

# Personal Consumption Expenditures by State

## New Statistics for 2016 and Updated Statistics for 2014 and 2015

By Christian Awuku-Budu, Terence Fallon, Solomon Kublashvili, and Steven Zemanek

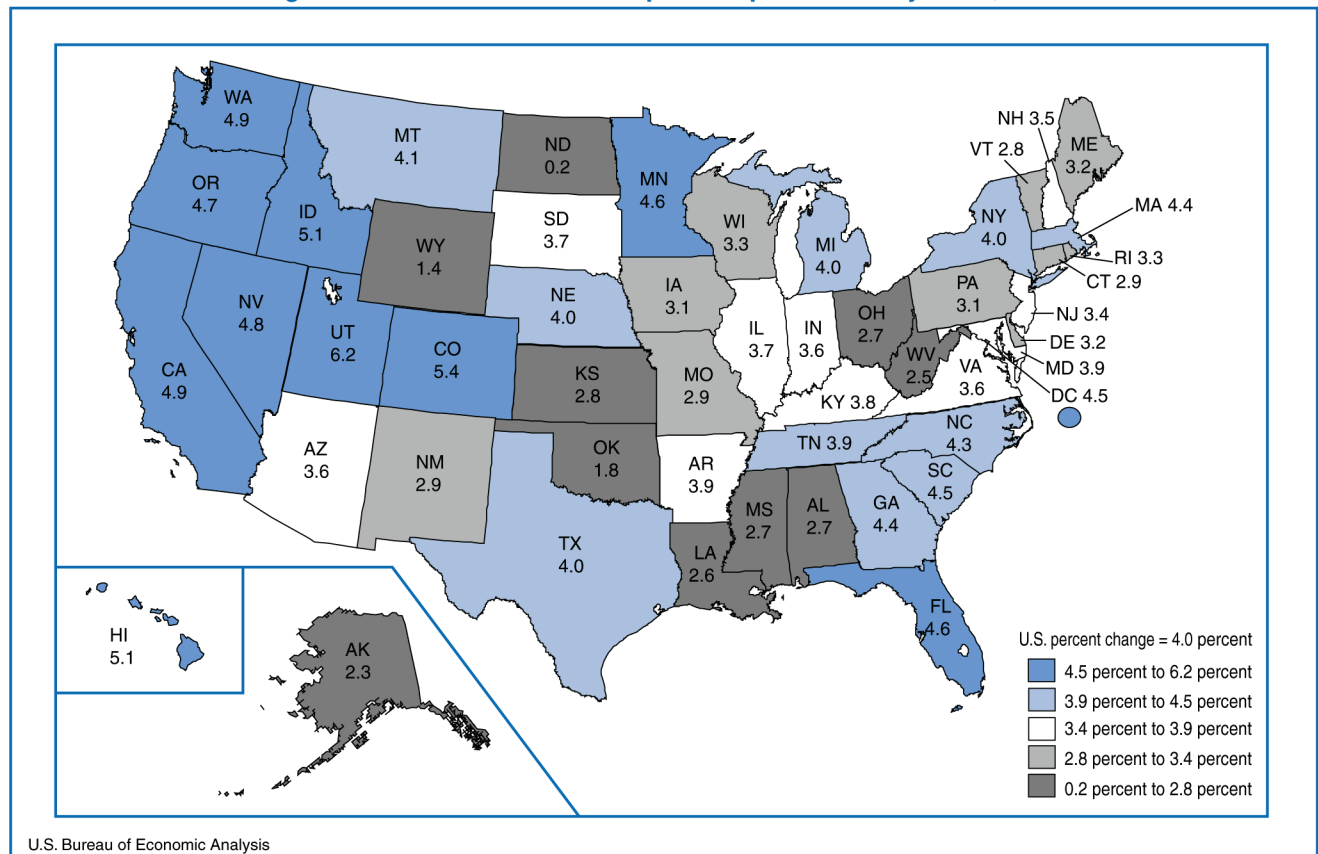
ON OCTOBER 4, 2017, the Bureau of Economic Analysis (BEA) released current-dollar statistics on personal consumption expenditures (PCE) by state for 2016. Current-dollar PCE grew 4.0 percent nationwide in 2016, ranging from a low of 0.2 percent in North Dakota to a high of 6.2 percent in Utah (chart 1). Most states' PCE growth in 2016 was similar to growth in 2015, as PCE growth nationwide was identical for both years (table 1).

PCE by state is a comprehensive measure of household consumption at the state level and reflects the value of the goods and services purchased by, or on behalf of, households by state of residence. These statistics provide a general indication of household consumption patterns across states and over time, and show how households allocate their spending between goods and services or between necessities and discretionary items. PCE by state statistics complement

BEA's other regional statistics, including personal income and GDP by state, and can be used to show how consumers adjust their spending in reaction to economic developments.

While PCE grew 4.0 percent nationwide, per capita PCE grew 3.2 percent. The per capita measure removes the effect of population change from the growth rate. States with the fastest PCE growth were not necessarily the states with the fastest per capita PCE growth. Hawaii (4.9 percent), California (4.2 percent), and Utah (4.1 percent) had the fastest per capita PCE growth in 2016 (table 2). Utah, which was the fastest-growing state for total PCE, was the third fastest growing state on a per capita basis because it was the state with the fastest population growth in 2016. Colorado and Idaho, also states with fast PCE growth in 2016, are not among the top five fastest growing states on a per capita basis, also because of strong population growth.

**Chart 1. Percent Change in Total Personal Consumption Expenditures by State, 2015–2016**



**Table 1. Total Personal Consumption Expenditures (PCE) by State, Percent Change from Preceding Period, 2015 and 2016**

Area	2015	2016
<b>United States<sup>1</sup></b> .....	<b>4.0</b>	<b>4.0</b>
<b>New England</b> .....	<b>3.5</b>	<b>3.7</b>
Connecticut.....	2.3	2.9
Maine.....	2.4	3.2
Massachusetts.....	4.6	4.4
New Hampshire.....	2.9	3.5
Rhode Island.....	3.4	3.3
Vermont.....	2.7	2.8
<b>Mideast</b> .....	<b>3.3</b>	<b>3.6</b>
Delaware.....	3.9	3.2
District of Columbia.....	5.3	4.5
Maryland.....	3.7	3.9
New Jersey.....	3.3	3.4
New York.....	3.3	4.0
Pennsylvania.....	3.0	3.1
<b>Great Lakes</b> .....	<b>3.3</b>	<b>3.5</b>
Illinois.....	3.6	3.7
Indiana.....	2.9	3.6
Michigan.....	3.7	4.0
Ohio.....	3.0	2.7
Wisconsin.....	3.0	3.3
<b>Plains</b> .....	<b>3.4</b>	<b>3.4</b>
Iowa.....	2.8	3.1
Kansas.....	2.9	2.8
Minnesota.....	4.1	4.6
Missouri.....	3.4	2.9
Nebraska.....	3.3	4.0
North Dakota.....	2.4	0.2
South Dakota.....	3.2	3.7
<b>Southeast</b> .....	<b>4.2</b>	<b>4.0</b>
Alabama.....	2.6	2.7
Arkansas.....	2.7	3.9
Florida.....	6.1	4.6
Georgia.....	3.9	4.4
Kentucky.....	3.5	3.8
Louisiana.....	3.1	2.6
Mississippi.....	2.3	2.7
North Carolina.....	4.0	4.3
South Carolina.....	3.8	4.5
Tennessee.....	4.1	3.9
Virginia.....	3.5	3.6
West Virginia.....	2.7	2.5
<b>Southwest</b> .....	<b>3.9</b>	<b>3.7</b>
Arizona.....	3.4	3.6
New Mexico.....	2.5	2.9
Oklahoma.....	2.3	1.8
Texas.....	4.4	4.0
<b>Rocky Mountain</b> .....	<b>5.3</b>	<b>5.2</b>
Colorado.....	5.7	5.4
Idaho.....	4.8	5.1
Montana.....	4.8	4.1
Utah.....	5.8	6.2
Wyoming.....	1.6	1.4
<b>Far West</b> .....	<b>4.9</b>	<b>4.8</b>
Alaska.....	3.2	2.3
California.....	5.0	4.9
Hawaii.....	4.1	5.1
Nevada.....	4.5	4.8
Oregon.....	5.6	4.7
Washington.....	5.0	4.9

1. The U.S. values reported differ from the PCE values in the national accounts because PCE by state excludes net expenditures abroad by U.S. residents, which consist of government and private employees' expenditures abroad less personal remittances in kind to nonresidents.

NOTE: Percent change from preceding period was calculated from unrounded data. Expenditures may not sum to higher-level aggregates because of rounding.

## Per Capita PCE by State, 2016

Per capita PCE by state ranged from \$51,981 in Massachusetts to \$30,200 in Mississippi (chart 2). Per capita PCE in the District of Columbia was \$56,843.

Health care and housing and utilities, the two biggest expenditure categories, were the largest contributors to growth in PCE in 2016.

## Housing and utilities

Per capita housing and utilities expenditures were the largest budget share—the ratio of per capita expenditures for a category to total per capita PCE—across all PCE categories nationwide. Per capita expenditures on housing and utilities were \$7,215 nationwide in 2016,

accounting for an 18.2 percent share of all expenditures. New Jersey (\$9,846), Maryland (\$9,738), and Connecticut (\$9,734) had the highest per capita expenditures on housing and utilities, while Arkansas (\$4,791), West Virginia (\$4,872), and Mississippi (\$4,976) had the lowest (table 3).

States with high (low) per capita expenditures on housing and utilities typically correspond to high (low) per capita budget shares. The comparative cost for rents, as measured by the regional price parities, reflected the same trend.<sup>1</sup> For example, the per capita housing and utilities budget shares were larger in Maryland (21.8 percent), New Jersey (20.1 percent), and Connecticut (20.1) than in West Virginia (14.2 percent), Arkansas (15.4 percent) and Mississippi (16.5 percent). Regional price parities for rents were similarly higher in New Jersey (132.8), Maryland (123.9), and Connecticut (116.8) and lower in Mississippi (63.1), Arkansas (63.9), and West Virginia (66.0).

1. 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.

**Table 2. Percent Change From Preceding Period for States With the Largest Growth in PCE and Per Capita PCE, 2016**

	Growth in PCE	Growth in per capita PCE	Population growth
States with largest growth based on PCE			
United States.....	4.0	3.2	0.7
Utah.....	6.2	4.1	2.0
Colorado.....	5.4	3.6	1.7
Hawaii.....	5.1	4.9	0.2
Idaho.....	5.1	3.2	1.8
California.....	4.9	4.2	0.7
States with largest growth based on per capita PCE			
United States.....	4.0	3.2	0.7
Hawaii.....	5.1	4.9	0.2
California.....	4.9	4.2	0.7
Utah.....	6.2	4.1	2.0
Massachusetts.....	4.4	4.0	0.4
New York.....	4.0	4.0	0.0

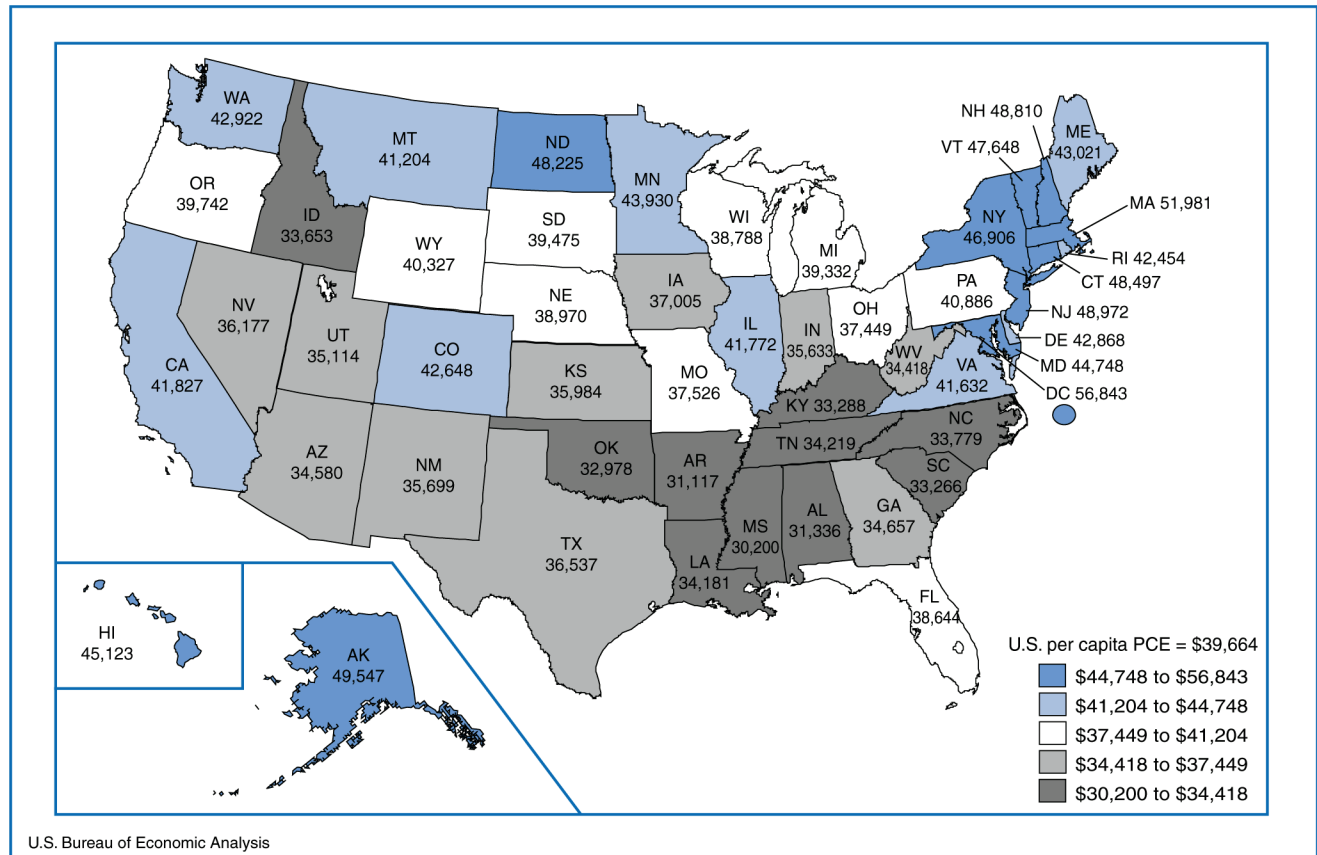
PCE Personal consumption expenditures

**Table 3. Per Capita PCE for Housing and Utilities for Selected States, 2016**

	Per capita PCE by state (dollars)	Per capita PCE budget share	Regional price parities for rents
United States.....	7,215	18.2	101.1
Largest per capita PCE			
New Jersey.....	9,846	20.1	132.8
Maryland.....	9,738	21.8	123.9
Connecticut.....	9,734	20.1	116.8
Smallest per capita PCE			
Arkansas.....	4,791	15.4	63.9
West Virginia.....	4,872	14.2	66.0
Mississippi.....	4,976	16.5	63.1

PCE Personal consumption expenditures

**Chart 2. Per Capita Total Personal Consumption Expenditures by State, 2016**



**Data and Methodology**

The PCE by state statistics use detailed source data by state to create an initial set of annual expenditure estimates for detailed categories.<sup>1</sup> Then, the national PCE categories are allocated to the states using the initial expenditure estimates and aggregated to the publication level.<sup>2</sup> Finally, the expenditures are adjusted for residency when evaluation indicates out-of-state spending exists.

Three primary methods are used to create the initial detailed PCE by state estimates: receipts and expenditures, price times quantity, and other methods. The method used depends on the data that are available for each spending category.

The receipts and expenditures method uses receipts from the Economic Census to create estimates for many

of the expenditure categories. The receipts are adjusted using class-of-customer data by state and other data sources to remove nonhousehold purchases.

For several categories, which include higher education and foreign travel by U.S. residents, the Economic Census lacks the data needed to produce the estimates for PCE by state. A price times quantity method is used to create the estimates, incorporating additional data sources.

For the remaining PCE categories, various other data sources and methods are used to produce the statistics. Financial services and insurance is the largest of the remaining categories, and it uses disposable personal income by state to allocate the national expenditures.<sup>3</sup>

1. This is the level of category detail published in table 2.4.5 in the national income and product accounts (NIPAs).

2. The category detail in the PCE by state statistics corresponds to the category detail published in NIPA table 2.3.5.

3. For more on the data and methodology used, see Christian Awuku-Budu, Mahsa Gholizadeh, Ledia Guci, Joshua S. Ingber, Christopher A. Lucas, and Levi J. Weible, "Personal Consumption Expenditures by State," SURVEY OF CURRENT BUSINESS 96 (November 2016).

## Health care

Per capita health care expenditures exhibited the second largest budget share item across all PCE categories nationwide. Per capita expenditures on health care were \$6,696 for the United States in 2016, accounting for a 16.9 percent share of all expenditures (table 4). Alaska (\$10,299), Massachusetts (\$9,353), and Delaware (\$8,182) had the highest per capita expenditures on health care, while Nevada (\$5,153), Utah (\$5,201), and Arizona (\$5,275) had the lowest.

**Table 4. Per Capita PCE for Health Care for Selected States, 2016**

	Per capita PCE by state (dollars)	Per capita PCE budget share	Median age of the population <sup>1</sup>
United States.....	6,696	16.9	37.9
Largest per capita PCE			
Alaska.....	10,299	20.8	33.9
Massachusetts.....	9,353	18.0	39.4
Delaware.....	8,182	19.1	40.2
Smallest per capita PCE			
Nevada.....	5,153	14.2	37.8
Utah.....	5,201	14.8	30.8
Arizona.....	5,275	15.3	37.6

PCE Personal consumption expenditures  
1. U.S. Census Bureau

A major factor in the differences in per capita health care expenditures by state was the age demographic of each state's population. For example, Utah had the youngest population by median age, at 30.8 years, in the United States in 2016; it also had one of the lowest per capita PCE for health care. Meanwhile, Delaware and Massachusetts each had population median ages above the national average, and both states had high per capita health care expenditures. The median population age in Alaska was below the national average, but Alaska's high per capita health care expenses were affected by the state's smaller population and geographic isolation.

## Annual Update of PCE by State

BEA's October release of PCE by state statistics included revised statistics for 2014 and 2015. The revised

### Data Availability

The statistics on personal consumption expenditures described in this article are available on the BEA Web site. Data are available for 1997–2016 for each state and the District of Columbia and for 16 expenditure categories. Per capita expenditures are also available. Any inquiries about the data can be addressed to [pcebystate@bea.gov](mailto:pcebystate@bea.gov).

statistics incorporated the results of the 2016 annual update of the national income and product accounts and the incorporation of newly available and revised source data, which includes revised data from the Bureau of Labor Statistics' Quarterly Census of Employment and Wages for 2014 and 2015, new 2015 data from the Census Bureau's American Community Survey (ACS), revised 2014 and new 2015 price and volume data for electricity and natural gas from the Energy Information Administration, revised 2014 and 2015 data from BEA's state disposable personal income, and new data from the Centers for Medicare and Medicaid Services (CMS).

The revisions to current-dollar PCE levels were generally small. In 2014, national current-dollar PCE was revised less than 0.01 percent (table 5). At the state level, current-dollar PCE was revised downward in 29 states and the District of Columbia. The remaining states were unrevised or revised upward. Delaware (–0.7 percent), Louisiana (–0.7 percent), and Vermont (–0.5 percent) had the largest downward revisions, while Oregon (0.6 percent), Indiana (0.6 percent), and Alaska (0.4 percent) had the largest upward revisions. The primary source of the updates was the incorporation of new data from the CMS for the health care expenditure estimates.

In 2015, national current-dollar PCE was revised upward 0.4 percent. At the state level, current-dollar PCE was revised upward in 39 states. Florida (1.4 percent), Oregon (1.3 percent), and Iowa (1.1 percent) had the largest positive revisions, while Delaware (–0.7

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percent), Vermont (-0.7 percent), and Louisiana (-0.6 percent) had the largest downward revisions. The primary sources of the revisions were the incorporation of the ACS data into the housing and utilities category and the CMS data into the health care category.

### Ongoing Research

Multiple research projects related to regional PCE statistics are ongoing at BEA. These projects are designed to make further methodological improvements, to expand the category detail of these statistics, and to develop related new statistics.

The statistics scheduled for release in 2018, which will incorporate the comprehensive update of the NIPAs, will revise the PCE by state statistics back to 1997.

Additionally, the use of alternative source data and the introduction of methodological improvements for several PCE categories continue, particularly, the development of residency-based data sources for the measurement of financial services and insurance. This measure currently relies on personal income data.

Longer term considerations include the development of real PCE by state statistics, which would account for differences in prices both across states and over time. With the development of BEA's regional price parities statistics, much of the groundwork for this effort has already been done. Other long term considerations are incorporating detailed transaction data with survey data to improve the residency adjustments of the PCE estimates.

**Table 5. Revisions to Personal Consumption Expenditures (PCE) by State, 2014 and 2015**

	2014			2015		
	Millions of dollars		Percent revision <sup>2</sup>	Millions of dollars		Percent revision <sup>2</sup>
	Revised	Revision		Revised	Revision	
<b>United States<sup>1</sup></b> .....	<b>11,858,228</b>	<b>599</b>	<b>0.0</b>	<b>12,327,828</b>	<b>48,974</b>	<b>0.4</b>
<b>New England</b> .....	<b>674,776</b>	<b>-1,188</b>	<b>-0.2</b>	<b>698,543</b>	<b>956</b>	<b>0.1</b>
Connecticut.....	164,852	-174	-0.1	168,579	-207	-0.1
Maine.....	54,231	85	0.2	55,512	302	0.5
Massachusetts.....	324,352	-767	-0.2	339,150	1,316	0.4
New Hampshire.....	61,146	-156	-0.3	62,943	-190	-0.3
Rhode Island.....	42,006	-21	0.0	43,417	-72	-0.2
Vermont.....	28,189	-155	-0.5	28,943	-192	-0.7
<b>Mideast</b> .....	<b>2,088,043</b>	<b>-3,819</b>	<b>-0.2</b>	<b>2,157,072</b>	<b>-3,521</b>	<b>-0.2</b>
Delaware.....	38,070	-287	-0.7	39,540	-281	-0.7
District of Columbia.....	35,188	-17	0.0	37,038	7	0.0
Maryland.....	249,971	244	0.1	259,192	900	0.3
New Jersey.....	410,281	-254	-0.1	423,738	354	0.1
New York.....	862,381	-2,753	-0.3	890,668	-5,660	-0.6
Pennsylvania.....	492,153	-751	-0.2	506,895	1,158	0.2
<b>Great Lakes</b> .....	<b>1,702,864</b>	<b>1,256</b>	<b>0.1</b>	<b>1,759,587</b>	<b>7,015</b>	<b>0.4</b>
Illinois.....	497,767	-151	0.0	515,714	3,062	0.6
Indiana.....	221,606	1,243	0.6	228,136	2,392	1.1
Michigan.....	361,950	-113	0.0	375,418	547	0.1
Ohio.....	411,021	-507	-0.1	423,388	-93	0.0
Wisconsin.....	210,521	785	0.4	216,932	1,108	0.5
<b>Plains</b> .....	<b>782,749</b>	<b>926</b>	<b>0.1</b>	<b>809,220</b>	<b>5,589</b>	<b>0.7</b>
Iowa.....	109,535	455	0.4	112,560	1,271	1.1
Kansas.....	98,871	198	0.2	101,748	294	0.3
Minnesota.....	222,726	-267	-0.1	231,852	1,056	0.5
Missouri.....	214,903	312	0.1	222,193	2,035	0.9
Nebraska.....	69,145	162	0.2	71,447	449	0.6
North Dakota.....	35,631	79	0.2	36,469	231	0.6
South Dakota.....	31,939	-12	0.0	32,951	253	0.8
<b>Southeast</b> .....	<b>2,719,103</b>	<b>1,110</b>	<b>0.0</b>	<b>2,832,739</b>	<b>18,585</b>	<b>0.7</b>
Alabama.....	144,674	-24	0.0	148,418	397	0.3
Arkansas.....	87,122	174	0.2	89,488	751	0.8
Florida.....	717,453	2,661	0.4	761,153	10,539	1.4
Georgia.....	329,721	656	0.2	342,419	1,677	0.5
Kentucky.....	137,514	-15	0.0	142,347	1,061	0.8
Louisiana.....	151,372	-1,127	-0.7	156,028	-1,004	-0.6
Mississippi.....	85,967	-169	-0.2	87,907	131	0.1
North Carolina.....	316,051	317	0.1	328,556	2,105	0.6
South Carolina.....	152,175	54	0.0	157,909	1,041	0.7
Tennessee.....	210,497	-396	-0.2	219,025	776	0.4
Virginia.....	326,686	-881	-0.3	337,980	987	0.3
West Virginia.....	59,871	-141	-0.2	61,509	125	0.2
<b>Southwest</b> .....	<b>1,356,677</b>	<b>-2,084</b>	<b>-0.2</b>	<b>1,409,753</b>	<b>2,310</b>	<b>0.2</b>
Arizona.....	223,743	-1,029	-0.5	231,267	-1,344	-0.6
New Mexico.....	70,486	105	0.1	72,222	198	0.3
Oklahoma.....	124,226	403	0.3	127,043	308	0.2
Texas.....	938,221	-1,563	-0.2	979,221	3,148	0.3
<b>Rocky Mountain</b> .....	<b>421,095</b>	<b>235</b>	<b>0.1</b>	<b>443,545</b>	<b>4,077</b>	<b>0.9</b>
Colorado.....	212,078	716	0.3	224,234	2,528	1.1
Idaho.....	51,407	-56	-0.1	53,898	558	1.0
Montana.....	39,384	-93	-0.2	41,259	226	0.6
Utah.....	95,318	-250	-0.3	100,872	828	0.8
Wyoming.....	22,909	-82	-0.4	23,281	-64	-0.3
<b>Far West</b> .....	<b>2,112,920</b>	<b>4,163</b>	<b>0.2</b>	<b>2,217,369</b>	<b>13,963</b>	<b>0.6</b>
Alaska.....	34,819	154	0.4	35,926	-14	0.0
California.....	1,491,076	3,145	0.2	1,565,046	10,165	0.7
Hawaii.....	58,878	0	0.0	61,317	69	0.1
Nevada.....	97,135	-112	-0.1	101,511	460	0.5
Oregon.....	147,209	925	0.6	155,435	1,948	1.3
Washington.....	283,804	51	0.0	298,135	1,336	0.4

1. The U.S. values reported differ from the national income and product accounts (NIPA) values because PCE by state estimates exclude net expenditures abroad by U.S. residents. The expenditures of U.S.

personnel stationed abroad within this category are not included in PCE by state.  
2. Revision is a percentage of the previously published statistic.



## Personal Consumption Expenditures (PCE) by State

### Concepts and definitions

PCE by state is the regional counterpart of national PCE, which measures the value of the goods and services purchased by, and on behalf of, households. PCE by state measures household consumption based on households' state of residence in the 50 states and the District of Columbia. Examples of purchases made on behalf of households include health care services paid for by Medicare and Medicaid and education services provided by nonprofit institutions or the government.

In addition to out-of-pocket household purchases and purchases made by third parties on behalf of households, PCE by state also includes imputations for the consumption of goods and services without market transactions. The two main imputations in PCE by state are owner-occupied housing and financial services with no explicit charge.

The housing imputation approximates the value of housing services provided by owner-occupied housing. This imputation ensures that the treatment of owner-occupied housing is comparable with that of tenant-occupied housing, which is valued by rent paid. Because homeowners consume the service of shelter whether or not they owe a mortgage, this imputation represents the rent that homeowners would pay if they rented the home that they own.

The financial services imputation approximates the value of financial services that households receive either without payment or for a small fee, which does not reflect the full value of the service. Examples of these services include no-additional-fee checking accounts, record keeping, and safekeeping of deposits.

Finally, PCE by state includes the net expenditures of nonprofit institutions serving households (NPISHs). Since the services by NPISHs are typically provided to households for less than the cost of the service, these net expenditures represent the value of the services that is unaccounted for by households' out-of-pocket purchases.<sup>1</sup>

PCE by state statistics are consistent with BEA's national PCE statistics with respect to concepts and definitions and with BEA's regional income statistics with respect to residency. The latter allows for meaningful comparisons of household income and consumption within a given geography.

There are minor differences in coverage between the regional and national PCE statistics, which stem from differences in residency definitions across these statistics.<sup>2</sup> PCE by state excludes the net expenditures abroad by U.S. residents, which consist of government and private employees' expenditures abroad less personal remittances in kind to nonresidents.<sup>3</sup> These expenditures are included in national PCE, but they cannot be

attributed to a particular state. However, PCE by state does include the travel expenditures abroad by U.S. residents.

### Residency Adjustments

Residency definitions are important to the regional economic accounts to align measures of income and consumption within a given geography. PCE by state statistics use the residency concept of regional income statistics so state expenditures correspond to the same population used to measure state personal income.

For regional income statistics, a resident is considered to be a participant in a regional economy regardless of national allegiance or duration of residence. Regional income statistics exclude the income earned by U.S. residents living abroad but include the income earned by foreign nationals working in the United States. PCE by state also excludes net expenditures of U.S. residents abroad. PCE by state, however, does include the travel expenditures abroad by U.S. residents.

Residency adjustments are made to both regional income and PCE statistics; however, these adjustments serve different purposes. For regional income statistics, a residence adjustment is made to reallocate income earned in places of work other than the recipients' place of residence. For the PCE by state statistics, a residency adjustment is made to reallocate expenditures made in states other than the households' state of residence.

The PCE by state statistics based on the Economic Census data need to be adjusted to reflect spending by place of residence because the census data are collected based on point of sale. Travel, tourism, and differences in sales taxes in neighboring states are examples of why consumers make purchases outside of their home state. For instance, many New York City residents often defer gasoline purchases to coincide with trips to New Jersey because New Jersey has lower taxes on gasoline making it considerably cheaper than in New York.

The residency adjustments are based on comparisons of the estimates with independent data sources related to state-level household spending. These sources include state population, state disposable personal income, and consumer expenditure survey-based data from the Bureau of Labor Statistics.<sup>4</sup> Residency adjustments are made with category-specific, state-level ratios of survey-based household expenditures to the expenditures derived from the Economic Census receipts.

The estimated expenditures are adjusted when nonresident spending is present. Residency adjustments are applied mainly to travel-related and tourism-related categories and states. Examples of these are transportation services, recreation services, and tourist destination states, such as Hawaii, Nevada, Florida, New York, and the District of Columbia.

1. For more information, see "Chapter 5. Personal Consumption Expenditures" in *Concepts and Methods of the U.S. National Income and Product Accounts* (Washington, DC: BEA, February 2014).

2. For a more detailed discussion on residency in the national and regional economic accounts, see Christian Awuku-Budu, Ledia Guci, Christopher A. Lucas, and Charles Ian Mead, "Prototype Personal Consumption Expenditures by State," *SURVEY OF CURRENT BUSINESS* 94 (September 2014).

3. In 2016, the net expenditures abroad by U.S. residents were less than 0.04 percent of national total PCE.

4. The consumer expenditure survey-based data are expenditure weights created as part of BEA's regional price parities; for details, see Bettina H. Aten, Eric B. Figueroa, and Troy M. Martin, "Real Personal Income and Regional Price Parities for States and Metropolitan Areas, 2007–2011," *SURVEY OF CURRENT BUSINESS* 93 (August 2013).