

# News Release

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BEA 23-61

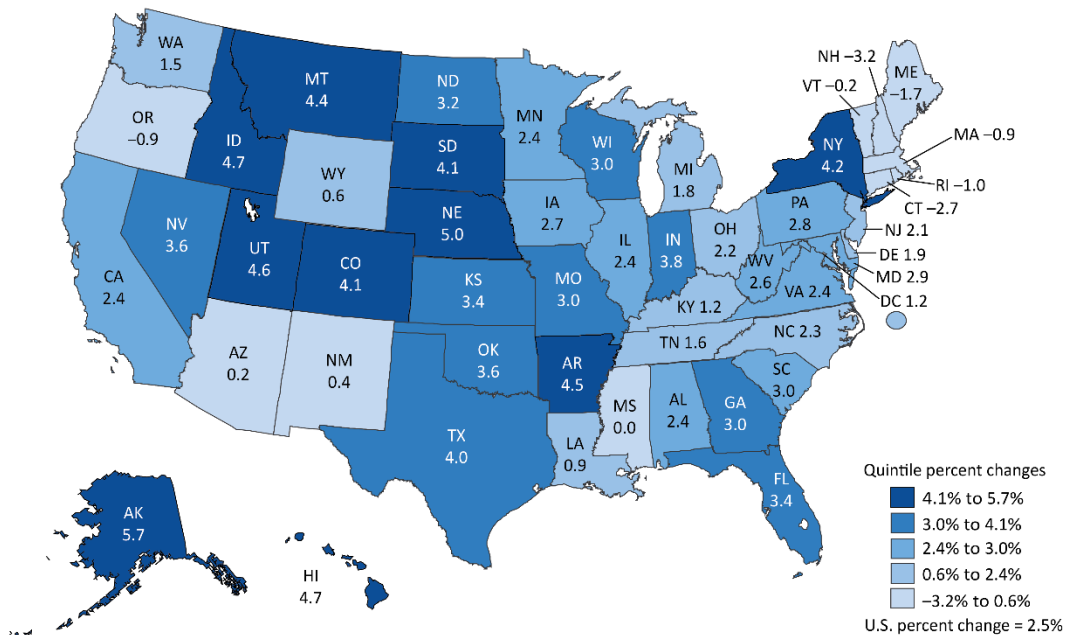
Technical: Eric Figueroa 301-278-9328 [RPP@bea.gov](mailto:RPP@bea.gov)  
Media: Connie O’Connell 301-278-9003 [Connie.OConnell@bea.gov](mailto:Connie.OConnell@bea.gov)

## Real Personal Consumption Expenditures by State and Real Personal Income by State and Metropolitan Area, 2022

**Real personal consumption expenditures (PCE) by state** increased in 42 states and the District of Columbia in 2022, with the percent change ranging from 5.7 percent in Alaska to –3.2 percent in New Hampshire (table 1), according to statistics released today by the U.S. Bureau of Economic Analysis (BEA).

**Real personal income** declined in 45 states and the District of Columbia in 2022, with the percent change ranging from 3.0 percent in North Dakota to –8.9 percent in Rhode Island (table 1).

Real Personal Consumption Expenditures for States: Percent Change, 2021–2022



U.S. Bureau of Economic Analysis

Regional estimates of real PCE and real personal income are the current-dollar estimates adjusted by the corresponding regional price parity (RPP) and the national PCE price index. In 2022, the national PCE price index increased 6.5 percent (table 2).

### Real personal consumption expenditures

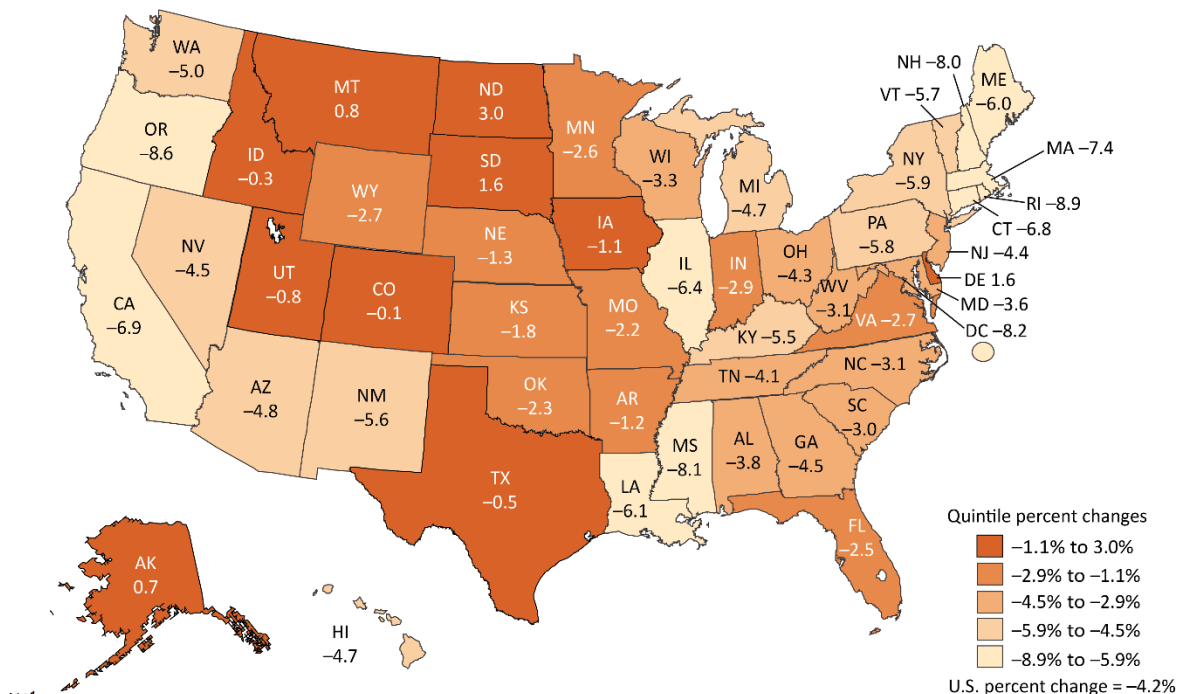
Real PCE for the nation increased 2.5 percent in 2022. Current-dollar PCE (see "[Consumer Spending by State](#)") increased 9.2 percent, faster than the national PCE price index.

- Alaska had the largest increase in real PCE, at 5.7 percent. Current-dollar PCE increased 9.5 percent, while its implicit regional price deflator increased 3.6 percent (table 2).
- Nebraska had the second-largest increase in real PCE, at 5.0 percent. Current-dollar PCE increased 9.2 percent, while its implicit regional price deflator increased 4.0 percent.
- New Hampshire had the largest decline in real PCE, at 3.2 percent. Current-dollar PCE increased 8.2 percent, while its implicit regional price deflator increased 11.8 percent.

### Real personal income

Real personal income for the nation declined 4.2 percent in 2022. Current-dollar personal income (see "[Personal Income by State](#)") increased 2.0 percent, slower than the national PCE price index.

Real Personal Income for States: Percent Change, 2021–2022



U.S. Bureau of Economic Analysis

- North Dakota had the largest increase in real personal income, at 3.0 percent. Current-dollar personal income increased 7.0 percent, while its implicit regional price deflator increased 3.8 percent.
- Delaware had the second-largest increase in real personal income, at 1.6 percent. Current-dollar

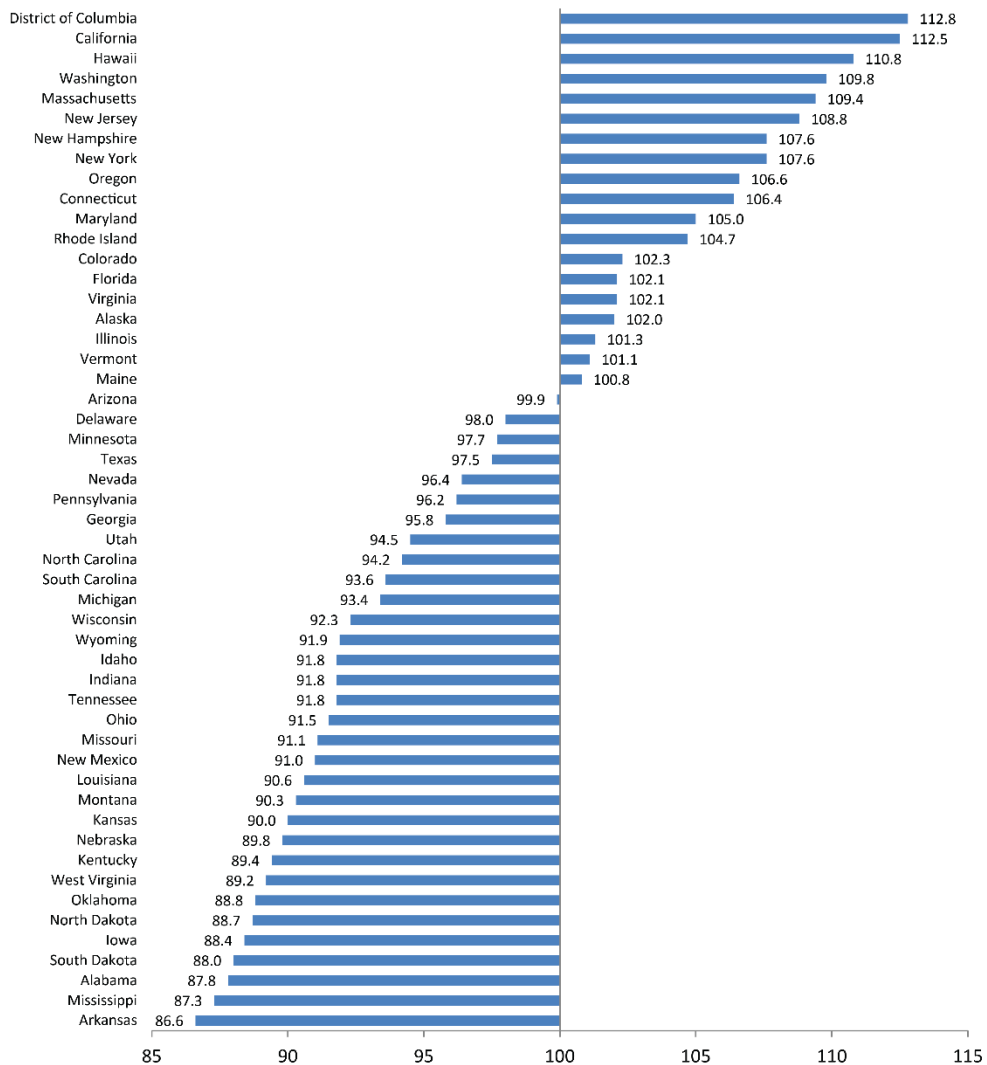
personal income increased 8.8 percent, while its implicit regional price deflator increased 7.0 percent.

- Rhode Island had the largest decline in real personal income, at 8.9 percent. Current-dollar personal income declined 0.5 percent, while its implicit regional price deflator increased 9.2 percent.

### Regional price parities

Regional price parities measure the differences in price levels across states for a given year and are expressed as a percentage of the overall national price level.

Chart 1. Regional Price Parities for States, 2022 (U.S. = 100)



U.S. Bureau of Economic Analysis

The all items RPP covers all consumption goods and services including housing rents. Areas with high/low RPPs typically correspond to areas with high/low price levels for rents.

- States with the highest RPPs were California, at 112.5, Hawaii, at 110.8, and Washington, at 109.8; the RPP in the District of Columbia was 112.8 (table 2).
- States with the lowest RPPs were Arkansas, at 86.6, Mississippi, at 87.3, and Alabama, at 87.8.
- Across states, California had the highest RPP for housing rents, at 160.2, and West Virginia had the lowest, at 53.9; the RPP for housing rents in the District of Columbia was 177.2.

Metropolitan area real personal income statistics are available in tables 3 and 4 as well as on [BEA's website](#).

### **Annual update to regional real PCE and real personal income**

The estimates for 2022 incorporate the results of BEA's comprehensive update of real PCE by state and real personal income by state and metropolitan area that was also released today. The annual estimates of real PCE by state and real personal income by state and metropolitan area from 2008 to 2021 were revised. These updates incorporate new and revised source data that are more complete and more detailed than previously available as well as the results of the comprehensive updates of BEA's National Economic Accounts, annual PCE by state accounts, and annual regional personal income accounts that were published earlier. Our online journal, the *Survey of Current Business*, will include an article in 2024 describing the results of BEA's comprehensive update of regional real PCE and real personal income statistics.

BEA also released new estimates of state real per capita PCE statistics and real per capita personal income for 2022, along with revised estimates for 2008 to 2021. BEA used U.S. Census Bureau (Census) population figures to calculate per capita estimates for 2008, 2009, and 2020 through 2022. For 2010 through 2019, BEA used intercensal population statistics that it developed based on Census methodology. See "[Note on Per Capita Personal Consumption Expenditures and Population](#)."

Next release: December 12, 2024, at 8:30 a.m. EST  
Real Personal Consumption Expenditures by State and  
Real Personal Income by State and Metropolitan Area, 2023

## Technical Notes on Regional Price Parities and Implicit Regional Price Deflators

Price indexes commonly measure price changes over time. The U.S. Bureau of Economic Analysis (BEA) Personal Consumption Expenditures (PCE) price index and the U.S. Bureau of Labor Statistics (BLS) Consumer Price Index (CPI) are two examples. Spatial price indexes measure price level differences across regions for one period. An example of these types of indexes are purchasing power parities, which measure differences in price levels across countries for a given period and can be used to convert estimates of per capita gross domestic product into comparable levels in a common currency. The RPP that BEA has developed compares regions within the United States, without the need for currency conversion. An implicit regional price deflator (IRPD) can be derived by combining the regional price parities (RPPs) and the U.S. PCE price index.

**Regional price parities.** The RPPs are calculated using price quotes for a wide array of items from the CPI covering apparel, education, food, housing, medical, recreation, transportation, and other goods and services.<sup>1</sup> Data on housing rents are obtained separately from the U.S. Census Bureau's American Community Survey (ACS). The expenditure weights for each category are constructed using BEA PCE and Census ACS housing rents expenditures.<sup>2</sup>

The CPI price levels and the ACS housing rents are combined with the expenditure weights using a multilateral aggregation method that expresses a region's price level relative to that of the United States.<sup>3</sup>

For example, if the RPP for area A is 120 and for area B is 90, then price levels are 20 percent higher and 10 percent lower than the U.S. average for A and B, respectively. If the personal income for area A is \$12,000 and for area B is \$9,000, then RPP-adjusted incomes are \$10,000 (or \$12,000/1.20) and \$10,000 (or \$9,000/0.90), respectively. In other words, the purchasing power of the two incomes is equivalent when adjusted by their respective RPPs.

**Implicit regional price deflator.** The IRPD is a regional price index derived as the product of two terms: the RPP and the U.S. PCE price index.

The IRPD will equal current-dollar PCE divided by real PCE in constant dollars. The growth rate or year-to-year change in the IRPDs is a measure of regional inflation.<sup>4</sup>

For complete information on the data sources and estimating methods, see "[Regional Price Parities, Real Personal Consumption Expenditures, and Real Personal Income](#)."

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1. The BEA RPP statistics are based in part on restricted access CPI data from BLS. The BEA statistics presented herein are products of BEA and not BLS.

2. To estimate RPPs, annual average CPI price quotes and ACS housing rents are quality adjusted. The rents data are from the ACS Public Use Microdata Sample, and results incorporate BEA's new method for estimating housing services across the regional and national accounts. For more information, see the [May 2021 issue of the Survey of Current Business](#).

3. The multilateral system that is used is the Geary additive method. Any region or combination of regions may be used as the base or reference region without loss of consistency.

4. The growth rate of the IRPDs will not necessarily equal the region or metropolitan area price deflators published by BLS. This is because the CPI deflators are calculated directly, while the IRPDs are indirect estimates based on CPI and ACS price levels and PCE expenditure weights.

## Additional Information

### Resources

- Stay informed about BEA developments by reading [The BEA Wire](#), signing up for BEA's [email subscription service](#), or following [@BEA\\_News](#) on X, formerly known as Twitter.
- Historical time series for these estimates can be accessed in BEA's [Interactive Data Application](#).
- Access BEA data by registering for BEA's [Data Application Programming Interface](#).
- For more on BEA's statistics, see our online journal, the [Survey of Current Business](#).
- For upcoming economic indicators, see BEA's [news release schedule](#).
- For complete information on the data sources and estimating methods used to estimate regional price parities, real personal consumption expenditures, and real personal income, see "[Regional Price Parities, Real Personal Consumption Expenditures, and Real Personal Income](#)."

### Definitions

**Regional price parities (RPPs)** are regional price levels expressed as a percentage of the overall national price level for a given year. The price level is determined by the average prices paid by consumers for the mix of goods and services consumed in each region.

Detailed Consumer Price Index (CPI) price data are adjusted to obtain average price levels for the U.S. Bureau of Labor Statistics areas.<sup>1</sup> These are allocated to counties in combination with direct price and expenditure data on housing rents from the American Community Survey.

County data are then aggregated to states and metropolitan areas.

**Personal consumption expenditures (PCE) at RPPs** is current-dollar PCE divided by the price parity for a given year and region.<sup>2</sup>

**Real PCE** is PCE at RPPs divided by the national PCE price index. The result is real PCE in constant dollars (using 2017 as the reference year). Using Minnesota in 2022 as an example:

(1)	(2)	(3)
PCE is divided by the RPP	PCE at RPPs is deflated by the U.S. PCE price index	<b>2022 Minnesota real PCE</b>
\$30.2 / 0.977 = \$30.9	\$30.9 / 1.160 = \$26.6	<b>\$26.6</b>

Note. Dollar amounts are in billions.

Total real PCE in the United States is derived as the sum of the regional estimates and net expenditures abroad by U.S. residents divided by the U.S. PCE price index.

**Personal income at RPPs** is current-dollar personal income divided by the price parity for a given year and region. A balancing factor is applied so that the sum of personal income at RPPs across regions equals the current-dollar sum.

**Real personal income** is personal income at RPPs divided by the national PCE price index. The result is real personal income in constant dollars (using 2017 as the reference year).

Estimates of real personal income in the United States are derived as the sum of the regional estimates divided by the U.S. PCE price index.

**Implicit regional price deflator** is the product of the RPP and the national PCE price index. It is equal to current-dollar PCE divided by real PCE.

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### News release tables

Table 1. Real Personal Consumption Expenditures and Real Personal Income, by State, 2021–2022

Table 2. Regional Price Parities and Implicit Regional Price Deflators, by State, 2022

Table 3. Real Personal Income, by Metropolitan Area, 2021–2022

Table 4. Regional Price Parities and Implicit Regional Price Deflators, by Metropolitan Area, 2022

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1. The CPI represents about 93 percent of the total U.S. population, including almost all residents of urban or metropolitan areas.

2. RPP should first be divided by 100.