

BEA BRIEFING

A First Look at Experimental Personal Consumption Expenditures by State

By Christian Awuku-Budu, Ledia Guci, Christopher A. Lucas, and Carol A. Robbins

THE VARYING economic experiences across the states during the downturn that began in December 2007 and ended in June 2009 emphasized the importance of regional statistics. Gross domestic product (GDP) statistics by state, and personal income statistics by state have long provided important information on the value of final goods and services produced by industries and on the incomes earned by households. However, corresponding information on household sector consumption at the state level has not traditionally been available.

Such information would be useful, as it would provide a clearer indication of how households in various regions fare in recessions and recoveries. Such statistics would yield insights on many questions, such as what categories of consumption decline the most in specific states and how the growth rates of consumer spending compare with the growth rates of disposal personal income.

The Bureau of Economic Analysis (BEA) has been exploring the possibility of producing statistics on personal consumption expenditures (PCE) at the state level to address this data gap for several years, and it is now in position to begin producing these statistics on an annual basis. BEA plans to release its first set of prototype statistics in 2014.

These experimental PCE-by-state statistics are designed to be used in conjunction with other macroeconomic and regional data produced by BEA. Given the limited availability of source data at the regional level, the new PCE-by-state statistics will not provide the same level of category detail that BEA currently makes available at the national level. The 16 categories prepared for these statistics correspond to the categories in table 2.3.5 in the national income and product accounts.

In addition, the new statistics will not initially account for the differences in prices of goods and ser-

vices across regions or over time. Nevertheless, these statistics will provide several benefits. They can be used by state governments to analyze the potential revenue impact generated from various sales tax proposals. They can be used for cross-state comparison of the impact of fiscal policy choices on household spending. They can be used to improve the regional input-output models developed by regional economists in state governments and academia. They can be used to assess purchasing power potential for marketing. Finally, the new statistics can be used to provide an indication of the general well-being of households in a state economy.

This “BEA Briefing” provides a first look at the most recent experimental PCE-by-state statistics, providing an overview of the methodology and discussing the initial results. It also discusses BEA’s long-term plans to continue to develop and improve these statistics.

The methodology is relatively simple, utilizing either state-level expenditure and receipt data or price and quantity data whenever these state-level data are available. For years when these data are not available, wage and salary data for the industries that provide the goods and services are used for interpolation and extrapolation. The experimental statistics are evaluated for consistency with state-level disposable personal income, population, and out-of-pocket household spending. Evaluation of the extrapolated results suggests that the methodology produces estimates that are close to the benchmark values for years when the primary source data are not yet available.

A BEA working paper that provides a more complete description of the methodology used to create these statistics was released earlier this year.¹ BEA plans to continue to update potential users on the develop-

1. Christian Awuku-Budu, Ledia Guci, Christopher Lucas, and Carol Robbins, “Experimental PCE-by-State Statistics,” BEA working paper WP2013-6 (Washington, DC: BEA, June 2013); www.bea.gov.

ment of these statistics. The aim of these efforts is to solicit feedback on how the current methodology might be improved before the new statistics become an official product of the Bureau.

Methodology

Consistency with BEA statistics

PCE by state measures spending on goods and services by, and on behalf of, resident households in each of the 50 states and the District of Columbia. Like PCE in the national income and product accounts (NIPAs), PCE by state excludes residential fixed investment but includes the net expenditures by resident nonprofit institutions serving households (see the box “How Do Personal Consumption Expenditures Differ From Out-of-Pocket Spending?”).

The experimental PCE-by-state statistics are con-

structed to be consistent with BEA’s national PCE statistics with respect to category definitions and to be consistent with BEA’s regional income statistics with respect to residency. Consistency with the residency concepts of BEA’s state personal income statistics allows household income and consumption to be accurately compared within the same geographic boundaries.

The same data sources that are used for the national statistics are also used for the state statistics whenever possible. However, some of the data sources do not provide complete coverage at the state level, so the estimates are scaled to sum to the category totals presented in the NIPAs. This practice of rescaling to match a national statistic is consistent with what is done for many other BEA regional statistics, such as the statistics on GDP by state and GDP by metropolitan area,

How Do Personal Consumption Expenditures Differ From Out-of-Pocket Spending?

Personal consumption expenditures (PCE) measures spending by the personal sector of the economy, which consists of households and nonprofit institutions serving households (NPISHs). A large part of PCE consists of out-of-pocket purchases of services and new goods from businesses, governments and government enterprises, and NPISHs. However, PCE is distinct from out-of-pocket household spending in a number of important ways.

Because it aims to measure the spending of the personal sector of the economy without duplication, only the net purchases of used goods from governments and businesses are included in PCE. The net purchase is the difference between receipts and expenses for the used goods. Purchases between households, such as purchases from yard sales and Craigslist, are excluded because they are transactions within the personal sector.

Some household purchases are made from governments and NPISHs for things like education and health care, where the price that households pay is less than the cost of delivering those services. How is the remainder of those costs accounted for in final demand? Again, only their net expenditures are included in PCE to avoid duplication in the measurement of spending. Thus the costs incurred by the NPISHs less sales by NPISHs to households are accounted for as a separate component of PCE, the net expenditures of NPISHs. When similar services are provided by the government sector in exchange for a fee, the costs that are not paid for by households are accounted for in the national economic accounts as government expenditures.

In addition to these out-of-pocket expenditures, PCE also includes spending on behalf of resident households and imputations for consumption without direct market transactions. When governments and employers provide the payments for the services that households purchase, but not the services directly, these services are also part of PCE. For example, PCE includes expenditures for health care that are paid for by Medicare, Medicaid, and employer provided insurance. When governments provide services directly, such as through elementary and secondary schools or through veterans hospitals, these expenditures are not treated as part of PCE but are treated as part of government output.

An important component of PCE is the value of housing services that home-owners consume. Because home-owners consume these services whether or not they owe a mortgage, PCE includes an imputed measure that represents the rent that homeowners would pay if they rented the home that they own. PCE also includes the financial services that households receive without direct payment, such as no-additional-fee checking accounts, use of automated teller machines, record keeping, and the safekeeping of deposits.

Finally, PCE excludes purchases of illegal goods and services, because these are not part of measured economic output. When combined with investment, government expenditures, and net exports, PCE provides a complete picture of the final uses of economic output. For more information on the construction of PCE in the NIPAs, see “Chapter 5: Personal Consumption Expenditures” in *Concepts and Methods of the U.S. National Income and Product Accounts* at www.bea.gov.

which are released by BEA each year.

The experimental PCE-by-state statistics use the same category definitions as those in the NIPAs, but the differences in residency lead to some differences between state statistics and national statistics. At the national level, PCE covers activities that are attributable to U.S. residents even when that activity takes place outside of the United States.² National PCE includes expenditures of U.S. government civilian and military personnel stationed abroad, regardless of the length of their assignment.

In contrast, because the PCE-by-state statistics are designed to correspond to the same population used to measure state disposable personal income, PCE by state excludes the spending of U.S. personnel stationed abroad.³ Thus, the sum of all consumer spending in the states and the District of Columbia is smaller than the national total spending by the amount of net expenditures of U.S. residents abroad, which is reported in the NIPAs in other nondurable goods. PCE by state does include travel expenditures abroad by U.S. residents, which are presented as part of services.

Source data and main steps

The experimental PCE-by-state statistics are created with a relatively simple methodology and evaluation procedure that is based on detailed state-level source data. The methodology has three main steps:

- Use state-level data to create an initial set of annual nominal expenditure estimates for detailed categories.
- Scale the initial estimates for each detailed category across states to match the national PCE categories and aggregate the expenditures to the 16 categories presented in the experimental PCE-by-state statistics.
- Adjust estimated expenditures with household survey-based data when evaluation indicates out-of-

2. In the NIPAs, PCE includes expenditures by persons physically located in the United States who have resided, or expect to reside, in the country for 1 year or more. It also includes the purchases by U.S. government personnel stationed abroad, and by U.S. residents who are traveling or working abroad for 1 year or less (Bureau of Economic Analysis, "Personal Consumption Expenditures," in *Concepts and Methods of the U.S. National Income and Product Accounts*, October 2009, page 5–2).

3. For state and county personal income statistics, BEA considers a resident to be a participant in a U.S. regional economy regardless of national allegiance or duration of residence. A residence adjustment reallocates income earned in places of work other than the recipient's place of residence. In practice, state and county personal income excludes the income earned by U.S. residents living abroad but includes the income earned by foreign nationals working in the United States (Bureau of Economic Analysis, *State Personal Income and Employment Methodology*, September 2011).

state spending is present.

The data and methods used for the annual estimates and the residency adjustment are described below. A more detailed explanation is available in a working paper on BEA's [Web site](#).

Annual estimates

Three methods are used to prepare the initial set of annual estimates; the method used depends on the data that are available for each spending category. For example, expenditures on housing and utilities—the largest expenditure category of state PCE (18.0 percent in 2011)—use price and quantity data for the tenant-occupied housing and utilities components and use state personal income for the owner-occupied housing component. Expenditures on health care services—the second largest category of state PCE (16.3 percent in 2011)—use annual expenditure data. Expenditures on goods and some of the services use economic census receipts. The three methods, price times quantity, personal income, and expenditures or receipts, are described in greater detail below.

Price times quantity. This method is used for expenditures on tenant-occupied housing, utilities, and higher education. For tenant-occupied housing, housing stock and rent data available from the Decennial Census for the years 1990 and 2000 are used for quantity and price. For 2005–2007, data from the American Community Survey (ACS) are used. For other years, state population growth is used to interpolate and extrapolate expenditures to complete the series.

For utilities, three main annual data sources are used: state-level household water usage data from the U.S. Geological Survey, regional water price data from the National Association of Clean Water Agencies, and state-level household usage and price data on electricity and natural gas from the Energy Information Agency. For higher education, enrollment and average state tuition data from the National Center for Education Statistics are used.

Personal income. This method is used for owner-occupied housing and for financial services and insurance. Owner-occupied housing, which is one of the largest spending subcategories, is the expenditure that a homeowner would make if they rented the home instead of owning it. The source data for this subcategory are the BEA's Regional Income Division measure of the net rental income that a homeowner would receive if they rented the home instead of owning it. The data source for this net rental income estimate is state-level

Decennial Census and ACS data on the value of owner-occupied housing.⁴ For the financial services and insurance category of PCE, disposable personal income by state is used as an indicator to allocate the corresponding national expenditures to states.

Receipts and expenditures. This method is used for most categories of goods and for many services. For health care services, many categories of spending correspond directly to the categories of spending tabulated by state of residence by the Center for Medicare and Medicaid Services. Data on expenditures of religious institutions are drawn from the National Center for Charitable Statistics. While these sources provide annual data, wage and salary data are used to extrapolate recent years when the source data are not yet available.

For many categories of goods and services, state-level economic census data are used to provide benchmark estimates for 1997, 2002, and 2007. For goods, the methodology uses receipts from the Census of Retail Trade that are based on the state in which the retailer is located. Industry receipts from the Census of Services are used for many services categories. For both goods and services, class-of-customer data are used to exclude the purchases made by businesses and government.

The use of these data to create state-level PCE statistics presents two limitations. First, they do not provide a complete time series for the PCE-by-state statistics, because the data are only available every 5 years. This limitation is overcome by using the growth rate of wages for the industries that sell the goods and services

4. The difference between PCE and net income for owner-occupied housing is that net income is the PCE expenditure less the costs of home ownership. These costs are intermediate goods and services consumed, consumption of fixed capital, property taxes, net interest paid, net transfer payments, and subsidies. The use of net income as an indicator for PCE assumes that these intermediate costs are the same share of imputed gross rental income for owner-occupied housing across states.

Acknowledgments

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in each PCE category to extrapolate and interpolate estimates for the missing years. These wage data come from BEA's regional wage and salary series and from the Bureau of Labor Statistics (BLS) Quarterly Census of Employment and Wages. A test extrapolation of expenditures based on 2002 economic census data shows that this procedure provides generally accurate results.

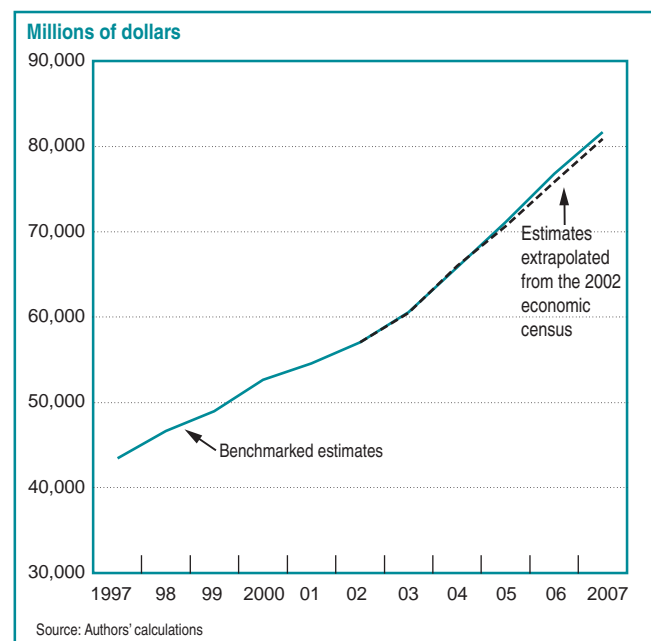
Chart 1 shows a comparison of 2007 benchmarked and extrapolated expenditures for food services and accommodations for California. The extrapolated value for 2007 is 1.0 percent below the benchmarked estimate. Although larger extrapolation errors can be expected for small states, the results suggest that the extrapolated estimates provide a reasonable approach to the missing data challenge.

A second limitation of the economic census data is that the data reflect the state where the business that provides the goods or services is located, not necessarily the state of the household where the goods or services are consumed; by definition, PCE statistics should reflect the residence of the consuming household. This limitation is overcome by the residency adjustment, which uses household-survey-based data.

Residency adjustment

Residency adjustments are based on an analysis that

Chart 1. Benchmark and Extrapolated Estimates for Food Services and Accommodations for California



compares the census-based estimates with data related to state-level household spending. For each category, the analysis is done with three ratios: a state PCE to state population ratio, a state PCE to state disposable personal income ratio, and a ratio that compares the census-based measure to a survey-based measure derived from consumer expenditure-based data from BLS.⁵

In a few cases, the analysis provides evidence that the census-based measures assign a relatively large amount of consumer spending to the state of the businesses that provide the goods or services rather than to the state of residency of consumers. In these cases, household-survey-based data are used to make a consumer residency adjustment for out-of-state spending.⁶ The main categories affected are food services and accommodations, recreation services, transportation services, other durable goods, and gasoline and other energy goods. These residency adjustments make up less than 2 percent of total PCE.

A First Look at State-Level PCE

If the PCE-by-state statistics were produced as a regular time series, they would provide a wealth of information for analysis. Three examples drawn from the experimental statistics show the kind of information and comparisons that could be made.

Total spending across states

The experimental PCE-by-state statistics show the geographic variation in total spending across states. The variation in annual nominal total PCE expenditures largely follows the geographic distribution of population. As table 1 shows for 2011, the highest estimated expenditures are for California and the lowest are for Wyoming.

The experimental PCE-by-state statistics also show substantial variation in annual percent changes. From 1997 to 2011, the states' total PCE expenditures grew at an average annual rate of 4.8 percent (table 2). However, the growth in total PCE expenditures in the Southeast, Southwest, Rocky Mountain, and Far West

5. These 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" in this issue of the SURVEY.

6. Four factors have the potential to affect the geography of consumption and influence receipts-based statistics. First, neighboring states with differing sales tax rates may lead consumers living near the border to shop in a neighboring state. Second, sparse populations or high urban rents lead consumers to travel to a neighboring state for particular products that are not available in their local area. Third, regional transportation hubs, such as regional airports, lead consumers to travel to other states for transportation services. Fourth, travel and tourism leads consumers to travel to locations with recreation or other amenities outside of their home state.

Table 1. State Total Personal Consumption Expenditures, 2011

| [Millions of dollars] | |
|--|-------------------|
| | 2011 |
| Sum of states¹ | 10,720,970 |
| New England | 606,087 |
| Connecticut | 149,799 |
| Maine | 48,161 |
| Massachusetts | 295,906 |
| New Hampshire | 50,588 |
| Rhode Island | 38,294 |
| Vermont | 23,340 |
| Mideast | 1,846,930 |
| Delaware | 33,731 |
| District of Columbia | 32,322 |
| Maryland | 226,128 |
| New Jersey | 357,393 |
| New York | 759,284 |
| Pennsylvania | 438,073 |
| Great Lakes | 1,499,084 |
| Illinois | 445,298 |
| Indiana | 201,214 |
| Michigan | 308,266 |
| Ohio | 358,501 |
| Wisconsin | 185,805 |
| Plains | 683,270 |
| Iowa | 95,521 |
| Kansas | 88,322 |
| Minnesota | 193,460 |
| Missouri | 193,565 |
| Nebraska | 59,222 |
| North Dakota | 25,438 |
| South Dakota | 27,742 |
| Southeast | 2,560,805 |
| Alabama | 135,795 |
| Arkansas | 80,010 |
| Florida | 694,560 |
| Georgia | 304,882 |
| Kentucky | 127,466 |
| Louisiana | 147,588 |
| Mississippi | 83,549 |
| North Carolina | 295,952 |
| South Carolina | 143,253 |
| Tennessee | 197,824 |
| Virginia | 292,843 |
| West Virginia | 57,085 |
| Southwest | 1,188,176 |
| Arizona | 221,613 |
| New Mexico | 65,371 |
| Oklahoma | 115,960 |
| Texas | 785,232 |
| Rocky Mountain | 366,232 |
| Colorado | 178,017 |
| Idaho | 49,238 |
| Montana | 35,433 |
| Utah | 84,094 |
| Wyoming | 19,450 |
| Far West | 1,970,386 |
| Alaska | 25,438 |
| California | 1,404,891 |
| Hawaii | 50,620 |
| Nevada | 93,350 |
| Oregon | 135,232 |
| Washington | 260,854 |

1. The PCE for the sum of states equals national PCE less net expenditures abroad by U.S. residents.

NOTE. The experimental statistics are based on the national PCE statistics from the national income and product accounts before the comprehensive revision that was released on July 31, 2013. Statistics on expenditures may not sum to the regions' PCE totals because of rounding.

Source. Authors' calculations.

Table 2. Percent Change from Preceding Period in State Total Personal Consumption Expenditures

| | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | Average 1998– 2011 |
|--|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|------------|------------|--------------------------|
| Sum of states¹ | 6.2 | 7.2 | 7.7 | 4.7 | 4.1 | 4.9 | 6.0 | 6.4 | 5.7 | 5.1 | 2.7 | -1.9 | 3.8 | 5.0 | 4.8 |
| New England | 6.1 | 7.1 | 7.0 | 6.2 | 4.6 | 5.7 | 5.5 | 4.9 | 4.1 | 4.2 | 3.2 | -1.4 | 3.6 | 4.3 | 4.7 |
| Connecticut..... | 5.6 | 6.5 | 5.0 | 5.7 | 4.7 | 4.3 | 5.5 | 5.1 | 5.0 | 4.5 | 2.7 | -1.4 | 2.4 | 4.0 | 4.3 |
| Maine..... | 6.7 | 8.1 | 6.1 | 6.9 | 6.0 | 5.4 | 6.2 | 4.6 | 5.0 | 4.7 | 3.0 | -1.5 | 3.0 | 3.8 | 4.9 |
| Massachusetts..... | 6.4 | 7.1 | 7.7 | 6.4 | 3.5 | 5.7 | 5.6 | 5.1 | 3.8 | 4.5 | 3.8 | -1.2 | 4.5 | 4.8 | 4.8 |
| New Hampshire..... | 6.4 | 8.4 | 8.1 | 6.1 | 6.5 | 7.4 | 4.6 | 4.8 | 3.2 | 2.8 | 2.6 | -1.7 | 2.3 | 4.0 | 4.7 |
| Rhode Island..... | 5.2 | 7.1 | 9.4 | 5.7 | 6.9 | 8.3 | 4.2 | 4.5 | 2.4 | 3.0 | 1.8 | -1.8 | 3.3 | 3.4 | 4.5 |
| Vermont..... | 5.5 | 7.7 | 7.9 | 7.3 | 6.4 | 5.7 | 6.5 | 4.6 | 4.1 | 4.2 | 4.6 | -1.8 | 4.5 | 3.7 | 5.1 |
| Mideast | 5.6 | 6.7 | 7.2 | 4.8 | 4.5 | 5.1 | 5.7 | 5.5 | 4.7 | 4.9 | 2.9 | -1.6 | 3.7 | 4.7 | 4.6 |
| Delaware..... | 6.9 | 8.7 | 7.6 | 6.4 | 3.4 | 6.2 | 7.0 | 6.2 | 5.6 | 4.9 | 2.8 | -0.9 | 3.4 | 5.5 | 5.3 |
| District of Columbia..... | 1.0 | 4.5 | 10.1 | 4.2 | 6.9 | 2.5 | 9.1 | 3.7 | 7.8 | 3.9 | 4.9 | -0.7 | 5.8 | 5.7 | 5.0 |
| Maryland..... | 5.9 | 7.9 | 8.1 | 6.3 | 4.7 | 5.6 | 7.0 | 6.8 | 5.3 | 4.3 | 2.2 | -1.1 | 3.0 | 4.1 | 5.0 |
| New Jersey..... | 5.8 | 5.9 | 7.1 | 5.1 | 5.3 | 5.1 | 5.2 | 4.5 | 5.2 | 4.5 | 2.1 | -2.8 | 2.9 | 3.8 | 4.3 |
| New York..... | 5.6 | 7.0 | 7.2 | 4.3 | 4.3 | 5.4 | 5.9 | 6.0 | 4.6 | 5.3 | 3.5 | -1.4 | 4.5 | 5.6 | 4.8 |
| Pennsylvania..... | 5.5 | 6.5 | 6.7 | 4.5 | 3.9 | 4.7 | 4.7 | 5.1 | 4.0 | 5.2 | 2.9 | -1.5 | 3.4 | 4.3 | 4.3 |
| Great Lakes | 5.4 | 6.5 | 7.1 | 3.8 | 2.9 | 3.6 | 4.2 | 4.3 | 3.7 | 4.3 | 2.0 | -2.8 | 2.9 | 4.9 | 3.8 |
| Illinois..... | 5.3 | 5.7 | 8.1 | 3.8 | 2.5 | 3.5 | 4.7 | 5.8 | 5.0 | 6.2 | 2.0 | -3.0 | 2.7 | 4.6 | 4.1 |
| Indiana..... | 5.8 | 7.1 | 6.9 | 4.1 | 3.4 | 3.8 | 5.1 | 4.3 | 3.9 | 4.3 | 2.7 | -1.7 | 3.3 | 5.3 | 4.2 |
| Michigan..... | 4.4 | 6.4 | 5.6 | 3.6 | 2.6 | 2.7 | 3.6 | 2.5 | 2.3 | 2.6 | 2.2 | -3.4 | 2.8 | 5.2 | 3.1 |
| Ohio..... | 5.9 | 6.4 | 7.5 | 3.5 | 3.0 | 3.7 | 3.0 | 3.7 | 2.4 | 3.6 | 1.0 | -2.7 | 2.9 | 4.8 | 3.5 |
| Wisconsin..... | 5.8 | 8.1 | 7.0 | 4.7 | 3.9 | 5.2 | 5.3 | 5.2 | 5.3 | 4.0 | 3.1 | -2.4 | 2.8 | 4.3 | 4.5 |
| Plains | 6.1 | 7.2 | 7.2 | 5.0 | 3.6 | 4.7 | 4.9 | 4.5 | 4.6 | 4.8 | 3.5 | -1.9 | 3.2 | 5.3 | 4.5 |
| Iowa..... | 5.7 | 7.2 | 6.2 | 3.1 | 2.4 | 4.0 | 5.7 | 4.8 | 5.1 | 4.3 | 3.7 | -1.8 | 3.1 | 6.6 | 4.3 |
| Kansas..... | 6.9 | 6.2 | 5.3 | 4.4 | 3.5 | 4.3 | 4.5 | 4.2 | 5.4 | 4.8 | 3.6 | -1.5 | 2.6 | 5.1 | 4.2 |
| Minnesota..... | 6.2 | 8.8 | 9.7 | 5.3 | 3.4 | 4.8 | 5.4 | 3.8 | 4.0 | 4.6 | 3.4 | -2.9 | 3.0 | 5.1 | 4.6 |
| Missouri..... | 6.1 | 6.3 | 6.4 | 5.4 | 4.2 | 4.5 | 4.2 | 4.7 | 4.4 | 4.8 | 3.5 | -1.7 | 2.8 | 4.3 | 4.3 |
| Nebraska..... | 6.0 | 7.5 | 7.2 | 6.4 | 3.0 | 5.6 | 5.0 | 5.4 | 4.7 | 4.9 | 3.3 | -1.7 | 3.6 | 4.5 | 4.7 |
| North Dakota..... | 5.2 | 4.9 | 6.2 | 5.7 | 6.0 | 5.4 | 4.3 | 4.9 | 5.6 | 6.1 | 3.0 | 1.0 | 7.3 | 11.3 | 5.5 |
| South Dakota..... | 5.2 | 7.7 | 6.2 | 5.2 | 5.2 | 6.7 | 4.8 | 4.9 | 5.4 | 5.4 | 4.4 | -0.2 | 5.4 | 6.3 | 5.2 |
| Southeast | 6.2 | 7.1 | 7.8 | 4.9 | 4.2 | 5.3 | 6.8 | 7.6 | 6.4 | 5.1 | 2.2 | -1.9 | 3.9 | 5.1 | 5.1 |
| Alabama..... | 5.0 | 6.3 | 5.6 | 5.1 | 5.1 | 4.1 | 6.0 | 6.1 | 5.3 | 4.2 | 1.9 | -2.4 | 3.6 | 3.9 | 4.3 |
| Arkansas..... | 5.5 | 7.1 | 7.9 | 5.0 | 4.1 | 5.1 | 4.1 | 6.6 | 5.4 | 5.2 | 2.6 | -1.3 | 3.2 | 5.2 | 4.7 |
| Florida..... | 6.5 | 6.0 | 8.3 | 5.8 | 5.0 | 6.2 | 8.9 | 10.9 | 8.5 | 3.5 | 1.4 | -1.9 | 3.7 | 5.7 | 5.6 |
| Georgia..... | 6.9 | 8.0 | 8.7 | 5.1 | 3.6 | 5.3 | 5.4 | 7.0 | 6.2 | 6.1 | 1.3 | -2.2 | 3.7 | 5.2 | 5.0 |
| Kentucky..... | 6.0 | 7.3 | 7.9 | 3.4 | 4.3 | 4.4 | 5.5 | 4.9 | 4.2 | 4.1 | 2.6 | -1.0 | 3.8 | 4.9 | 4.5 |
| Louisiana..... | 5.3 | 4.8 | 5.6 | 3.3 | 3.6 | 6.8 | 5.4 | 4.1 | 5.0 | 8.4 | 4.1 | -0.3 | 4.4 | 5.4 | 4.7 |
| Mississippi..... | 6.9 | 7.6 | 6.4 | 5.0 | 4.2 | 5.6 | 5.0 | 6.8 | 6.7 | 6.6 | 2.3 | -2.2 | 3.2 | 4.6 | 4.9 |
| North Carolina..... | 6.6 | 8.5 | 8.8 | 4.4 | 3.2 | 4.1 | 6.5 | 6.5 | 5.9 | 7.3 | 3.2 | -2.1 | 4.2 | 4.7 | 5.1 |
| South Carolina..... | 6.7 | 8.4 | 7.2 | 4.5 | 4.1 | 4.4 | 6.5 | 6.6 | 6.3 | 7.3 | 3.1 | -2.6 | 5.0 | 4.8 | 5.2 |
| Tennessee..... | 5.7 | 7.0 | 7.1 | 3.8 | 3.2 | 4.4 | 5.7 | 6.0 | 5.7 | 5.6 | 1.4 | -2.7 | 4.6 | 5.7 | 4.5 |
| Virginia..... | 6.4 | 8.2 | 8.5 | 5.5 | 5.4 | 6.3 | 8.0 | 8.0 | 5.6 | 3.8 | 2.9 | -2.0 | 3.6 | 4.7 | 5.3 |
| West Virginia..... | 4.6 | 5.8 | 6.8 | 6.3 | 2.7 | 3.3 | 5.7 | 4.1 | 4.5 | 4.9 | 3.8 | -0.1 | 3.8 | 5.5 | 4.4 |
| Southwest | 7.4 | 7.7 | 8.5 | 4.0 | 3.7 | 4.9 | 6.6 | 8.4 | 7.9 | 6.0 | 3.4 | -1.6 | 4.3 | 6.1 | 5.5 |
| Arizona..... | 7.8 | 8.8 | 8.6 | 5.3 | 5.8 | 6.4 | 9.2 | 12.4 | 10.9 | 5.3 | 2.4 | -2.9 | 3.3 | 5.0 | 6.3 |
| New Mexico..... | 5.1 | 6.3 | 5.4 | 6.4 | 5.8 | 5.9 | 7.1 | 8.3 | 6.2 | 7.3 | 4.6 | -1.9 | 3.0 | 4.5 | 5.3 |
| Oklahoma..... | 5.6 | 6.3 | 7.0 | 5.3 | 2.4 | 5.3 | 5.4 | 7.4 | 7.7 | 7.1 | 4.3 | -1.2 | 4.6 | 6.1 | 5.2 |
| Texas..... | 7.7 | 7.8 | 8.9 | 3.3 | 3.2 | 4.3 | 6.0 | 7.5 | 7.2 | 5.9 | 3.5 | -1.3 | 4.6 | 6.6 | 5.4 |
| Rocky Mountain | 6.8 | 8.6 | 8.8 | 5.7 | 4.2 | 3.9 | 5.1 | 6.8 | 7.6 | 6.5 | 3.4 | -1.9 | 3.3 | 5.5 | 5.3 |
| Colorado..... | 7.2 | 9.6 | 9.8 | 5.8 | 3.0 | 3.1 | 4.1 | 4.6 | 5.2 | 5.4 | 3.4 | -2.2 | 2.9 | 5.1 | 4.8 |
| Idaho..... | 6.5 | 8.3 | 9.1 | 5.2 | 5.6 | 6.3 | 6.2 | 11.7 | 10.0 | 5.5 | 2.8 | -1.8 | 4.0 | 6.2 | 6.1 |
| Montana..... | 5.4 | 7.2 | 7.6 | 6.6 | 6.2 | 5.6 | 6.8 | 8.7 | 8.5 | 7.3 | 4.9 | -1.7 | 3.4 | 5.7 | 5.9 |
| Utah..... | 6.9 | 7.3 | 7.7 | 5.4 | 4.7 | 2.9 | 7.0 | 8.6 | 11.0 | 9.2 | 2.7 | -1.4 | 4.0 | 5.8 | 5.8 |
| Wyoming..... | 6.1 | 8.3 | 5.1 | 5.8 | 9.1 | 8.4 | 2.5 | 5.1 | 9.2 | 7.0 | 6.1 | -2.5 | 2.5 | 4.4 | 5.5 |
| Far West | 7.1 | 7.8 | 8.2 | 4.5 | 4.6 | 5.3 | 7.1 | 7.7 | 6.3 | 5.3 | 2.6 | -1.8 | 4.4 | 4.6 | 5.3 |
| Alaska..... | 5.4 | 7.6 | 6.6 | 6.7 | 7.4 | 6.0 | 5.2 | 4.1 | 3.6 | 5.1 | 4.7 | -0.2 | 4.0 | 5.5 | 5.1 |
| California..... | 6.7 | 7.7 | 8.6 | 4.6 | 4.7 | 5.3 | 7.0 | 7.5 | 5.9 | 4.6 | 2.3 | -2.1 | 4.7 | 4.1 | 5.1 |
| Hawaii..... | 2.6 | 5.3 | 6.6 | 3.5 | 2.6 | 5.6 | 8.6 | 9.1 | 6.6 | 5.6 | 3.5 | -0.2 | 3.4 | 4.6 | 4.8 |
| Nevada..... | 8.2 | 10.7 | 8.7 | 7.5 | 5.1 | 8.2 | 13.8 | 12.3 | 8.7 | 6.2 | 3.0 | -3.7 | 2.7 | 5.3 | 6.9 |
| Oregon..... | 6.5 | 8.6 | 6.3 | 4.2 | 4.8 | 3.7 | 6.4 | 7.5 | 8.0 | 7.0 | 1.6 | -2.2 | 2.9 | 5.1 | 5.0 |
| Washington..... | 10.1 | 7.1 | 7.6 | 3.3 | 3.4 | 5.1 | 6.1 | 6.7 | 7.4 | 7.8 | 4.3 | -0.1 | 4.0 | 7.0 | 5.7 |

1. The PCE for the sum of states equals national PCE less net expenditures abroad by U.S. residents.

NOTE: The experimental statistics are based on the national PCE statistics from the

national income and product accounts before the comprehensive revision that was released on July 31, 2013.

Source: Authors' calculations.

regions exceeded this annual rate; the Southwest region grew at the highest annual rate of 5.5 percent. High rates of PCE growth at the state level tend to correspond to states with high rates of disposable personal income growth. From 1997 to 2011, Utah, Wyoming, Arizona, and Texas were in the top 10 states with the highest growth in both PCE and disposable personal income.

More pronounced cross-state differences in spending are observed at detailed spending categories, even across the most populous states (table 3). This table can be used to calculate budget shares by category. For example, spending on motor vehicles and parts for all states was \$374 billion out of a total of \$10.7 trillion in 2011. Thus, the average budget share of expenditures on motor vehicles and parts across all states was 3.5 percent, but it ranged from a low 2.3 percent in New York to a high of 5.1 percent in Texas. Similarly, the average budget share on housing and utilities across all states was estimated at 18.0 percent of total expenditures. These shares were 13.4 percent for Texas and 23.6 percent for California.

Per capita spending across states

The experimental PCE-by-state statistics also show substantial variation in per capita expenditures. Compared with California, New York, and Florida, Texas had the highest estimated per capita spending on motor vehicles and parts and on gasoline and other energy goods, but it had the lowest per capita spending on housing and utilities (table 4). New York had the highest estimated per capita expenditures on health care.

Expenditures on housing and utilities make up the

Table 4. Per Capita Spending on Selected Expenditure Categories for the Four Most Populous States, 2011

[Dollars]

| | Motor vehicles and parts | Housing and utilities | Health care | Gasoline and other energy goods |
|----------------------------|--------------------------|-----------------------|--------------|---------------------------------|
| United States | 1,199 | 6,194 | 5,622 | 1,375 |
| California | 985 | 8,797 | 5,694 | 1,040 |
| Texas | 1,551 | 4,101 | 4,778 | 1,471 |
| New York | 913 | 6,512 | 6,749 | 1,417 |
| Florida | 1,244 | 7,240 | 5,675 | 1,095 |

NOTE: The experimental statistics are based on the national PCE statistics from the national income and product accounts before the comprehensive revision that was released on July 31, 2013.

Source: Authors' calculations.

Table 3. State Personal Consumption Expenditures by Major Type of Product for the Four Most Populous States, 2011

[Millions of dollars]

| | Line | Sum of all states ¹ | California | New York | Texas | Florida |
|---|-----------|--------------------------------|------------------|----------------|----------------|----------------|
| Personal consumption expenditures | 1 | 10,720,970 | 1,404,891 | 759,284 | 785,232 | 694,560 |
| Goods | 2 | 3,616,748 | 401,474 | 235,508 | 298,186 | 249,132 |
| Durable goods | 3 | 1,146,422 | 135,101 | 71,557 | 101,684 | 77,857 |
| Motor vehicles and parts | 4 | 373,595 | 37,131 | 17,771 | 39,828 | 23,716 |
| Furnishings and durable household equipment | 5 | 251,703 | 29,875 | 16,980 | 19,842 | 18,207 |
| Recreational goods and vehicles | 6 | 340,117 | 43,298 | 24,599 | 26,609 | 26,473 |
| Other durable goods | 7 | 181,006 | 24,798 | 12,207 | 15,405 | 9,462 |
| Nondurable goods | 8 | 2,470,326 | 266,373 | 163,952 | 196,501 | 171,275 |
| Food and beverages purchased for off-premises consumption | 9 | 810,188 | 95,639 | 47,887 | 63,072 | 51,186 |
| Clothing and footwear | 10 | 349,183 | 45,101 | 30,078 | 29,901 | 18,135 |
| Gasoline and other energy goods | 11 | 428,303 | 39,204 | 27,584 | 37,759 | 20,868 |
| Other nondurable goods | 12 | 882,652 | 86,429 | 58,403 | 65,769 | 81,087 |
| Services | 13 | 7,104,222 | 1,003,417 | 523,776 | 487,047 | 445,428 |
| Household consumption expenditures (for services) | 14 | 6,812,279 | 962,698 | 488,889 | 473,189 | 431,625 |
| Housing and utilities | 15 | 1,929,948 | 331,569 | 126,765 | 105,284 | 137,980 |
| Health care | 16 | 1,751,619 | 214,623 | 131,371 | 122,667 | 108,148 |
| Transportation services | 17 | 302,022 | 38,064 | 21,421 | 25,827 | 17,616 |
| Recreation services | 18 | 394,534 | 51,102 | 26,444 | 29,883 | 20,986 |
| Food services and accommodations | 19 | 670,947 | 88,619 | 50,599 | 54,979 | 44,013 |
| Financial services and insurance | 20 | 807,053 | 105,272 | 57,871 | 64,271 | 49,954 |
| Other services | 21 | 956,156 | 133,449 | 74,418 | 70,278 | 52,930 |
| Final consumption expenditures of nonprofit institutions serving households (NPISHs) ² | 22 | 291,943 | 40,719 | 34,887 | 13,858 | 13,803 |
| Gross output of nonprofit institutions ³ | 23 | 1,164,469 | 132,891 | 121,481 | 58,309 | 53,801 |
| Less: Receipts from sales of goods and services by nonprofit institutions ⁴ | 24 | 872,526 | 92,172 | 86,594 | 44,451 | 39,998 |

1. The PCE for the sum of states equals national PCE less net expenditures abroad by U.S. residents, which is a component of other nondurable goods.

2. Net expenses of NPISHs are defined as their gross operating expenses less primary sales to households.

3. Gross output is net of unrelated sales, secondary sales, and sales to business, to government, and to the rest of the world; excludes own-account investment (construction and software).

4. Excludes unrelated sales, secondary sales, and sales to business, to government, and to the rest of the world; includes membership dues and fees.

NOTE: The experimental statistics are based on the national PCE statistics from the national income and product accounts before the comprehensive revision that was released on July 31, 2013. The expenditures for each category may not sum to the PCE totals because of rounding.

Source: Authors' calculations.

largest share of PCE by state. In 2011, Hawaii, California, and the District of Columbia were in the highest quintile for per capita spending on housing and utilities (chart 2). Other areas with high per capita expenditures on housing are located along the East coast and the West coast. Overall, states with high per capita spending on housing and utilities tend to correspond to those with high price levels for housing services.⁷ Low per capita expenditures on housing and utilities are estimated for the rural states of the Midwest. Based on the experimental statistics, Texas had the lowest per capita expenditures on housing and utilities of all the other states plus the District of Columbia.

Per capita spending across time

In addition to these cross-state variations in per capita spending by category, the experimental PCE-by-state statistics can also show changes over time in regional consumption on a per capita basis. For example, this information can be useful to show the impact of the recent recession on household spending.

From 2008 to 2009, total per capita expenditures declined by 2.8 percent (table 5). Some regions, however, experienced relatively larger declines. The regions with the largest declines in total per capita PCE were the Southwest and the Rocky Mountain regions (chart 3). At the state level, spending cuts in per capita total PCE ranged from 0.2 percent in North Dakota and 0.5 percent in West Virginia to 4.8 percent in Nevada and 4.9 percent in Wyoming (table 5). According to BEA's state personal income statistics, between 2008 and 2009, per capita disposable personal income also declined by the largest percentage in Wyoming (10.1 percent) and Nevada (9.0 percent).

Next Steps

As prototype estimates are developed for release in the fall of 2014, BEA is seeking comments on potential uses of the data, the methodology, and enhancements of the data set that would be most valuable to users. Comments can be addressed to Carol.Robbins@bea.gov.

Over the next year, planned areas of focus include the following: the incorporation of microdata for tenant-occupied housing and net foreign travel estimates, the development of residency-based data sources for the consumption of financial services, and the incorporation of improved statistical methods for outlier detection and interpolation into the experimental

Table 5. Percent Change from Preceding Period in Per Capita State Total Personal Consumption Expenditures, 2008–2009

| | 2009 |
|--|-------------|
| Sum of states¹ | -2.8 |
| New England | -1.8 |
| Connecticut..... | -1.8 |
| Maine..... | -1.4 |
| Massachusetts..... | -1.9 |
| New Hampshire..... | -1.7 |
| Rhode Island..... | -1.7 |
| Vermont..... | -1.9 |
| Mideast | -2.2 |
| Delaware..... | -1.7 |
| District of Columbia..... | -2.7 |
| Maryland..... | -1.9 |
| New Jersey..... | -3.3 |
| New York..... | -1.9 |
| Pennsylvania..... | -1.9 |
| Great Lakes | -2.9 |
| Illinois..... | -3.3 |
| Indiana..... | -2.3 |
| Michigan..... | -2.9 |
| Ohio..... | -2.8 |
| Wisconsin..... | -2.9 |
| Plains | -2.6 |
| Iowa..... | -2.3 |
| Kansas..... | -2.3 |
| Minnesota..... | -3.5 |
| Missouri..... | -2.3 |
| Nebraska..... | -2.6 |
| North Dakota..... | -0.2 |
| South Dakota..... | -1.2 |
| Southeast | -2.9 |
| Alabama..... | -3.2 |
| Arkansas..... | -2.0 |
| Florida..... | -2.6 |
| Georgia..... | -3.4 |
| Kentucky..... | -1.6 |
| Louisiana..... | -1.5 |
| Mississippi..... | -2.6 |
| North Carolina..... | -3.6 |
| South Carolina..... | -3.9 |
| Tennessee..... | -3.6 |
| Virginia..... | -3.2 |
| West Virginia..... | -0.5 |
| Southwest | -3.3 |
| Arizona..... | -3.8 |
| New Mexico..... | -3.1 |
| Oklahoma..... | -2.5 |
| Texas..... | -3.2 |
| Rocky Mountain | -3.6 |
| Colorado..... | -3.8 |
| Idaho..... | -3.0 |
| Montana..... | -2.4 |
| Utah..... | -3.5 |
| Wyoming..... | -4.9 |
| Far West | -2.9 |
| Alaska..... | -1.8 |
| California..... | -3.0 |
| Hawaii..... | -1.3 |
| Nevada..... | -4.8 |
| Oregon..... | -3.3 |
| Washington..... | -1.7 |

1. The PCE for the sum of states equals national PCE less net expenditures abroad by U.S. residents.

NOTE: The experimental statistics are based on the national PCE statistics from the national income and product accounts before the comprehensive revision that was released on July 31, 2013.

Source: Authors' calculations.

7. Bettina H. Aten, Eric B. Figueroa, and Troy M. Martin, "Research Spotlight: Regional Price Parities by Expenditure Class, 2005–2009," SURVEY OF CURRENT BUSINESS (May 2011): 73–87.

Chart 2. Per Capita Personal Consumption Expenditures for Housing and Utilities in U.S. Dollars, 2011

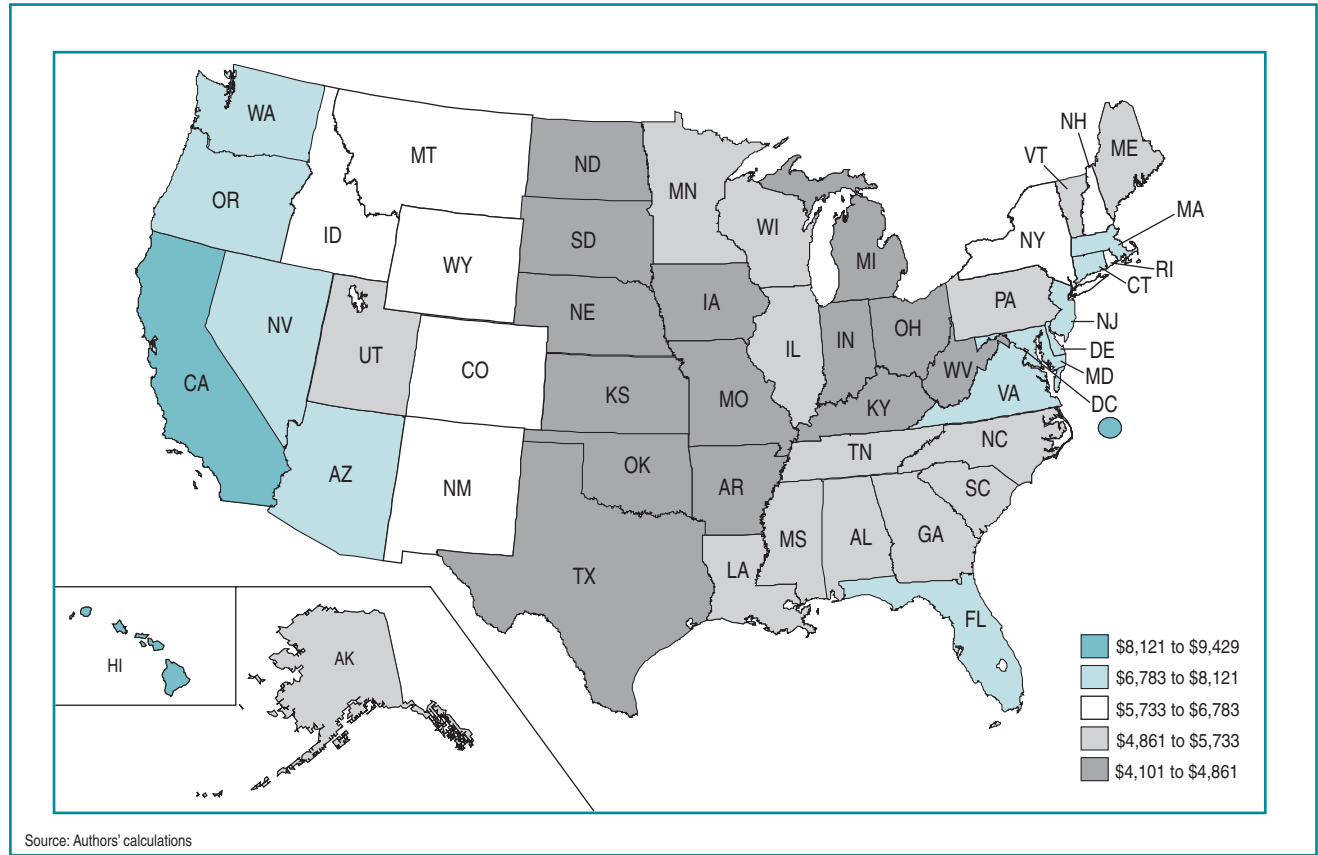
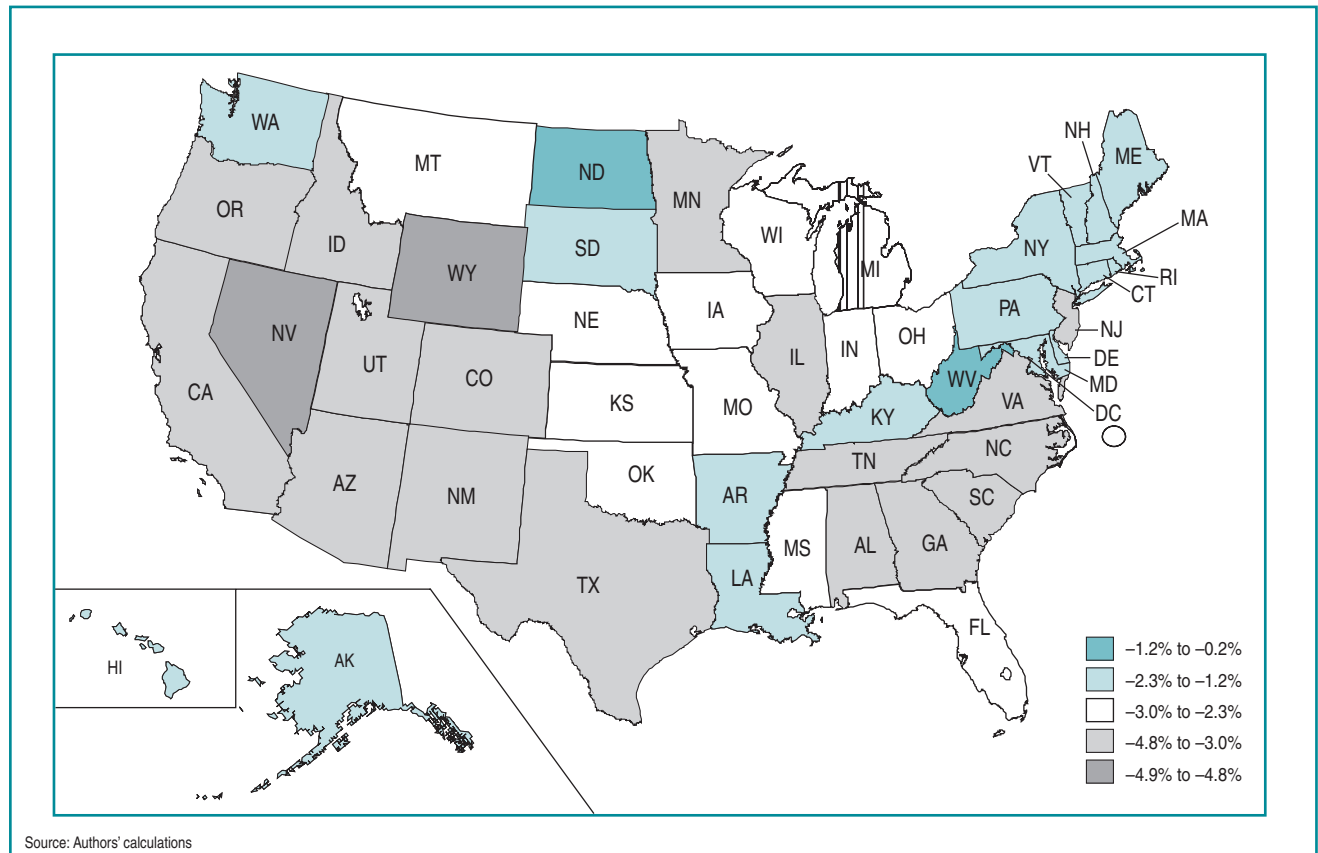


Chart 3. Percent Change in Per Capita Personal Consumption Expenditures, 2008–2009



methodology.

A longer term consideration is to increase the category detail when the underlying source data are of sufficient quality and there is sufficient interest. One area where this is feasible is in the category of health services, which has the potential to complement the ongoing work on health satellite accounts at BEA.

Another longer term consideration is the development of real PCE-by-state measures that account for differences in prices both across states and over time. This development would allow for comparisons in real spending by category and provide a measure of well-being based on consumption quantities. In the recent recession, real PCE-by-state statistics could show the relationship between changes in state GDP growth and changes in the real expenditures. For example, with detailed real state-level statistics, the decline in the price of gasoline could be separated from the impact on consumption quantities of gasoline.

The development of state price indexes for the PCE-

by-state statistics would draw heavily from much of the groundwork that has been completed by the development of regional price parities (RPPs) and real personal income. Real personal income statistics by state were released for the first time as prototype estimates earlier this year. This work has produced experimental RPPs for spending categories that are similar to BEA's PCE categories. However, they differ by category definition as well as by the weights assigned to the component categories. The RPP spending categories are based on weights that correspond to the out-of-pocket spending of BLS's consumer price index and its consumer expenditure survey rather than PCE definitions. In addition to creating PCE-category price indexes by state from the RPP-based data, additional state-level price indexes will also need to be developed for categories of spending that are distinct from the consumer expenditure survey, such as financial services that are provided without payment, net insurance premiums, and higher education.