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The statistics discussed in this *Regional Quarterly Report* include the following: (1) local area gross domestic product (GDP) statistics for 2018, which were released officially by the Bureau of Economic Analysis (BEA) in December for the first time, (2) local area personal income (LAPI) statistics for 2018 and updated LAPI statistics for 1998–2017, and (3) personal consumption (PCE) expenditures by state for 2018.

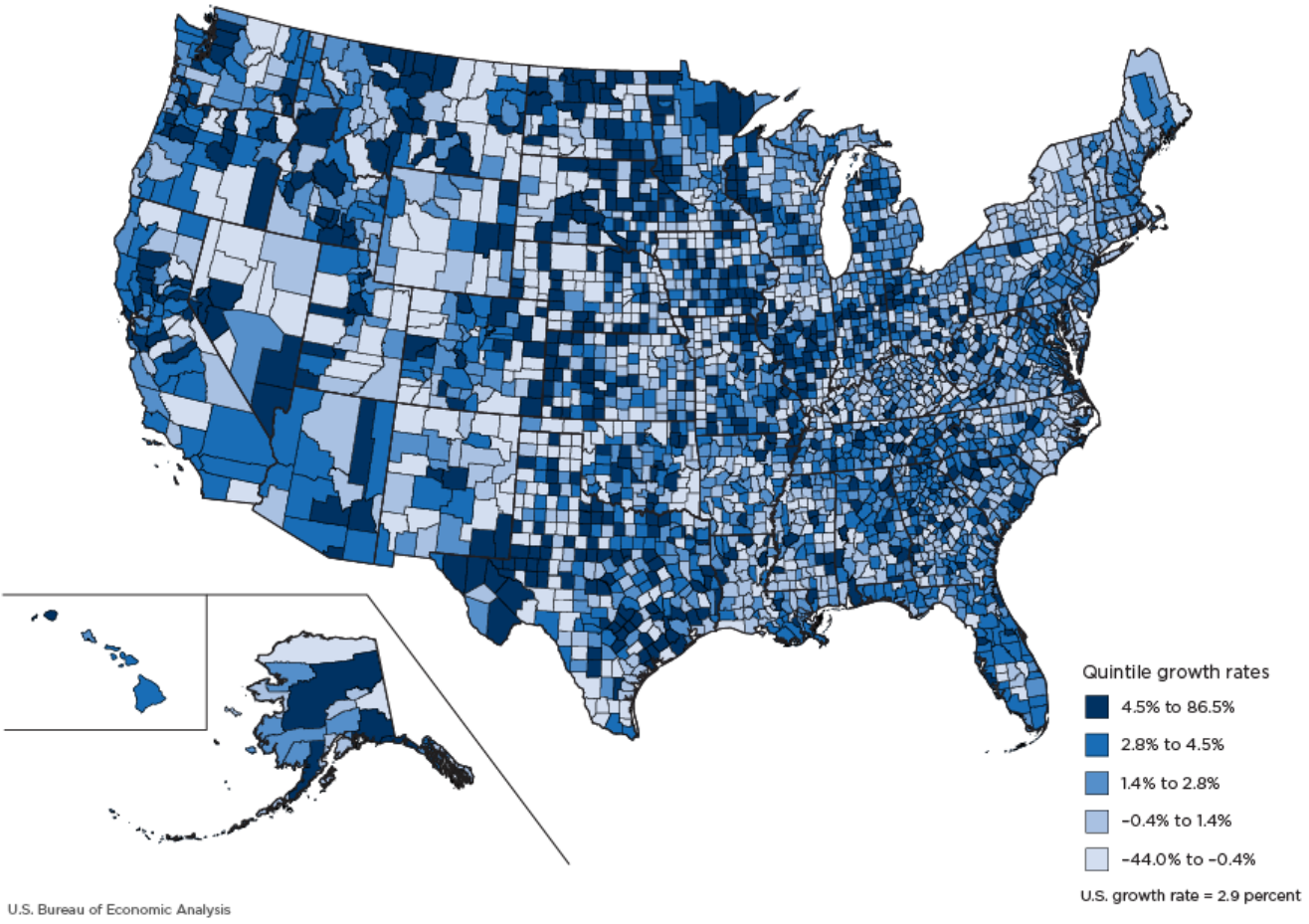
Michael Bentley, Joshua Ingber, and Nayana Kollanthara prepared the sections on local area GDP and LAPI. Terence Fallon, Joshua Ingber, Solomon Kublashvili, and Steven Zemanek prepared the section on PCE by state.

Local Area Gross Domestic Product and Local Area Personal Income, 2018

On December 12, 2019, BEA released both current- and real-dollar statistics on local area (county) GDP for 2018. This is the first official release of county-level GDP, defined as the value of goods and services produced within a county. The size of a county's economy as measured by GDP varies considerably across the United States. In 2018, the total level of real GDP ranged from $18.4 million in Issaquena County, MS, to $710.9 billion in Los Angeles County, CA.

Chart 1 illustrates the percent change in GDP by county in 2018. GDP increased in 2,375 counties, decreased in 717 counties, and was unchanged in 21 counties in 2018. The percent change in GDP ranged from 86.5 percent in Jackson County, WV, to −44.0 percent in Grant County, ND. Details about the release are available on BEA's website in the news release on county GDP estimates,[1] and a detailed methodology is set for release in the February 2020 issue of the *Survey of Current Business*.

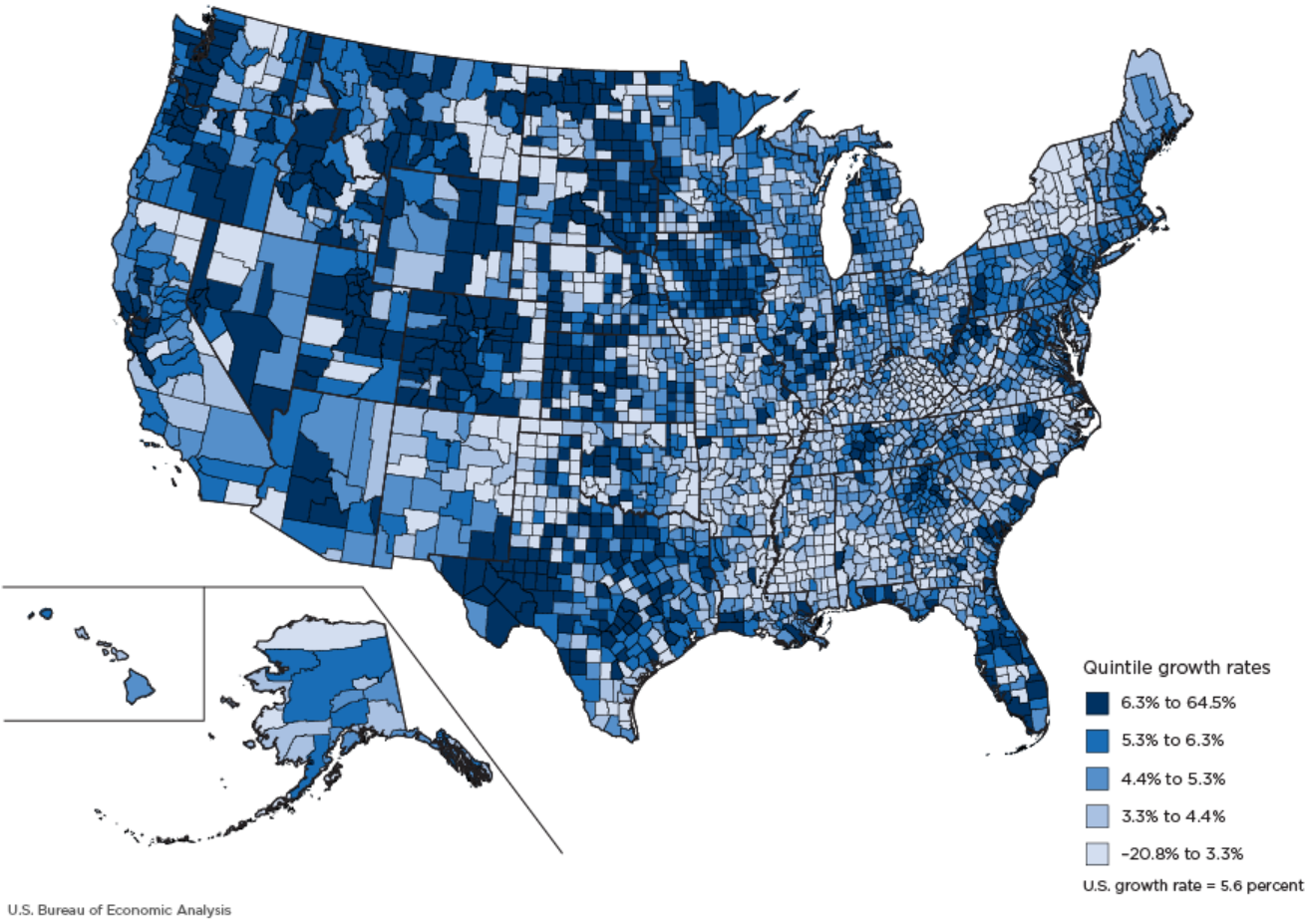
Chart 1. Percent Change in Real Gross Domestic Product by County, 2018



County-level GDP serves as an economic indicator measuring the economic vitality of local areas. However, since production is sometimes separated geographically from labor markets, it is helpful to consider another BEA indicator alongside GDP—local area personal income (LAPI). Personal income is defined as the income received by, or on behalf of, all persons from all sources—from participation as laborers in production, from owning a home or business, from the ownership of financial assets, and from government and business in the form of transfers. It includes income from domestic sources as well as from the rest of the world. For more on the methodology or definition, please see BEA's LAPI methodology paper.[2]

On November 14, 2019, BEA released current-dollar statistics on local area personal income. In 2018, total dollar levels of personal income ranged from $8.6 million in Loving County, TX, to $628.8 billion in Los Angeles County, CA. Chart 2 illustrates the percent change in personal income by county in 2018. Personal income increased in 3,019 counties, decreased in 91 counties, and was unchanged in 3 counties. The percent change in personal income ranged from −20.8 percent in Sherman County, TX, to 64.5 percent in Issaquena County, MS.

Chart 2. Percent Change in Personal Income by County, 2018



Considered together, personal income and GDP offer powerful insights into the local economy. It is possible to use both personal income and GDP as measures of recovery from the Great Recession (2008–2009), when national GDP declined, and a majority of counties experienced a decline in GDP as well.

Tables 1 and 2 describe the top 10, the median, and the bottom 10 counties by average growth rates, using a geometric mean of growth, for GDP and personal income, respectively. Karnes County, TX, leads all counties in GDP growth, increasing its productivity, on average, 46.8 percent in the decade following the recession.

Table 1. Gross Domestic Product (GDP) Growth for Selected Counties, 2009–2018

	Total GDP by county (thousands of dollars)[1]		Total GDP by county, average growth rate for 2009–2018 (percent)
	2009	2018	
Karnes, TX	418,454	13,268,891	46.8
La Salle, TX	360,216	7,785,896	40.7
Reeves, TX	657,168	12,656,413	38.9
Dimmit, TX	358,735	5,904,287	36.5
Doddridge, WV	127,267	1,354,094	30.0
McMullen, TX	369,088	3,730,348	29.3
Culberson, TX	161,776	1,599,940	29.0
Loving, TX	1,001,378	9,556,632	28.5
Glasscock, TX	584,186	5,443,954	28.1
Gonzales, TX	613,153	4,960,284	26.1
Median[2] (Motley, TX)	**37,208.61**	**41,465.80**	**1.2**
Freestone, TX	3,356,543	1,382,934	−9.4
Ohio, IN	260,487	103,661	−9.7
Knott, KY	552,407	210,606	−10.2
Johnson, WY	1,152,513	438,751	−10.2
Clay, WV	285,753	108,545	−10.2
Boone, WV	1,774,533	663,183	−10.4
Roberts, TX	2,897,356	1,015,484	−11.0
Terrell, TX	512,394	161,791	−12.0
Zapata, TX	2,604,696	819,217	−12.1
St. John the Baptist, LA	14,567,820	2,361,164	−18.3

1. Source. U.S. Bureau of Economic Analysis
2. The median county is defined as that ranked 1,557th of the 3,113 counties.

Table 2. Personal Income Growth for Selected Counties, 2009–2018

	Total personal income by county (thousands of dollars)[1]		Total personal income by county, average growth rate for 2009–2018 (percent)
	2009	2018	
Loving, TX	2,234	8,623	16.2
Glasscock, TX	39,676	141,777	15.2
McKenzie, ND	248,500	852,673	14.7
Billings, ND	23,678	68,633	12.6
Midland, TX	8,513,490	21,478,156	10.8
Wasatch, UT	732,667	1,771,209	10.3
Benton, AR	10,293,948	24,232,084	10.0
Hudspeth, TX	66,559	155,701	9.9
Sumter, FL	2,554,076	5,935,589	9.8
Karnes, TX	342,820	776,133	9.5
Median[2] (Bingham, ID)	**1,245,972**	**1,679,963**	**3.4**
Stephens, TX	409,107	370,612	−1.1
Mora, NM	178,840	160,116	−1.2
Atchison, MO	247,429	220,457	−1.3
Carroll, KY	442,783	390,274	−1.4
Hall, TX	104,027	91,385	−1.4
Throckmorton, TX	62,235	54,450	−1.5
Hancock, KY	383,395	323,423	−1.9
Slope, ND	45,714	37,750	−2.1
Ohio, IN	289,555	237,932	−2.2
Issaquena, MS	31,551	24,251	−2.9

1. Source. U.S. Bureau of Economic Analysis
2. The median county is defined as that ranked 1,557th of the 3,113 counties

However, Karnes County was ranked 10th in income growth over the period, demonstrating some key differences between the two indicators: (1) geographic location of production and income are correlated but not necessarily aligned, and (2) growth in personal income, in accord with expectations and economic theory, lags that of GDP. Charts 3 and 4 map these growth rates to consider the possibility of a regional trend in growth over the period.

Many of the fastest and slowest growing counties, for both GDP and personal income, are found in Texas. Given the diverse economic makeup in Texas, it can serve as a microcosm for describing the types of counties and industries that contributed to the recovery. Also, restricting the analysis to Texas is helpful because counties in Texas share, for the most part, state-level institutional, legal, and cultural norms. Whereas, a comparison between a Texas county and, for example, a Minnesota county do not account for differences in taxation policy, property rights, or a multitude of other explanatory factors that help to understand growth.

Chart 3. Average Gross Domestic Product Growth Rate by County, 2009–2018

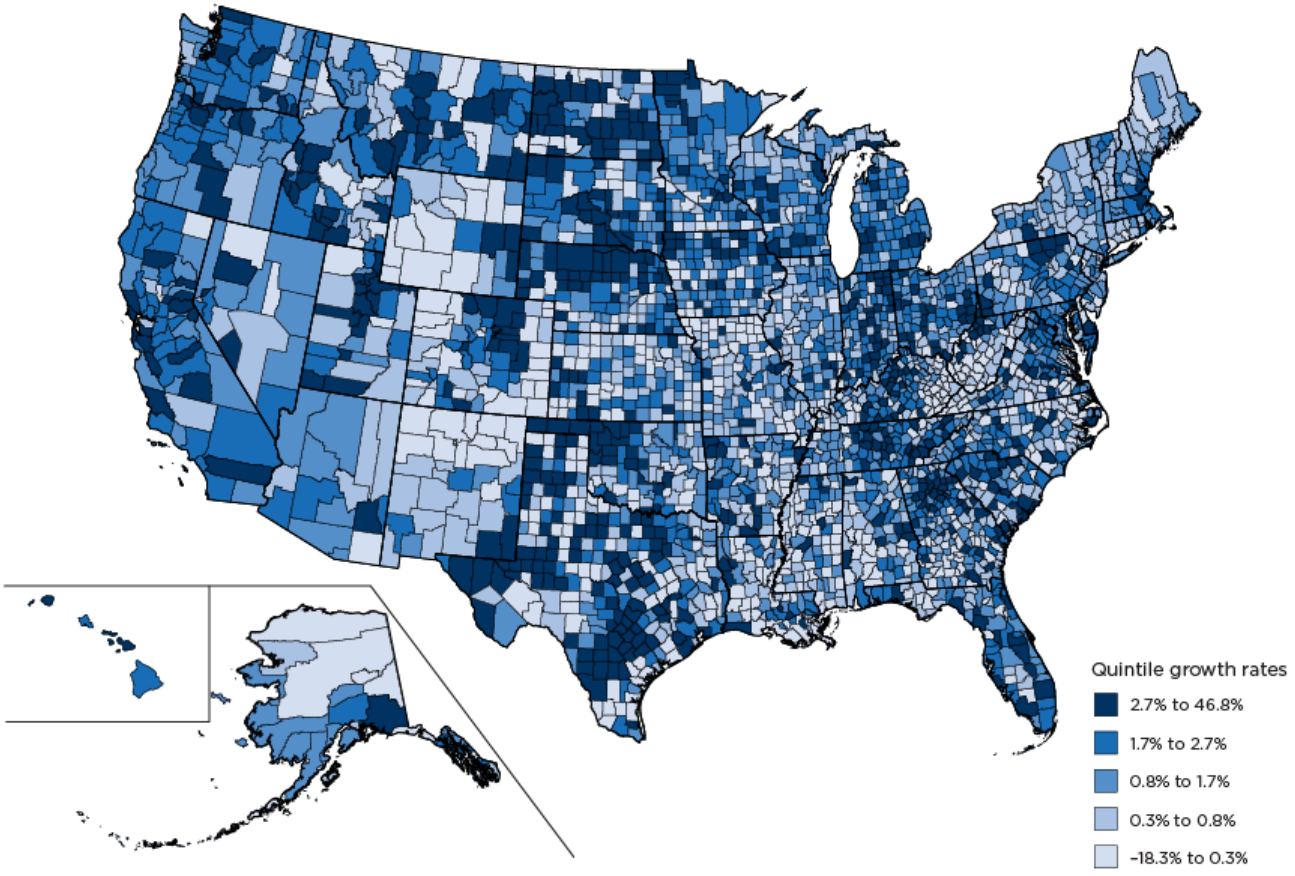


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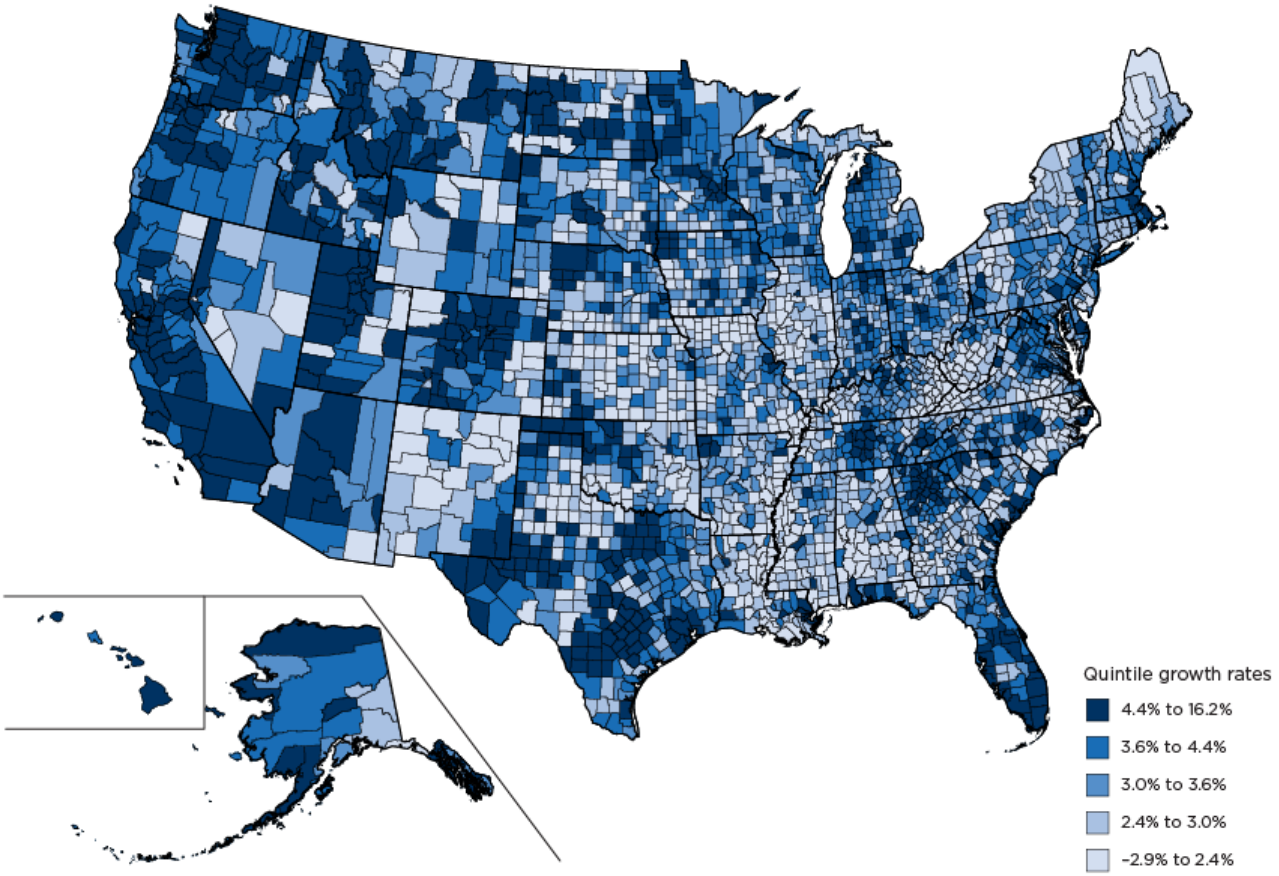
Chart 4. Average Personal Income Growth Rate by County, 2009–2018



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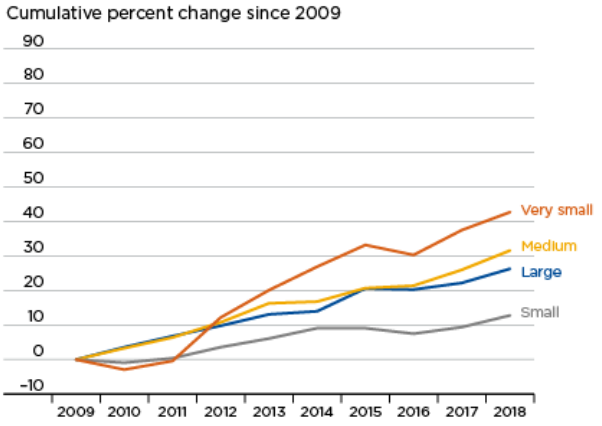
Counties bear some resemblance according to their size. Dividing Texas into counties with fewer than 5,000 nonfarm jobs ("very small"), 5,000 to 10,000 nonfarm jobs ("small") 10,000 to 50,000 nonfarm jobs ("medium"), and more than 50,000 nonfarm jobs ("large") allows for the consideration of county size as a factor for growth. Charts 5 and 6 depict percent changes in real GDP and current-dollar personal income for all counties in Texas, with 2009 as a base year.

Chart 5. Real Gross Domestic Product by County Size, 2009–2018



Note. Very small county has fewer than 5,000 nonfarm jobs; small county has 5,000-10,000 nonfarm jobs; medium county has 10,000-50,000 nonfarm jobs; and large county has more than 50,000 nonfarm jobs.

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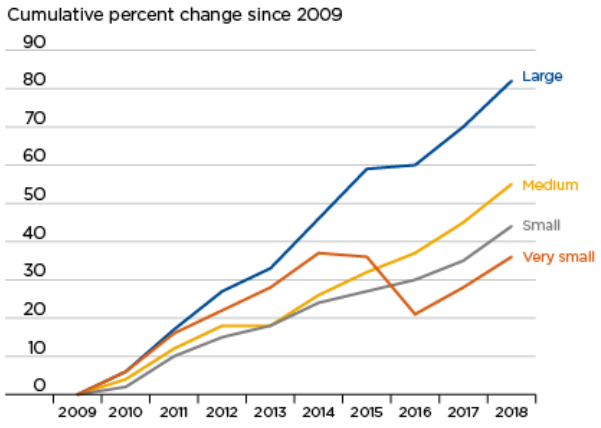
Interestingly, we see that very small Texas counties had the highest percent change in GDP over the period, 42.7 percent, despite a delayed start to the growth. Very small counties had higher rates of GDP growth than small counties (12.8 percent), medium counties (31.6 percent), and large counties (26.3 percent) over the period. On one hand, very small counties would expect larger percent changes, as a small increase in GDP magnifies the effect on calculating a percent change, when GDP is already small. However, we do not see this effect in small counties, nor is it present when looking at personal income. In addition, economic theory suggests that productivity gains occur when people specialize and trade, a feature of denser locations. Thus, despite expectation, the smallest Texas counties increased their productivity at rates higher than larger counties. Most likely, this growth can be traced to the decade's boom in mining, quarrying, and oil and gas extraction. Property rights in Texas are such that land owners can lease their land to bigger production firms, who benefit from economies of scale in the production process. Thus, small producers, who traditionally can only participate in a market when they are priced-in by high market prices for oil, gas, or mining extract, can circumvent the impact of price fluctuations by leasing out their land.

Chart 6. Personal Income by County Size, 2009–2018



Note. Very small county has fewer than 5,000 nonfarm jobs; small county has 5,000–10,000 nonfarm jobs; medium county has 10,000–50,000 nonfarm jobs; and large county has more than 50,000 nonfarm jobs.

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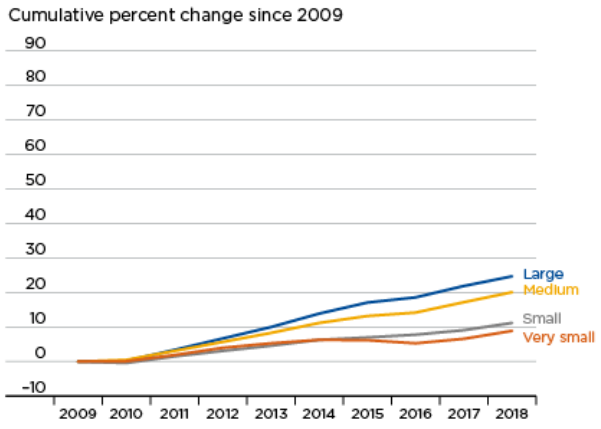
When looking at personal income, the data better conform to economic expectations. The largest counties experience an 82.3 percent increase in personal income. We see that very small counties grew significantly during the first half of the decade, almost keeping pace with their larger state counterparts. Eventually, we see an income distribution effect according to size; where medium counties grew 55.3 percent, small counties 44.0 percent, and very small counties 35.5 percent. Similarly, job growth is distributed by size as well, as seen in chart 7. Keeping the same scale across these charts reveals some indication that income is outpacing job growth.

Chart 7. Total Employment by County Size, 2009–2018



Note. Very small county has fewer than 5,000 nonfarm jobs; small county has 5,000-10,000 nonfarm jobs; medium county has 10,000–50,000 nonfarm jobs; and large county has more than 50,000 nonfarm jobs.

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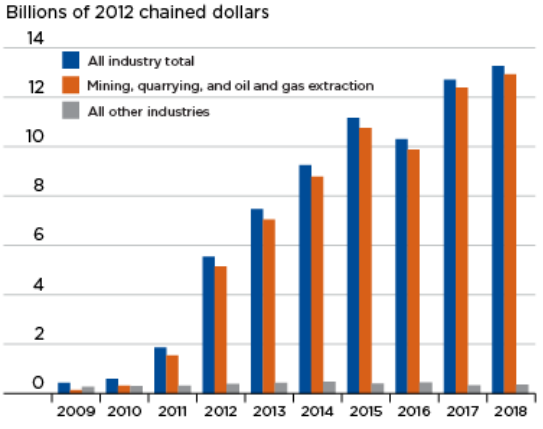
Different industries or different sources of income contribute to overall growth and provide another framework to understand the recovery period. To highlight this, consider how certain industries drove growth in GDP and different sources of income drove growth in personal income in Karnes and Zapata counties, TX. Karnes County benefitted from the fastest average GDP growth in the state, 46.8 percent. In addition, its average personal income growth was 9.6 percent. Conversely, Zapata County experienced the most dramatic average decline in GDP in the state, −12.1 percent. Despite declines in GDP, average growth in personal income in Zapata County was 2.8 percent.

Karnes County, Texas

Karnes County, a very small county, is located in the southeastern part of Texas, approximately 50 miles southeast of San Antonio, TX, and had a population of 15,650 in 2018. It sits on the Eagle Ford Shale, which ranks as one of the largest oil and gas developments in the world, based on capital investment. It has been reported that approximately $30 billion was spent developing oil and gas extraction in the Eagle Ford Shale area.

Average GDP growth in Karnes County from 2009 to 2018 was 46.8 percent. Chart 8 shows the GDP growth of all industries in Karnes County as well as the growth of the mining, quarrying, and oil and gas extraction industry. The all other industries category includes industries such as agriculture, forestry, fishing, and hunting; construction; manufacturing; wholesale and retail trade; and arts, entertainment, and recreation. As shown in chart 8, the largest contribution to overall real GDP growth in Karnes County from 2009 to 2018 can be primarily attributed to the mining, quarrying, and oil and gas extraction industry due to the Eagle Ford Shale boom in the county.

Chart 8. Real Gross Domestic Product for Mining and All Other Industries for Karnes, TX, 2009–2018



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Average personal income growth in Karnes County from 2009 to 2018 was 9.6 percent. Charts 9 and 10 show the percent contribution of the three major components of personal income in Karnes County for both 2009 and 2018. In Karnes County, dividends, interest, and rent, which includes royalties, contributed 18.5 percent in 2009 but accounted for 40.7 percent of personal income in 2018; while personal current transfer receipts and net earnings by place of residence decreased over the 10-year period. The driver of personal income growth was dividends, interest, and rent, which supports the notion that Karnes County residents leased land to firms in the mining, quarrying, and oil and gas extraction sector.

Chart 9. Percent Contribution to Personal Income for Karnes, TX, 2009

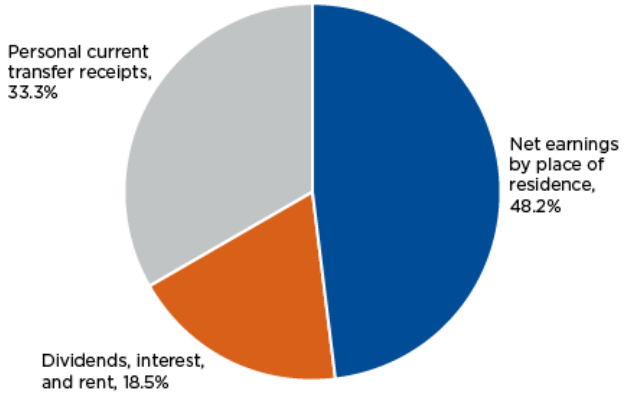

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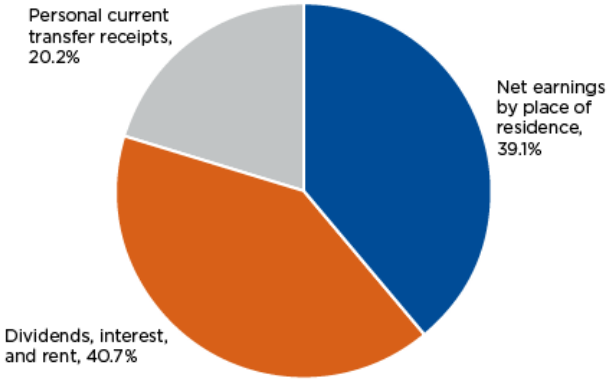
Chart 10. Percent Contribution to Personal Income for Karnes, TX, 2018



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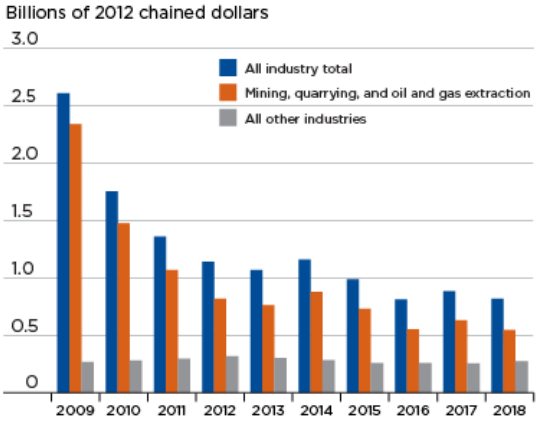
Zapata County, Texas

Average GDP declined in Zapata County from 2009 to 2018 and was –12.1 percent. Chart 11 shows the magnitude of which the mining, quarrying, and oil and gas extraction industry contributed to the overall GDP decline in Zapata County. It also shows real GDP for all other industries combined.

Zapata county, also a very small county, located in southern Texas along the U.S.-Mexico border, had a population of 14,190 in 2018. Oil was discovered in Zapata County in 1919, during the Texas oil boom of the early 20th century. Over the past 10 years Zapata County has experienced a decline in oil production as oil deposits have been depleted in the county, alternative areas of oil extraction have been developed in other parts of Texas and the country, and the price of oil has decreased to the point of making oil wells in Zapata County unprofitable. However, the mining, quarrying, and oil and gas extraction industry is still important in Zapata County, as natural gas production is significant there, accounting for approximately 0.7 percent of overall natural gas production in Texas.

Chart 11. Real Gross Domestic Product for Mining and All Other Industries for Zapata, TX, 2009–2018



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In contrast, average growth in personal income in Zapata County from 2009 to 2018 was 2.8 percent. Charts 12 and 13 show the percent contribution of the three major components of personal income in Zapata County for both 2009 and 2018. Net earnings by place of residence, income earned from labor, contributed to the growth of personal income from 2009 to 2018 in Zapata. In 2009, this component

contributed 51.5 percent to personal income; it contributed 57.1 percent in 2018. Personal current transfer receipts didn't show any significant change, while dividends, interest, and rent decreased from 17.8 percent in 2009 to 12.4 percent in 2018.

Chart 12. Percent Contribution to Personal Income for Zapata, TX, 2009

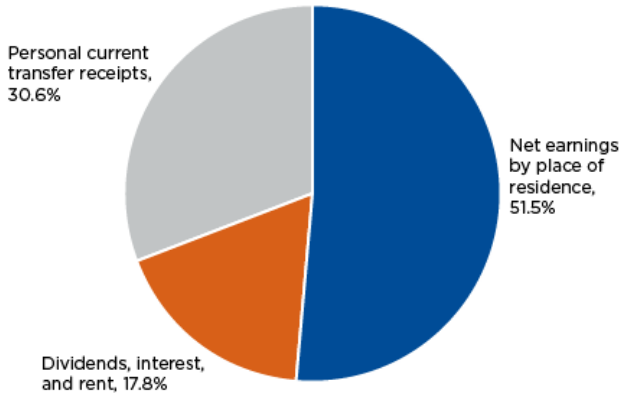

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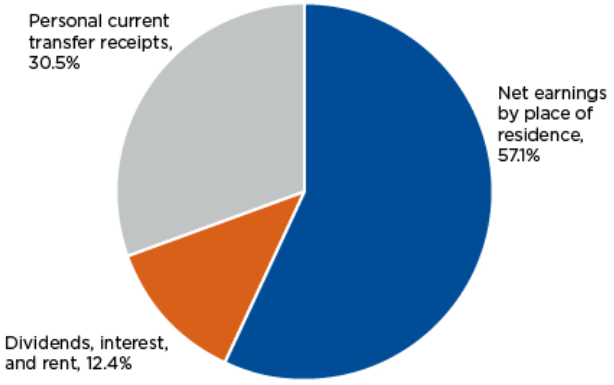
Chart 13. Percent Contribution to Personal Income for Zapata, TX, 2018



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Earnings in the mining, quarrying, and oil and gas extraction industry was the leading contributor to overall earnings growth in Zapata County, as natural gas production increased over the last 10 years. However, dividends, interest, and rents decreased most likely as royalties, a part of rents, declined because oil production has significantly decreased in the county. Oil production in Zapata County has decreased due to economic substitution, as oil production in Texas has shifted to the Eagle Ford Shale and the Permian Basin.

Methodology, source data, and revisions

GDP by county

On December 12, 2019, BEA released the first official measures of GDP by county. GDP can be measured as the sum of income payments and other costs incurred in the production of goods and services. This "income approach" to measuring GDP is conceptually equivalent to the production approach that measures gross output minus intermediate inputs and the final expenditures approach that measures the sum of personal consumption, private investment, government spending, and exports less imports. As with BEA GDP by state statistics, the county statistics employ the income approach to measuring GDP; that is, GDP is computed as the sum of compensation of employees, taxes on production and imports less subsidies, and gross operating surplus, as shown here:

$$GDP_{cnty,i} = Compensation_{cnty,i} + Taxes\ on\ Production\ and\ Imports\ less\ Subsidies_{cnty,i} + Gross\ Operating\ Surplus_{cnty,i}$$

BEA produces county-level statistics for the compensation of employees and the proprietors' income portion of gross operating surplus in its estimation of county-level personal income. By a simple rearrangement of terms, a residual component of GDP, representing the sum of (1) gross operating surplus minus proprietors' income and (2) taxes on production and imports less subsidies, can be calculated. It is this residual component of GDP that needs to be estimated to complete the measurement of GDP by county, as shown here:

$$GDP_{cnty,i} = Compensation_{cnty,i} + Proprietors'\ income_{cnty,i} + (Gross\ Operating\ Surplus\ less\ Proprietors'\ income + Taxes\ on\ Production\ and\ Imports\ less\ Subsidies)_{cnty,i}$$

GDP by county is published at the sector level, however, many industries are estimated at the three-digit North American Industry Classification System (NAICS) level. To estimate the county residual portion of GDP for each industry, BEA first calculates the state-level residual value for each industry from BEA GDP by state statistics. County-level industry source data are used as indicators to distribute the calculated state-level residual portion for each industry to produce county estimates. The resulting county statistics sum to published GDP by state by industry.

The source data fall into one of two categories—general or industry-specific. General data sources capture data on all published industries and were incorporated into the methodology for most industries, while industry-specific data sources were incorporated into one industry. Tables 3 and 4 list the two categories of data sources the industries that rely upon those data.

Table 3. Source Data

Industry	Economic Census	National Establishment Time Series	Additional sources of data used
Agriculture, forestry, fishing, and hunting[1]			✓
Mining[1]			✓
Utilities			
Construction[2]			✓
Manufacturing	✓	✓	
Wholesale trade	✓	✓	
Retail trade	✓	✓	
Transportation and warehousing[1]	✓	✓	✓
Information	✓	✓	
Finance and insurance[1]	✓	✓	✓
Real estate and rental and leasing[1]	✓	✓	✓
Professional and technical services	✓	✓	
Management of companies and enterprises			
Administrative and waste services	✓	✓	
Educational services	✓	✓	
Health care and social assistance	✓	✓	
Arts, entertainment, and recreation	✓	✓	
Accommodation and food services	✓	✓	
Other services, except government	✓	✓	
Government[1]			✓

1. Denotes additional source data in the sub-industry detail.
2. Denotes additional source data at the sector level.

Table 4. Origin of Additional Sources of Data

Industry	Additional source data
Agriculture, forestry, fishing, and hunting	
Farms	Bureau of Economic Analysis (BEA) farm receipts and expenses
Mining data	
Oil and gas extraction	Drilling Edge
Mining except oil and gas extraction	Energy Information Agency (EIA)
Construction	Dodge Analytics
Transportation and warehousing	
Air transportation	Bureau of Transportation Statistics
Rail transportation	Amtrak Surface Transportation Board
Finance and insurance	
Banking	Federal Deposit Insurance Corporation
Real estate and rental and leasing	
Real estate	BEA imputed rent, BEA rental income from farms owned by nonoperator landlords, American Housing Survey
Government	
Federal civilian	Bureau of Labor Statistics (BLS), EIA
Federal military	BLS

Chained-dollar values of GDP by county are derived by applying national chain-type price indexes to the current-dollar values of GDP by county for 65 detailed NAICS-based industries. The chain-type index formula that is used in the national accounts is then used to calculate the values of total real GDP by county and real GDP by county at more aggregated industry levels.

Because of the sensitivity of some of the source data used in estimation, the GDP by county statistics are subject to suppressions via disclosure avoidance of confidential source data. These suppressions have been applied according to the guidance accompanying any sensitive source data. A full discussion of the methodology is forthcoming in the February 2020 *Survey of Current Business*.

Local area personal income

Each November, BEA typically revises the annual local areal personal income estimates to incorporate the results of the July annual update of the National Income and Product Accounts,[3] to incorporate the results of the September annual update of state personal income,[4] and to incorporate revised source data that are more complete and more detailed than those previously available. With the November 14, 2019, release of local area personal income, the annual estimates for 1998–2017 were revised. The revisions for 1998–2013 were solely due to revisions to state estimates of personal interest income as a result from an improvement in the estimation methodology and data sources.

The main 2018 county-level data used by BEA to prepare the estimates of local area personal income presented in this article were wage and salary data from the Bureau of Labor Statistics, benefits paid by the Social Security Administration, Medicare enrollment and fee-for-service expenditure data from the Centers for Medicare and Medicaid Services, and Medicaid payments from state departments of social services. In addition, Internal Revenue Service tabulations of 2017 federal income tax returns were used, primarily for dividends, interest, nonfarm proprietors' income, and the residence adjustment.[5] Other county-level data were used to prepare estimates of various components of local area personal income, including the following (table 5):

- For local area farm income, farm cash receipts, government payments, crop production, livestock stocks, and crop insurance indemnity payments by county for 2018 from the U.S. Department of Agriculture and state offices of agricultural statistics were used.
- For military earnings, the number of full-time military and Coast Guard personnel by county for 2018 from the Departments of Defense and Homeland Security was used.

- For state unemployment insurance compensation, county-level data for 2018 from state employment security agencies were used.
- For a few small components of personal income, population (excluding population in group quarters) by county for 2018 from the Census Bureau was used to allocate state estimates to the counties.

Table 5. County Source Data Used to Estimate Local Area Personal Income[1]

Data	Source
Wages and salaries by industry	
In general	BLS Quarterly Census of Employment and Wages data
Farm	USDA Census of Agriculture data
Agriculture and forestry support activities	USDA Census of Agriculture data
Rail transportation	RRB payroll and employment data; Census Bureau Journey to Work (Census of Population) data
Educational services	Census Bureau County Business Patterns payroll data; state departments of education employment data; DOE Private School Universe Survey employment data; Official Catholic Directory number of teachers in religious orders data
Membership associations and organizations	Household population data[2]
Private households	Household population data;[2] Census Bureau Journey to Work (Census of Population) data
Military	DOD personnel data; DHS Coast Guard personnel and payroll data; household population data[2]
State and local government	Census Bureau American Community Survey wage data; RRB payroll and employment data
Employer contributions for employee pension and insurance funds by industry	
All industries	BEA estimates of wages and employment[3]
Employer contributions for government social insurance by industry	
All industries	BLS state unemployment insurance programs employer contributions data
Proprietors' income	
Farm	USDA Census of Agriculture data; USDA National Agriculture and Statistic Service crop production and livestock stocks data; cash receipts from state offices of agricultural statistics; USDA Farm Service Agency and Natural Resource Conservation Service government payments to farmers data; USDA Risk Management Agency crop indemnity payments data
Nonfarm industries	IRS data on net profits of sole proprietorships and partnerships
Residence adjustment	Census Bureau Journey to Work (American Community Survey) employment and wage data; IRS wage data
Dividends, interest, and rent	IRS income tax returns data on dividends, taxable interest, and gross rents and royalties; OPM federal civilian retirement payments data; DOD military retirement payments data; Census Bureau Census of Housing data on the aggregate gross rental value of owner-occupied single-family dwellings and number of mobile homes; USDA gross rental value of farm dwellings data
Personal current transfer receipts	SSA Social Security and Supplemental Security Income enrollees and benefits data; CMS data on the number of enrollees in the Medicare Hospital Insurance, Supplementary Medical Insurance, and Part D programs; CMS Medicare Advantage fee-for-services expenditure data; data from the Treasury Department's USASpending.gov (higher education student assistance and railroad worker retirement benefits); Census Bureau Small Area Income and Poverty Estimates (persons and children age 0–17 in poverty and number of Supplemental Nutritional Assistance Program recipients); Census Bureau American Indian and Alaska Native Alone population and household population data;[2] DOD Tricare payments data; IRS refundable income tax credit data; number of unemployed persons from the BLS Local Area Unemployment Statistics program; DVA veterans pension, disability, life insurance, and readjustment benefits data and number of pension and disability beneficiaries; NSF federal fellowship benefits data; Federal Reserve Bank of New York data on the number of mortgage debtors, per debtor mortgage debt balance and percent of mortgage debt in delinquency; Medicaid payments, Children's Health Insurance Program enrollment, Supplemental Nutritional Assistance Program benefits, energy assistance payments, general assistance benefits, and family assistance benefits data from the state departments of social services; state unemployment insurance compensation data from the state employment security agencies
Employee and self-employed contributions for government social insurance	CMS Medicare Parts B and D enrollment data; Census Bureau American Community Survey veteran population data; BEA estimates of employment

1. BEA prepares some county estimates by aggregating source data available by ZIP code.
2. Household population for counties is calculated as the difference between the Census Bureau population and the Census Bureau population in group quarters estimates.
3. See the*Local Area Personal Income Methodology* for the data sources used by BEA to estimate employment.

BEA	Bureau of Economic Analysis
BLS	Bureau of Labor Statistics
CMS	Centers for Medicare and Medicaid Services
DHS	Department of Homeland Security
DOD	Department of Defense
DOE	Department of Education
DVA	Department of Veterans Affairs
IRS	Internal Revenue Service
NSF	National Science Foundation
OPM	Office of Personnel Management
RRB	Railroad Retirement Board
SSA	Social Security Administration
USDA	U.S Department of Agriculture

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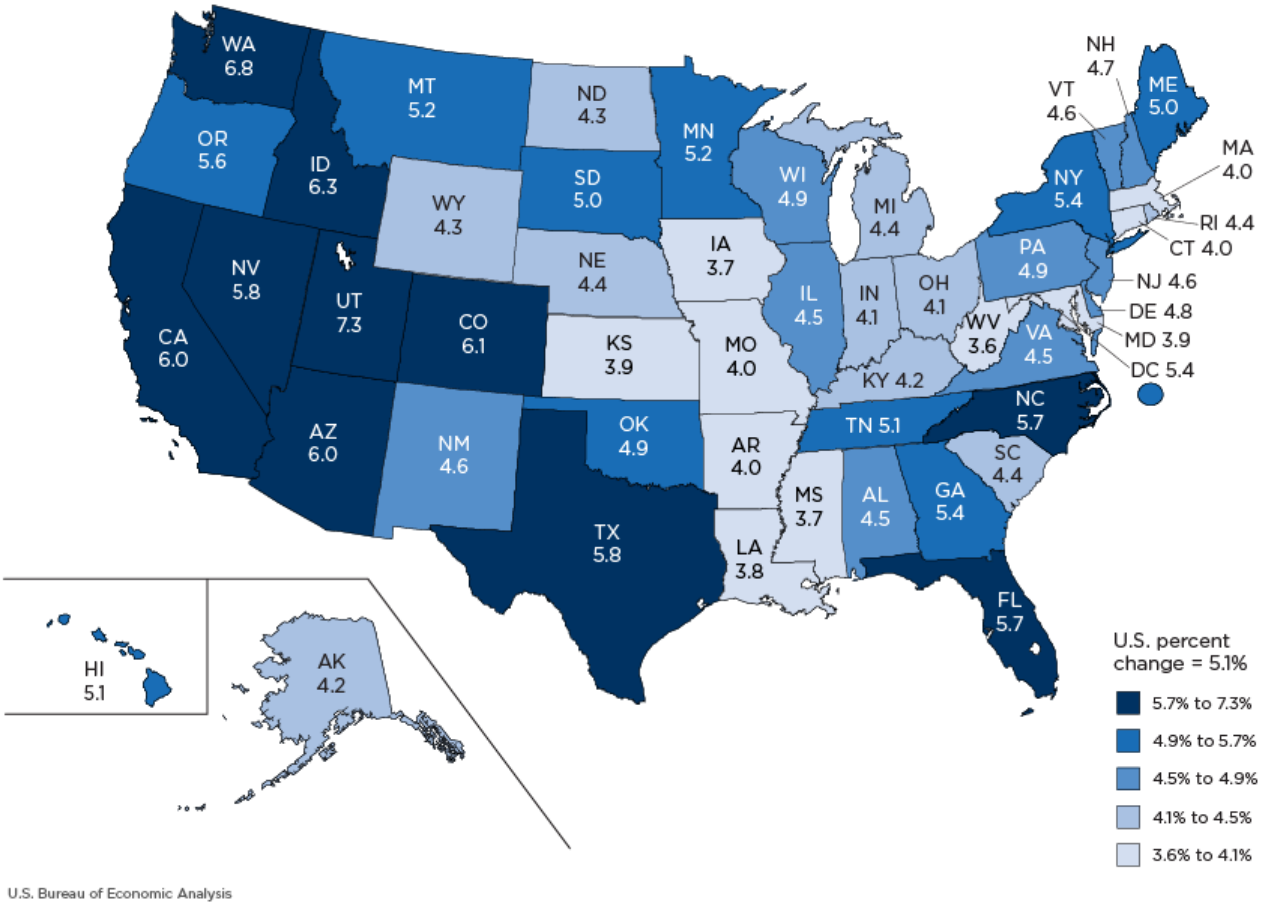
Personal Consumption Expenditures by State, 2018

On October 3, 2019, BEA released current-dollar statistics on PCE by state for 2018. PCE grew 5.1 percent nationwide in 2018, increasing in all states and the District of Columbia. The percent change for the states ranged from a high of 7.3 percent in Utah to a low of 3.6 percent in West Virginia (chart 14).

Chart 14. Percent Change in Total Personal Consumption Expenditures by State, 2017–2018



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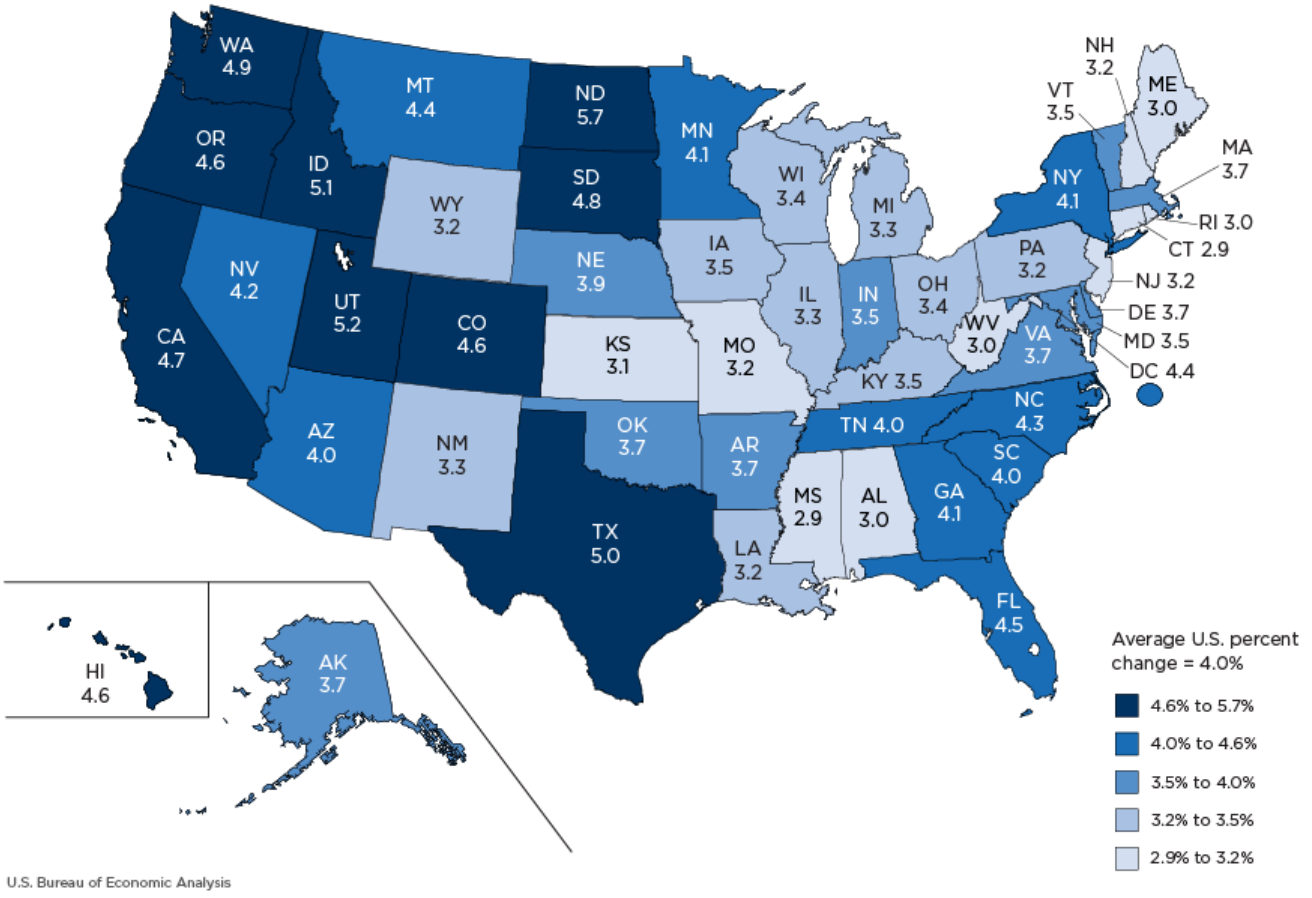
PCE by state is a household consumption measure that reflects the value of the goods and services purchased by, or on behalf of, households by state of residence. These statistics on households provide an indication of economic well-being as well as information on consumption patterns across states and over time. For example, the statistics show how households allocate their spending between goods and services or between necessities and discretionary items or how consumers adjust their spending to changes in the economy.

Additionally, the 2018 statistics represent a 10-year period, from the Great Recession of 2009, when national current-dollar GDP and PCE were at low points compared to the prior year. In 2009, national current-dollar GDP decreased 1.8 percent and national current-dollar PCE decreased 1.3 percent from the preceding year.

From 2009 to 2018, national PCE grew 4.0 percent on average, and like the 2018 PCE by state statistics, all states and the District of Columbia experienced PCE growth during this time. The states with the largest average percent change in PCE from 2009 to 2018 were in the western half of the United States. The fastest growing states were North Dakota, Utah, and Idaho, which increased 5.7 percent, 5.2 percent, and 5.1 percent, respectively. In contrast, the states with slowest average growth rates in PCE from 2009 to

2018 were concentrated in the New England and the Southeast regions. The slowest growing states on average were Mississippi, Connecticut, and Maine, which increased 2.9 percent, 2.9 percent, and 3.0 percent, respectively (chart 15).

Chart 15. Average Annual Percent Change in Total Personal Consumption Expenditures by State, 2009–2018



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North Dakota

North Dakota was the fastest growing state over the 2009–2018 time period, with PCE increasing on average 5.7 percent. Similar to the other high performing states, North Dakota's average growth was driven by categories with large budget shares of total state PCE, such as housing and utilities, health care, and financial services and insurance.

North Dakota had several consumption categories that ranked among the fastest growing in the country. Housing and utilities expenditures grew at an average of 6.7 percent from 2009–2018, the fastest growth of any state during this time period. Health care expenditures grew at an average of 5.6 percent, the third fastest rate in the United States. Financial services and insurance was another standout category for North Dakota, with a 7.2 percent growth rate, the fourth fastest in the United States during this time period (table 6).

Table 6. North Dakota Total Personal Consumption Expenditures by State and Detail Categories, 2009 and 2018

[Millions of dollars]

Category	2009	2018	Average annual percent change
Personal consumption expenditures	22,448	36,863	5.7
Goods	8,761	13,458	4.9
Durable goods	3,067	5,026	5.6
Motor vehicles and parts	1,079	1,876	6.3
Furnishings and durable household equipment	645	1,038	5.4
Recreational goods and vehicles	889	1,424	5.4
Other durable goods	454	689	4.7
Nondurable goods	5,694	8,431	4.5
Food and beverages purchased for off-premises consumption	1,696	2,423	4.0
Clothing and footwear	692	1,024	4.5
Gasoline and other energy goods	1,393	2,120	4.8
Other nondurable goods	1,914	2,863	4.6
Services	13,687	23,405	6.1
Household consumption expenditures (for services)	12,908	22,057	6.1
Housing and utilities	2,820	5,069	6.7
Health care	4,043	6,612	5.6
Transportation services	580	1,119	7.6
Recreation services	822	1,363	5.8
Food services and accommodations	1,381	2,284	5.8
Financial services and insurance	1,724	3,234	7.2
Other services	1,539	2,376	4.9
Final consumption expenditures of nonprofit institutions serving households	778	1,348	6.3
Gross output of nonprofit institutions	2,124	3,527	5.8
Less: Receipts from sales of goods and services by nonprofit institutions	1,345	2,179	5.5

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

Housing and utilities expenditures include rents paid by tenants for tenant-occupied housing, imputed rental values for owner-occupied housing, rental value of farm dwellings, spending on group housing, and spending on utilities consisting of water supply, sanitation, electricity, and gas. Health care expenditures include spending on outpatient services, hospital, and nursing home services. Outpatient services consist of physician services, dental services, and paramedical services. Health care services do not include pharmaceuticals or medical products, as these are classified in other nondurable goods. Financial services and insurance expenditures consist of spending on financial service charges, fees, and commissions as well as an imputed value for financial services furnished without payment. Insurance expenditures consist of life insurance, net household insurance, net health insurance, net motor vehicle insurance, and other transportation insurance.

These categories were among the largest contributors to growth in North Dakota, and they comprised the largest portion of total PCE for the state. In 2009, housing and utilities, health care, and financial services and insurance combined to make 38 percent of total PCE. In 2018, these three categories increased their share to 41 percent at the expense of the goods categories, which include purchases like groceries and gasoline (charts 16 and 17).

Chart 16. North Dakota Personal Consumption Expenditures Category Shares, 2009

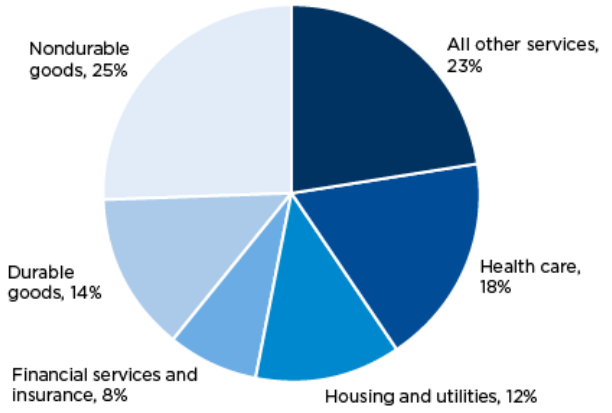

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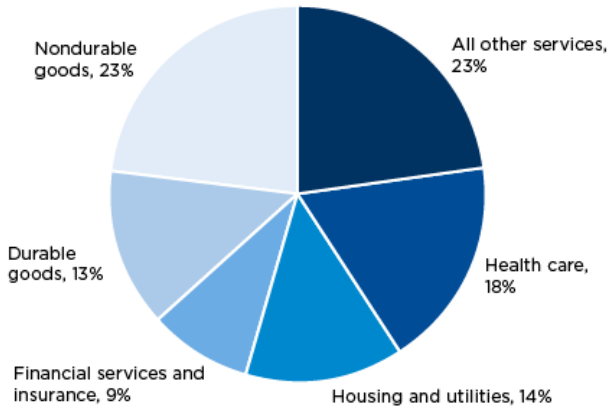
Chart 17. North Dakota Personal Consumption Expenditures Category Shares, 2018



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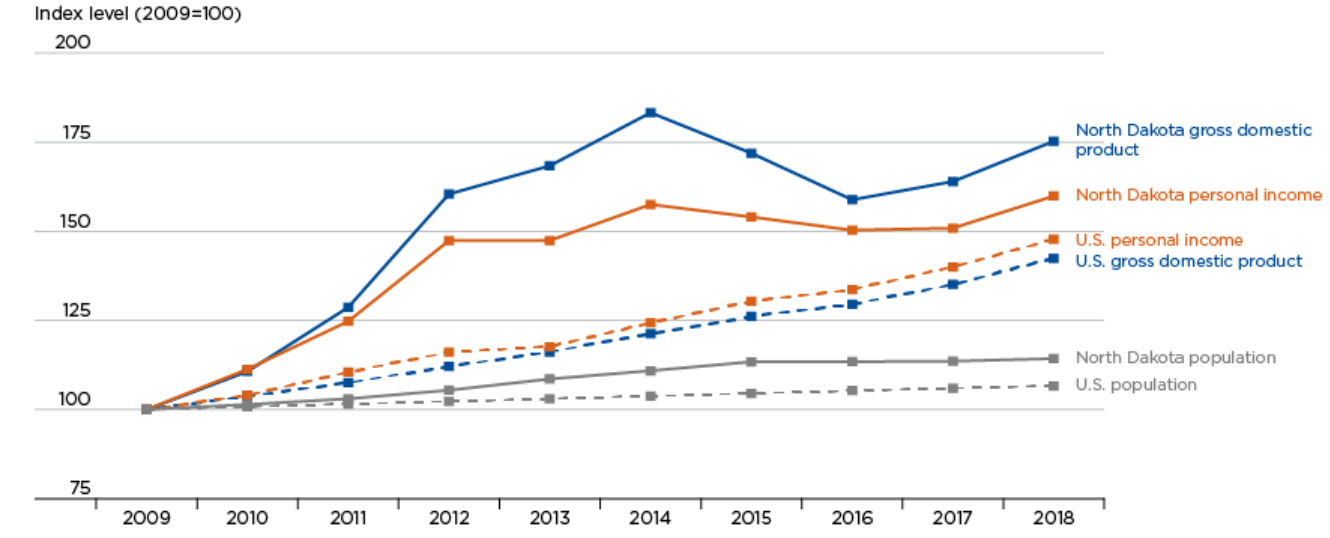
The strong growth in North Dakota was also evident in BEA state personal income and GDP statistics. During the 2009–2018 period, nominal personal income had an average annual growth rate of 6.0 percent, and nominal GDP had an average annual growth rate of 7.5 percent, while nationally, personal income and GDP grew at a rate of 4.4 percent and 4.0 percent, respectively (chart 18).

Chart 18. Indexed Economic Indicators for North Dakota and United States, 2009–2018



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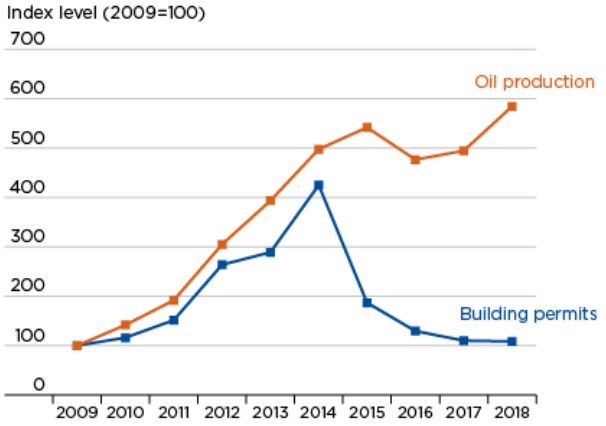
When evaluating personal income and GDP statistics, it is important to consider their measure and scope. Personal income by state is the income received by, or on behalf of, all persons from all sources—from participation as laborers in production, from owning a home or business, from the ownership of financial assets, and from government and business in the form of transfers. Personal income by state is measured on a place-of-residence basis. GDP by state is the value of goods and services produced by the labor and property located in a state. GDP by state is measured on a place-of-work basis.

The oil boom in North Dakota played a central role in the state's economic performance over the period. The boom began in the mid-2000s with the discovery of the Parshall field in the Bakken formation. The discovery and subsequent mining expansion helped mitigate the effects of the Great Recession in 2009, as oil and gas extraction continued to accelerate into the early 2010s. The oil boom contributed to the state's economic expansion in several ways, including a population increase, as people flocked to the state to fill

jobs. During this time, North Dakota had among the lowest rates of unemployment in the country. In turn, the increase in population fueled other aspects of the economy, including housing construction, personal income, and PCE.

The average growth in PCE matched the expansion of oil production in North Dakota during that time period. Oil production increased every year from 2009 to 2015, with a slight dip in 2016, followed by expansion again in 2018. Overall, oil production increased at a strong average annual growth rate of 48.4 percent (chart 19). During the same period, more workers found housing in the state. Building permits for new housing increased each year until a spike in 2014, resulting in an average annual growth rate of 32.5 percent from 2009–2014. Building permits then decreased as fewer houses were built from 2014–2018. The average annual growth rate of building permits from 2009–2018 was 0.8 percent.

Chart 19. Indexed Percent Changes for North Dakota Building Permits and Oil Production, 2009–2018



Sources. Census Bureau Building Permits Survey, North Dakota Department of Mineral Resources
U.S. Bureau of Economic Analysis

Connecticut

Connecticut was among the slowest growing states for the 2009–2018 time period, with PCE increasing 2.9 percent on average. Connecticut's slow growth was emblematic of other states in the same region, including Rhode Island and Maine. A common characteristic for the slow growth was an underperforming category with a large budget share of total state PCE, such as housing and utilities or health care.

Expenditures on housing and utilities in Connecticut had a modest average growth rate of 2.6 percent from 2009 to 2018. In contrast, the average national growth rate for housing and utilities expenditures was 3.5 percent, while North Dakota, the fastest growing state, boasts a growth rate of 6.7 percent during the same period. Similarly, the growth rate for expenditures on health care in Connecticut was 2.5 percent, while nationally, expenditures on health care services had a growth rate of 4.1 percent. Other categories contributing to the slow growth were expenditures on food and beverages purchased for off-premises consumption, which grew 2.2 percent, and expenditures on clothing and footwear, which grew 1.3 percent. Furthermore, Connecticut was the only state with a PCE category that decreased in value over the 2009–2018 period. The average growth rate of expenditures on gasoline and other energy goods decreased an average of 0.4 percent (table 7).

Table 7. Connecticut Total Personal Consumption Expenditures by State and Detail Categories, 2009 and 2018

[Millions of dollars]

Category	2009	2018	Average annual percent change
Personal consumption expenditures	145,915	189,141	2.9
Goods	43,401	54,377	2.5
Durable goods	13,535	17,609	3.0
Motor vehicles and parts	4,105	5,713	3.7
Furnishings and durable household equipment	3,343	4,320	2.9
Recreational goods and vehicles	3,912	4,985	2.7
Other durable goods	2,175	2,591	2.0
Nondurable goods	29,866	36,769	2.3
Food and beverages purchased for off-premises consumption	9,981	12,147	2.2
Clothing and footwear	4,169	4,674	1.3
Gasoline and other energy goods	3,703	3,574	–0.4
Other nondurable goods	12,013	16,374	3.5
Services	102,514	134,764	3.1
Household consumption expenditures (for services)	97,442	127,567	3.0
Housing and utilities	30,415	38,235	2.6
Health care	22,580	28,186	2.5
Transportation services	4,902	6,671	3.5
Recreation services	5,782	7,212	2.5
Food services and accommodations	7,186	10,182	3.9
Financial services and insurance	12,431	18,159	4.3
Other services	14,147	18,921	3.3
Final consumption expenditures of nonprofit institutions serving households	5,072	7,196	4.0
Gross output of nonprofit institutions	19,011	25,425	3.3
Less: Receipts from sales of goods and services by nonprofit institutions	13,939	18,229	3.0

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

In 2009, housing and utilities and health care were 37 percent of the total expenditures—the largest detail categories based on current-dollar expenditures. However, the share of expenditures had decreased to 35 percent of the total in 2018. Meanwhile, nondurable goods, which includes gasoline and other energy goods, had a 20 percent share of total PCE in 2009, but the share decreased to 19 percent of total state PCE in 2018 (charts 20 and 21).

Chart 20. Connecticut Personal Consumption Expenditures Category Shares, 2009

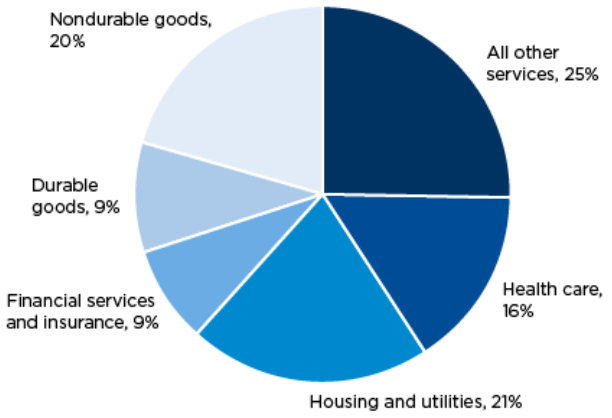


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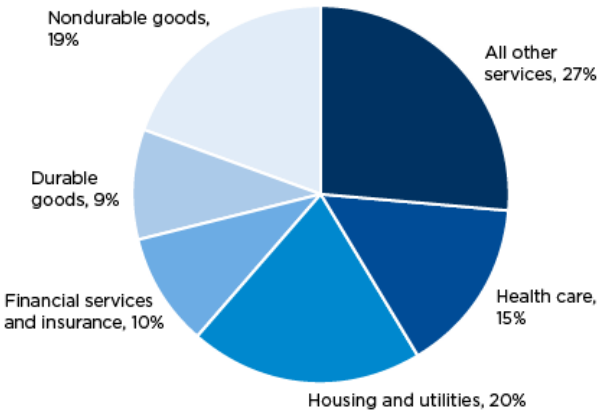
Chart 21. Connecticut Personal Consumption Expenditures Category Shares, 2018



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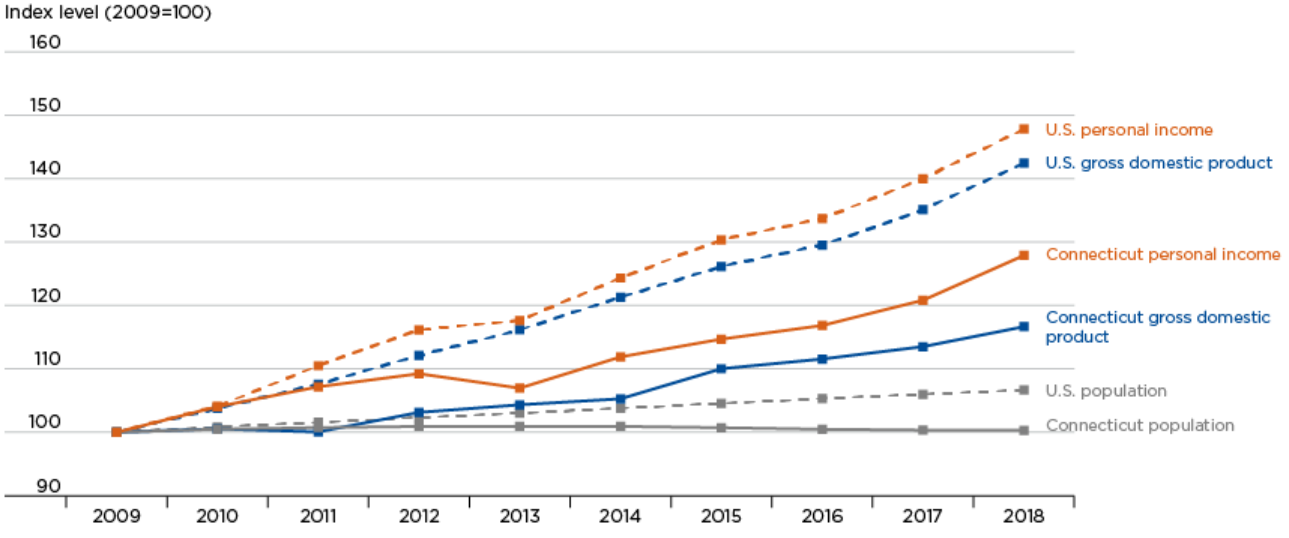
The slow growth in Connecticut was also evident in BEA personal income, GDP, and population statistics. During the 2009–2018 period, personal income had a growth rate of 2.8 percent, and GDP grew 1.7 percent, while nationally, personal income and GDP grew at a rate of 4.4 percent and 4.0 percent, respectively. Connecticut has a larger than average share of its economy associated with the finance and insurance industries compared to the U.S. average. These industries were affected disproportionally during the Great Recession. While these industries have recovered nationally since then, the pace of the recovery has not been as fast as in Connecticut. During the 2009–2018 period, GDP growth in the finance and insurance industry in Connecticut increased 0.9 percent compared to 5.5 percent for the nation, while earnings (the portion of personal income earned by laborers) in finance and insurance in Connecticut increased 0.5 percent compared to 4.1 percent for the nation. The slow recovery in finance and insurance has kept the overall average growth in Connecticut below average for many of the state's economic indicators (chart 22).

Chart 22. Indexed Economic Indicators for Connecticut and United States, 2009–2018



U.S. Bureau of Economic Analysis

Connecticut's population growth was another factor affecting its economy. The state's population growth was below the national average over the last 10 years, including the last 5 years, when the population declined. There are three components of a state's population change: natural change (difference between births and deaths), net domestic migration (difference between U.S. residents moving to and leaving a

state), and net international migration (difference between non-U.S. residents moving to and leaving a state). The primary contributor to Connecticut's population change was net domestic migration. While natural change in Connecticut was consistent with the overall national trend, the net domestic migration trend for the 2009–2018 period showed more residents were leaving the state than could be replaced by the other components (table 8).

Table 8. Components of Population Change in Connecticut, 2009–2018

Year	Population change	Natural change	Net domestic migration	Net international migration
2009	15,356	12,170	−7,824	11,322
2010	4,978	2,649	124	2,452
2011	8,898	8,327	−12,343	13,027
2012	6,372	7,766	−17,392	16,035
2013	520	6,354	−16,929	11,171
2014	−132	6,490	−25,041	18,263
2015	−7,274	5,946	−29,986	16,614
2016	−8,835	5,807	−29,202	14,489
2017	−4,794	4,327	−23,652	14,454
2018	−1,215	3,736	−21,509	16,494

Source. U.S. Census Bureau

Revisions

The October release of PCE by state included updated statistics for 2014–2017. The updated statistics incorporated the results of the 2019 annual update of the National Income and Product Accounts and newly available and revised regional source data. Source data that were either revised or newly released included new and revised data from the Bureau of Labor Statistics Quarterly Census of Employment and Wages for 2014–2018 and new 2017 data from the Census Bureau American Community Survey (table 9).

Table 9. Summary of Source data

Component	Major sources	Updates and revisions
Durable goods; nondurable goods; some services	Economic Census; Quarterly Census of Employment and Wages (QCEW)	Revised QCEW 2014–2017, new 2018
Housing and utilities	American Community Survey (ACS)	New 2017 ACS data
	Owner-to-renter ratios from Regional Price Parity program	New owner-to-renters ratios based on the 2016 ACS panel (2012–2016)
	Economic Research Service data on imputed rental value of farm dwellings (for farm housing)	Revised 2016 and new 2017 price and volume data for electricity
	Water supply data from U.S. Geological Survey and National Association of Clean Water Agencies (NACWA) regional water price index	Revised 2016–2017 price and volume data for natural gas
	Volume and price data on electricity and natural gas consumption from the Energy Information Administration	Revised NACWA service charge index 2013–2017
Transportation services	Economic Census, QCEW	Revised QCEW 2014–2017, new 2018
	Amtrak ridership by state (rail transportation)	New data from the National Association of Rail Passengers 2017
	Bureau of Transportation Statistics (BTS) passenger enplanement by state (air transportation)	Updated 2015–2017 BTS data
Financial services and insurance	Federal Deposit Insurance Corporation (FDIC), National Credit Union Administration (NCUA), Internal Revenue Service (IRS), National Association of Insurance Commissioners (NAIC)	New 2017 data from FDIC, NCUA, IRS, NAIC
Health care services	Economic Census for some subcomponents, QCEW, Center for Medicare and Medicaid Services	Revised QCEW 2014–2017, new 2018

Current-dollar PCE nationwide was revised downward 0.1 percent for 2017 (table 10). The revisions ranged from a downward 0.5 percent in the District of Columbia to an upward 0.3 percent in South Dakota. Current-dollar PCE was revised downward in 30 states and the District of Columbia and was revised upward in 20 states. The revisions were due to new and revised source data, as there were no methodological improvements to the statistics.

Table 10. Revisions to Total Personal Consumption Expenditures (PCE) by State, 2014–2017

	Revised PCE (millions of dollars)				Revision (millions of dollars)				Percent revision			
	2014	2015	2016	2017	2014	2015	2016	2017	2014	2015	2016	2017
United States[1]	**11,814,798**	**12,277,398**	**12,741,883**	**13,305,559**	**−1,279**	**−10,249**	**−18,399**	**−9,304**	**0.0**	**−0.1**	**−0.1**	**−0.1**
New England	**675,701**	**698,931**	**720,066**	**748,738**	**−225**	**−618**	**−1,012**	**307**	**0.0**	**−0.1**	**−0.1**	**0.0**
Connecticut	167,846	172,191	176,126	181,887	−123	−255	−246	−105	−0.1	−0.1	−0.1	−0.1
Maine	52,972	54,214	55,700	57,989	−28	−75	−139	59	−0.1	−0.1	−0.2	0.1
Massachusetts	324,369	337,925	350,117	365,714	−56	−298	−438	309	0.0	−0.1	−0.1	0.1
New Hampshire	61,286	63,074	64,884	67,534	−2	−13	−82	39	0.0	0.0	−0.1	0.1
Rhode Island	41,687	43,185	44,283	45,710	−14	21	−64	−60	0.0	0.0	−0.1	−0.1
Vermont	27,541	28,342	28,955	29,904	−2	2	−42	65	0.0	0.0	−0.1	0.2
Mideast	**2,098,141**	**2,168,700**	**2,241,141**	**2,328,039**	**−586**	**−783**	**−2,207**	**−3,725**	**0.0**	**0.0**	**−0.1**	**−0.2**
Delaware	36,814	38,195	39,313	40,711	−26	−45	−40	−28	−0.1	−0.1	−0.1	−0.1
District of Columbia	36,768	38,872	40,367	42,069	−58	−45	−73	−204	−0.2	−0.1	−0.2	−0.5
Maryland	243,828	252,947	261,760	272,369	−89	−12	−306	−187	0.0	0.0	−0.1	−0.1
New Jersey	409,845	423,080	435,270	449,237	−134	291	−346	−240	0.0	0.1	−0.1	−0.1
New York	870,260	901,125	936,268	976,732	−135	−587	−604	−1,667	0.0	−0.1	−0.1	−0.2
Pennsylvania	500,626	514,480	528,162	546,921	−143	−387	−837	−1,400	0.0	−0.1	−0.2	−0.3
Great Lakes	**1,694,766**	**1,749,160**	**1,804,437**	**1,876,027**	**−111**	**−1,359**	**−3,153**	**−1,490**	**0.0**	**−0.1**	**−0.2**	**−0.1**
Illinois	494,570	512,441	528,632	549,540	−92	−413	−803	−17	0.0	−0.1	−0.2	0.0
Indiana	217,291	223,339	231,053	242,122	67	−36	−278	81	0.0	0.0	−0.1	0.0
Michigan	352,709	363,600	376,136	390,263	−41	−328	−1,169	−632	0.0	−0.1	−0.3	−0.2
Ohio	418,262	431,446	442,596	458,883	−112	−287	−705	−498	0.0	−0.1	−0.2	−0.1
Wisconsin	211,934	218,335	226,021	235,220	67	−295	−198	−424	0.0	−0.1	−0.1	−0.2
Plains	**776,267**	**801,108**	**827,366**	**863,154**	**−216**	**−772**	**−1,746**	**−150**	**0.0**	**−0.1**	**−0.2**	**0.0**
Iowa	107,281	110,378	113,876	118,533	−16	−76	−346	90	0.0	−0.1	−0.3	0.1
Kansas	97,374	100,199	102,838	106,176	−52	−16	−244	−253	−0.1	0.0	−0.2	−0.2
Minnesota	221,445	229,645	239,698	253,012	−82	−416	−491	89	0.0	−0.2	−0.2	0.0
Missouri	214,401	220,915	226,997	235,905	−138	−317	−516	−194	−0.1	−0.1	−0.2	−0.1
Nebraska	68,812	71,138	74,009	77,068	−7	−29	−118	−43	0.0	0.0	−0.2	−0.1
North Dakota	34,315	34,943	34,603	35,353	90	87	16	66	0.3	0.2	0.0	0.2
South Dakota	32,640	33,891	35,345	37,107	−11	−5	−45	95	0.0	0.0	−0.1	0.3
Southeast	**2,701,997**	**2,808,783**	**2,913,198**	**3,037,883**	**−252**	**−2,893**	**−4,885**	**−2,413**	**0.0**	**−0.1**	**−0.2**	**−0.1**
Alabama	145,877	149,687	153,224	158,574	81	−59	−233	199	0.1	0.0	−0.2	0.1
Arkansas	88,427	91,127	94,581	98,838	4	−74	−132	72	0.0	−0.1	−0.1	0.1
Florida	723,031	762,444	793,162	829,401	102	−665	−904	0	0.0	−0.1	−0.1	0.0
Georgia	323,329	334,526	348,182	364,092	−74	−823	−944	−1,229	0.0	−0.2	−0.3	−0.3
Kentucky	135,755	140,286	145,217	150,668	−97	−130	−395	183	−0.1	−0.1	−0.3	0.1
Louisiana	149,279	154,228	157,719	162,059	−14	−90	−174	265	0.0	−0.1	−0.1	0.2
Mississippi	83,330	84,981	86,987	89,518	−52	−92	−177	−86	−0.1	−0.1	−0.2	−0.1
North Carolina	307,934	320,077	333,703	351,043	16	−257	−319	186	0.0	−0.1	−0.1	0.1
South Carolina	150,306	155,832	162,263	168,899	54	−47	−161	−382	0.0	0.0	−0.1	−0.2
Tennessee	206,229	214,137	222,868	234,042	−26	−14	−410	−379	0.0	0.0	−0.2	−0.2
Virginia	330,096	341,564	353,976	367,872	−187	−579	−926	−1,003	−0.1	−0.2	−0.3	−0.3

	Revised PCE (millions of dollars)				Revision (millions of dollars)				Percent revision			
	2014	2015	2016	2017	2014	2015	2016	2017	2014	2015	2016	2017
West Virginia	58,405	59,894	61,317	62,878	−58	−64	−111	−237	−0.1	−0.1	−0.2	−0.4
Southwest	**1,332,551**	**1,384,470**	**1,436,048**	**1,504,393**	**329**	**−972**	**−1,291**	**−1,430**	**0.0**	**−0.1**	**−0.1**	**−0.1**
Arizona	213,933	221,663	229,608	242,980	243	−48	−148	580	0.1	0.0	−0.1	0.2
New Mexico	67,007	68,924	70,646	72,613	−1	86	129	166	0.0	0.1	0.2	0.2
Oklahoma	120,775	123,558	126,312	129,642	−75	−192	−206	−295	−0.1	−0.2	−0.2	−0.2
Texas	930,836	970,326	1,009,482	1,059,158	162	−818	−1,066	−1,880	0.0	−0.1	−0.1	−0.2
Rocky Mountain	**408,213**	**428,718**	**450,410**	**475,684**	**103**	**35**	**−160**	**372**	**0.0**	**0.0**	**0.0**	**0.1**
Colorado	203,378	214,091	224,694	237,076	107	59	−38	237	0.1	0.0	0.0	0.1
Idaho	51,026	53,627	56,817	60,716	−9	−14	46	40	0.0	0.0	0.1	0.1
Montana	37,719	39,354	40,840	43,106	18	21	0	83	0.0	0.1	0.0	0.2
Utah	93,284	98,557	104,919	111,096	−23	−59	−116	94	0.0	−0.1	−0.1	0.1
Wyoming	22,806	23,088	23,140	23,691	10	28	−52	−82	0.0	0.1	−0.2	−0.3
Far West	**2,127,162**	**2,237,529**	**2,349,218**	**2,471,641**	**−321**	**−2,886**	**−3,945**	**−776**	**0.0**	**−0.1**	**−0.2**	**0.0**
Alaska	32,314	33,444	34,261	35,549	−6	−60	−71	12	0.0	−0.2	−0.2	0.0
California	1,506,940	1,587,051	1,668,316	1,753,358	−566	−2,303	−2,881	−725	0.0	−0.1	−0.2	0.0
Hawaii	57,788	60,111	62,839	65,911	49	−6	32	143	0.1	0.0	0.1	0.2
Nevada	105,160	109,639	114,088	118,886	−130	−337	−385	−453	−0.1	−0.3	−0.3	−0.4
Oregon	144,848	152,725	160,221	169,473	48	−112	−303	427	0.0	−0.1	−0.2	0.3
Washington	280,113	294,560	309,494	328,464	285	−68	−338	−180	0.1	0.0	−0.1	−0.1

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.

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, regardless of having a mortgage, this imputation represents the rent homeowners would pay if they rented the home 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, recordkeeping, 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.[1]

PCE by state statistics are consistent with BEA national PCE statistics, with respect to concepts and definitions, and with BEA 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.[2] 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.[3] 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 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; however, PCE by state includes 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.

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* 94 (September 2014).
3. In 2018, the net expenditures abroad by U.S. residents were 0.07 percent of national total PCE.

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1. U.S. Bureau of Economic Analysis, "Local Area Gross Domestic Product, 2018," news release (December 12, 2019).
2. U.S. Bureau of Economic Analysis, "Local Area Personal Income Methodology: November 2019."
3. Stephanie H. McCulla, Marissa J. Crawford, and Harvey L. Davis Jr., "The 2019 Annual Update of the National Income and Product Accounts," *Survey of Current Business* 99 (August 2019).
4. David G. Lenze, "Personal Income in the NIPAs and State Personal Income," *Survey* 99 (October 2019).
5. U.S. Bureau of Economic Analysis, "Local Area Personal Income Methodology: November 2019."