6% |
| Wyoming, (WY) | 62.1% | 56.7% | 5.5% |
| Connecticut, (CT) | 65.0% | 59.9% | 5.2% |
| Oregon, (OR) | 71.9% | 66.8% | 5.1% |
| South Carolina, (SC) | 35.8% | 31.8% | 3.9% |
| West Virginia, (WV) | 39.7% | 35.8% | 3.9% |
| Oklahoma, (OK) | 28.6% | 25.3% | 3.3% |
| Nebraska, (NE) | 23.8% | 21.0% | 2.8% |
| Kansas, (KS) | 26.6% | 24.0% | 2.6% |
| Kentucky, (KY) | 26.5% | 24.2% | 2.2% |
| Indiana, (IN) | 18.7% | 17.3% | 1.4% |
| Tennessee, (TN) | 30.6% | 29.2% | 1.4% |
| Ohio, (OH) | 18.5% | 17.1% | 1.3% |
| Arizona, (AZ) | 97.4% | 96.1% | 1.3% |
| Missouri, (MO) | 33.5% | 32.6% | 0.9% |
| Iowa, (IA) | 24.6% | 24.0% | 0.6% |
| Wisconsin, (WI) | 35.6% | 35.2% | 0.4% |
| Minnesota, (MN) | 42.6% | 42.8% | -0.3% |
| Washington, (WA) | 63.3% | 64.0% | -0.7% |
| Louisiana, (LA) | 38.6% | 40.1% | -1.5% |
| Florida, (FL) | 108.6% | 110.7% | -2.1% |
| Maryland, (MD) | 97.6% | 101.8% | -4.2% |
| Idaho, (ID) | 56.7% | 61.2% | -4.5% |
| California, (CA) | 105.2% | 109.8% | -4.6% |
| Mississippi, (MS) | 26.4% | 31.9% | -5.5% |
| Pennsylvania, (PA) | 49.6% | 55.6% | -6.0% |
| Arkansas, (AR) | 26.8% | 33.1% | -6.3% |
| Nevada, (NV) | 96.9% | 103.5% | -6.6% |
| New Mexico, (NM) | 44.3% | 54.9% | -10.6% |
| Virginia, (VA) | 70.2% | 82.0% | -11.7% |
| Illinois, (IL) | 29.0% | 43.2% | -14.2% |
| New York, (NY) | 51.1% | 68.8% | -17.6% |

## Table 2: Correlation of Quarterly Price Changes
## Rural vs. Urban Markets for 1991Q2 - 2001Q2

| State | Correlation Coefficient (1 = Perfect Co-movement, -1 = Opposite movements) |
|---|---|
| California, (CA) | 0.968 |
| New Hampshire, (NH) | 0.940 |
| Utah, (UT) | 0.922 |
| Michigan, (MI) | 0.889 |
| Oregon, (OR) | 0.883 |
| Connecticut, (CT) | 0.877 |
| Colorado, (CO) | 0.869 |
| Minnesota, (MN) | 0.866 |
| New Mexico, (NM) | 0.862 |
| New York, (NY) | 0.843 |
| Maryland, (MD) | 0.838 |
| Virginia, (VA) | 0.834 |
| Illinois, (IL) | 0.830 |
| Florida, (FL) | 0.823 |
| Pennsylvania, (PA) | 0.822 |
| Missouri, (MO) | 0.819 |
| Delaware, (DE) | 0.812 |
| Georgia, (GA) | 0.809 |
| Maine, (ME) | 0.794 |
| Texas, (TX) | 0.779 |
| Wisconsin, (WI) | 0.747 |
| North Carolina, (NC) | 0.746 |
| Ohio, (OH) | 0.741 |
| Washington, (WA) | 0.736 |
| South Carolina, (SC) | 0.736 |
| Idaho, (ID) | 0.729 |
| Hawaii, (HI) | 0.725 |
| Alabama, (AL) | 0.706 |
| Iowa, (IA) | 0.696 |
| Nevada, (NV) | 0.694 |
| Kansas, (KS) | 0.693 |
| Nebraska, (NE) | 0.683 |
| Indiana, (IN) | 0.681 |
| Arizona, (AZ) | 0.674 |
| Kentucky, (KY) | 0.671 |
| Tennessee, (TN) | 0.658 |
| Montana, (MT) | 0.641 |
| Vermont, (VT) | 0.627 |
| Louisiana, (LA) | 0.618 |
| Arkansas, (AR) | 0.612 |
| West Virginia, (WV) | 0.594 |
| Mississippi, (MS) | 0.589 |
| Oklahoma, (OK) | 0.589 |
| Wyoming, (WY) | 0.588 |
| South Dakota, (SD) | 0.552 |

## Table 3: Recent Price Appreciation by State: Rural vs. Urban

| State | Appreciation in Last Two Quarters Rural | Appreciation in Last Two Quarters Urban | Rural vs. Urban Difference |
|---|---|---|---|
| Wyoming, (WY) | 9.3% | 4.3% | 5.0% |
| Maine, (ME) | 3.4% | 0.2% | 3.2% |
| Nevada, (NV) | 3.6% | 0.5% | 3.1% |
| Colorado, (CO) | 4.5% | 1.5% | 3.0% |
| Texas, (TX) | 6.3% | 3.7% | 2.6% |
| Georgia, (GA) | 4.2% | 2.0% | 2.3% |
| Tennessee, (TN) | 5.6% | 3.4% | 2.2% |
| Kansas, (KS) | 4.2% | 2.1% | 2.1% |
| Arkansas, (AR) | 4.2% | 2.2% | 2.0% |
| New York, (NY) | 2.4% | 0.6% | 1.8% |
| South Dakota, (SD) | 4.4% | 2.6% | 1.8% |
| Montana, (MT) | 7.6% | 5.9% | 1.7% |
| New Hampshire, (NH) | 1.3% | -0.3% | 1.6% |
| Oklahoma, (OK) | 3.1% | 1.6% | 1.4% |
| Indiana, (IN) | 2.3% | 1.0% | 1.3% |
| Missouri, (MO) | 2.7% | 1.4% | 1.3% |
| Michigan, (MI) | -0.3% | -1.5% | 1.3% |
| Nebraska, (NE) | 2.7% | 1.6% | 1.1% |
| Arizona, (AZ) | 5.0% | 4.0% | 1.0% |
| Minnesota, (MN) | 1.3% | 0.4% | 0.9% |
| Kentucky, (KY) | 2.7% | 1.8% | 0.9% |
| Utah, (UT) | 10.1% | 9.2% | 0.9% |
| Mississippi, (MS) | 6.2% | 5.3% | 0.9% |
| Washington, (WA) | 7.8% | 7.0% | 0.8% |
| Pennsylvania, (PA) | 3.4% | 2.7% | 0.7% |
| Idaho, (ID) | 8.1% | 7.4% | 0.7% |
| Florida, (FL) | 4.4% | 3.8% | 0.7% |
| Vermont, (VT) | 4.4% | 3.9% | 0.5% |
| Wisconsin, (WI) | 1.3% | 1.0% | 0.3% |
| Illinois, (IL) | 2.7% | 2.5% | 0.3% |
| California, (CA) | 2.3% | 2.1% | 0.3% |
| Maryland, (MD) | 4.6% | 4.4% | 0.2% |
| Louisiana, (LA) | 5.2% | 5.2% | 0.1% |
| Alabama, (AL) | 3.9% | 3.9% | 0.1% |
| North Carolina, (NC) | 3.5% | 3.5% | 0.0% |
| Ohio, (OH) | 0.0% | 0.0% | 0.0% |
| Connecticut, (CT) | 1.5% | 1.6% | -0.1% |
| West Virginia, (WV) | 2.0% | 2.7% | -0.7% |
| Iowa, (IA) | 1.5% | 2.8% | -1.3% |
| South Carolina, (SC) | 2.0% | 3.4% | -1.4% |
| Virginia, (VA) | 1.2% | 2.9% | -1.7% |
| Delaware, (DE) | 2.0% | 3.8% | -1.8% |
| Oregon, (OR) | 5.5% | 7.6% | -2.1% |
| Hawaii, (HI) | 0.6% | 3.9% | -3.4% |
| New Mexico, (NM) | 2.7% | 7.6% | -4.8% |