2014 LABOR MARKET AND ECONOMIC REPORT

U.S. economy
Washington's economy
Seasonal employment
Unemployment
Employment projections
Income and wages

Employment Security Department
WASHINGTON STATE

Labor Market and Performance Analysis
March 2015

2014 Labor Market and Economic Report

Published March 2015

This report was prepared in accordance with the Revised Code of Washington (RCW) 50.38.040.

Washington State Employment Security Department
Dale Peinecke, *commissioner*

Labor Market and Performance Analysis
Cynthia Forland, *director*

Report content based on data available through September 2014.

Report authors:

Fast facts:	Bruce Nimmo, *economic analyst*
Executive summary:	Paul Turek, *labor economist*
Chapter 1:	Paul Turek, *labor economist*
Chapter 2:	Paul Turek, *labor economist*
Chapter 3:	Alex Roubinchtein, *economic analyst* and Bruce Nimmo, *economic analyst*
Chapter 4:	Chris Thomas, *economic analyst* and Jeff Robinson, *research and forecasting manager*
Chapter 5:	Alex Roubinchtein, *economic analyst* and Bruce Nimmo, *economic analyst*
Chapter 6:	Scott Bailey, *economic analyst* and Anneliese Vance-Sherman, *economic analyst*
Chapter 7:	Bruce Nimmo, *economic analyst*

This report can be viewed online and downloaded at https://fortress.wa.gov/esd/employmentdata/.

Further analysis and detailed statistics are available from the Employment Security Department upon request.
For more information or copies of this report in alternate formats, please call 360-407-4500 or 800-215-1617.

Contents

Labor market fast facts

Fast facts 1. Labor force and unemployment, not seasonally adjusted*
Washington state, annual data 1980 through September 2014
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics

Year	Labor Force	Employed	Unemployed	Unemployment rate
1980	1,972,373	1,815,717	156,656	7.9%
1985	2,102,321	1,926,816	175,505	8.3%
1990	2,537,050	2,406,450	130,600	5.1%
1995	2,812,610	2,636,010	176,600	6.3%
2000	3,050,020	2,898,680	151,340	5.0%
2005	3,255,530	3,075,970	179,560	5.5%
2006	3,319,250	3,155,380	163,870	4.9%
2007	3,386,770	3,232,650	154,120	4.6%
2008	3,473,020	3,284,840	188,180	5.4%
2009	3,523,510	3,194,260	329,250	9.3%
2010	3,515,190	3,166,680	348,510	9.9%
2011	3,473,100	3,153,920	319,180	9.2%
2012	3,484,730	3,203,430	281,300	8.1%
2013	3,461,130	3,218,410	242,720	7.0%
2014 January through September	3,471,848	3,261,744	210,103	6.1%

*Historical values are subject to revision and may not equal prior report values.

Fast facts 2. Labor force and unemployment, not seasonally adjusted
Washington state metropolitan areas, January through September 2014
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics

Metropolitan area	Labor Force	Employed	Unemployed	Unemployment rate
Washington state	**3,471,848**	**3,261,744**	**210,103**	**6.1%**
Bellingham	103,121	96,927	6,194	6.0%
Bremerton	115,188	108,561	6,627	5.8%
Kennewick-Pasco-Richland	130,004	120,816	9,189	7.1%
Longview-Kelso	41,171	37,812	3,359	8.2%
Mount Vernon-Anacortes	55,421	51,621	3,800	6.9%
Olympia	124,680	117,256	7,424	6.0%
Seattle-Bellevue-Everett MD*	1,557,607	1,479,711	77,896	5.0%
Spokane	221,199	206,496	14,703	6.6%
Tacoma MD * (Pierce)	375,934	350,682	25,252	6.7%
Wenatchee	60,852	57,166	3,687	6.1%
Yakima	123,370	113,542	9,828	8.0%

*Metropolitan Division

Fast facts 3. Projected industry average annual growth rates
Washington state, 2012 through 2022
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics

NAICS	Industry sector	2013 Q2 to 2015 Q2	2012 to 2017	2017 to 2022
	Total nonfarm	**2.0%**	**2.0%**	**1.3%**
22, 48, 49	Transportation, warehousing and utilities	1.6%	1.5%	0.9%
23	Construction	4.6%	4.9%	1.9%
31-33	Manufacturing	0.7%	1.0%	0.4%
42	Wholesale trade	2.1%	2.0%	1.1%
44-45	Retail trade	1.5%	1.6%	1.0%
51	Information	1.8%	1.8%	1.6%
52	Financial activities	1.2%	1.3%	0.6%
54-56	Professional and business services	3.8%	3.4%	2.2%
61-62	Education and health services	2.6%	2.3%	2.0%
71-72	Leisure and hospitality	2.0%	2.3%	1.3%
GOV	Government	1.0%	1.0%	0.9%

Fast facts 4. Wages and employment by industry
Washington state, first-quarter 2014 (preliminary)
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

NAICS	Industry sector	Average number of firms	Wages paid first-quarter 2014	Average employment 2014	Average weekly wage 2014
	Total	**227,952**	**$40,940,459,709**	**2,947,534**	**$1,068**
GOV	Government	2,116	$7,160,333,286	522,754	$1,054
62	Healthcare and social assistance*	73,003	$4,183,895,445	388,626	$828
44-45	Retail trade	14,846	$2,875,114,612	326,335	$678
31-33	Manufacturing	6,910	$5,971,076,555	280,967	$1,635
72	Accommodation and food services	13,599	$1,126,921,319	235,445	$368
54-55	Professional, scientific and tech. services	21,279	$3,691,760,462	174,778	$1,625
56	Admin., support, waste mgmt. and remediation svcs.	10,618	$1,561,684,318	138,859	$865
23	Construction	21,407	$1,796,493,732	138,153	$1,000
42	Wholesale trade	13,788	$2,282,060,380	125,323	$1,401
51	Information	2,945	$3,341,725,668	106,657	$2,410
52	Finance and insurance	5,659	$2,108,062,611	90,499	$1,792
81	Other services (exc. public administration)*	17,272	$772,205,600	87,357	$680
48-49	Transportation and warehousing	4,305	$1,131,374,121	84,187	$1,034
11	Agriculture, forestry, fishing and hunting	7,192	$507,460,975	73,504	$531
71	Arts, entertainment and recreation	2,590	$284,889,540	44,637	$491
53	Real estate, rental and leasing	6,454	$527,709,334	44,498	$912
55	Management of companies and enterprises	663	$1,132,733,413	39,134	$2,227
61	Educational services	2,916	$345,567,294	39,026	$681
22	Utilities	234	$108,205,965	4,747	$1,753
21	Mining	156	$31,185,079	2,047	$1,172

*The non-economic industry code change artificially inflated the net employment for private healthcare and social assistance and deflated the other services data series. As a result, data in these sectors are not comparable to data from previous years.

Executive summary

U.S. economy and labor market

The pace of economic growth in the United States has averaged a solid, yet unspectacular 2.3 percent during the five and a half years since the country emerged from recession. The level of growth has been sufficient to allow the unemployment rate to drop back below 6 percent and has shown recent signs of strengthening. Quarterly growth since second-quarter 2013 averaged roughly 4 percent with the exception of the weather-plagued first-quarter 2014. The constraints that have previously limited the rate of recovery include:

- Modest consumer spending growth relative to previous expansions;
- Cautious business investment;
- Demographic trends that have led to a decline in the labor force participation rate, along with slower labor productivity growth; and
- Cutbacks in federal government purchases of goods and services to address budget shortfalls.

Total nonfarm employment in the United States reached 139.5 million in September 2014, up by 1.5 percent from September 2013. Private-sector job growth was up by 2.6 million, or 2.3 percent. Since reaching a post-recession low in February 2010, the private-sector has gained back all of the 8.8 million occupied jobs lost during the recession and added 1.6 million more. However, as of September 2014, construction employment remains slow to recover and was down 21.3 percent from its April 2006 peak. (Construction employment peaked in 2006 because the housing bubble collapsed before the start of the Great Recession.)

In September 2014, state and local government employment was still 601,000 below its peak, while Federal employment was still down 25,000 since the beginning of 2014.

Washington state's economy and labor market

Using state gross domestic product as the comparison measure, economic growth in Washington expanded by 2.7 percent in 2013 which outpaced the 1.9 percent growth achieved by the nation. From second-quarter 2013 to second-quarter 2014, personal income in the state increased 3.4 percent, compared to 2.4 percent nationally, adjusted for inflation. Consistent with that, total nonfarm employment increased during the same time period.

Seasonally adjusted private-sector employment reached a peak in February 2008 and declined until February 2010. Public-sector employment reached a peak in May 2010 and declined until December 2012. Total nonfarm employment has been increasing since second-quarter 2010.

Seasonal, structural and cyclical industry employment in Washington state

Industries in Washington that are most sensitive to seasonal forces are agriculture and tourism. Structural forces such as productivity improvement, policy changes and technological innovation have heavily influenced employment in software publishing, healthcare-related industries and wholesale electronic markets. Industries where the cyclical component accounts for the most change in employment include scenic and sightseeing transportation, support activities for mining, crop and animal production.

Unemployment in Washington

The seasonally adjusted unemployment rate in Washington peaked in first-quarter 2010 and remained above the national rate until October 2012. It has remained below the national rate through September 2014. The number of unemployment insurance recipients was nearly 58,000 in September 2014, down from a peak of just over 300,000 in January 2010. The construction industry was the most severely affected industry during the recession and accounted for a disproportionate share of the workers who exhausted unemployment benefits from October 2013 through September 2014.

The Mass Layoff Statistics program was eliminated by the U.S. Bureau of Labor Statistics in 2013. Data beyond that point on dislocated workers, mass layoffs and plant closures are no longer available for publication.

Employment projections

Total nonfarm employment is expected to grow at an average annual rate of 1.9 percent through 2017 and 1.3 percent from 2017 through 2022. The occupational groups likely to experience the fastest growth rates are construction and extraction, followed by computer and mathematical, legal and healthcare support occupations.

Income and wages

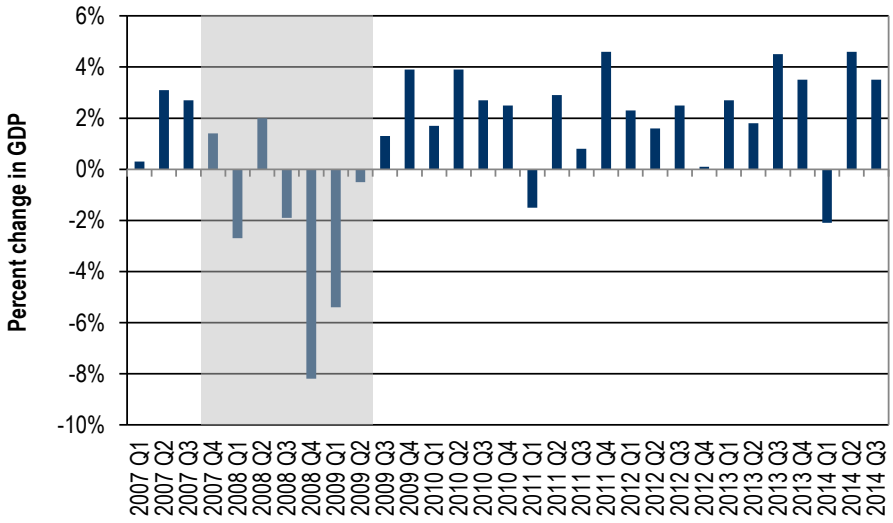
Recently released data show the median household income measured in 2013 dollars in Washington fell 4.7 percent from 2009 to 2013. The drop in household income helped to contribute to a decline in homeownership rates and increases in both the poverty rate and the share of households that received food stamps. From 2012 to 2013, the number of occupied jobs increased in all hourly wage ranges, with the exception of jobs paying less than $12 per hour. Job growth was greatest in high-wage occupations that paid more than $54 per hour. Unemployment benefits peaked in 2010 at $4.6 billion before receding during the recovery. In 2013, $1.8 billion in unemployment benefits were paid.

Chapter 1: U.S. economy and labor market

The recession that gripped the nation beginning in December 2007 officially ended in June 2009.[1] The next four years of economic recovery were characterized by sustained below-trend economic growth. Growth has generally been more robust since the second half of 2013. Gross domestic product (GDP), the measure of the output of goods and services in the economy over a period of time, rose by 3.5 percent from second-quarter 2014 to third-quarter 2014. GDP growth, shown in *Figure 1-1*, has risen at a 2.3 percent pace since the recession ended, which is nearly a full percentage point below the pace averaged during the 25 years prior to the recession. The rate of recovery has continued to be constrained by several factors. They include:

- Modest consumer spending growth relative to previous expansions.
- Cautious business investment.
- Demographic trends that have led to a decline in the labor force participation rate, along with slower labor productivity growth.
- Cutbacks in federal government purchases of goods and services to address budget shortfalls.

Figure 1-1. U.S. gross domestic product (chained 2009 dollars), quarterly percent change, seasonally adjusted annualized rate
United States, first-quarter 2007 through third-quarter 2014
Source: U.S. Bureau of Economic Analysis



U.S. recessions are shaded in gray.

The U.S. economy has started to show signs of stronger growth since the second half of 2013.

[1] National Bureau of Economic Research, Business Cycle Dating Committee.

The current expansion has reached its 64th month and can no longer be considered young. The average length of business cycle expansions (the time span from one recession to the next) since World War II has been 59 months. Recent business expansions have tended to last somewhat longer. The past three expansions lasted an average of 90 months, while the longest expansion in recorded U.S. history (from March 1991 to March 2001) lasted 120 months.[2] The low rate of economic growth combined with a slow recovery of jobs lost to the recession make the expansion seem younger than it is.

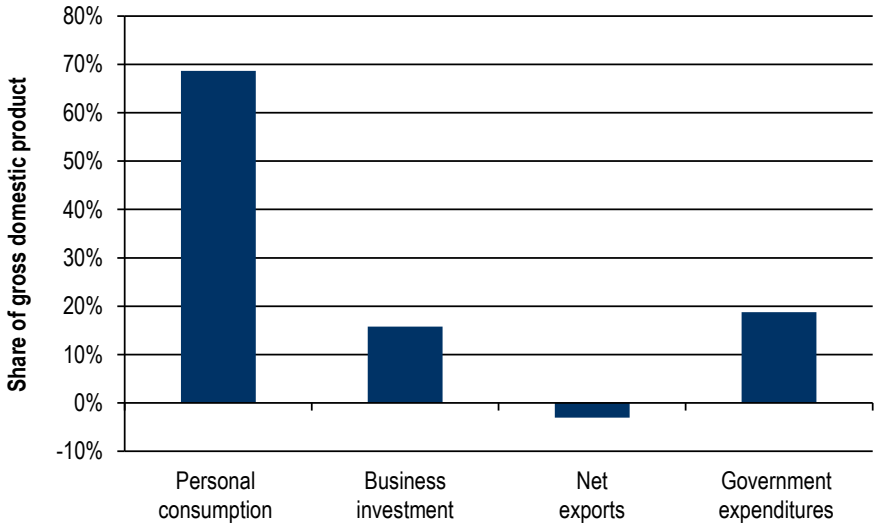
The economic recovery gained momentum in 2014. National payroll employment, as reported by businesses,[3] increased 256,000 in September. The average monthly job gain from January to September in 2014 was 230,000, which is considerably higher than the 194,000 average for all of 2013. The accelerated rate of job growth led to the recovery of the total number of nonfarm jobs lost during the recession in May 2014.

First-quarter GDP for 2014 declined by 2.1 percent, while GDP rebounded at a 4.6 and 3.5 percent pace in the second and third quarters respectively. The contraction during the first quarter can be viewed as somewhat of an anomaly. Unusually harsh weather across much of the U.S. over that time period disrupted economic activity and contributed to the contraction.[4] Declines in GDP during an expansion have occurred only 10 times since World War II, while the average bounce-back in GDP growth from those drops has been 3.7 percent.[5] Without taking account of first-quarter 2014, GDP growth has averaged more than 4 percent per quarter since the middle of 2013.

There are two primary ways to account for GDP. The income approach sums up the earnings the economy generates within a specific time period, while the expenditure approach adds up what has been spent. Both measures should arrive at the same total. The expenditure method is the more common approach and is calculated by adding total personal consumption spending by households, investment spending by businesses, government spending on projects and programs and spending by the international community on domestic products (*Figure 1-2*).

[2] National Bureau of Economic Research, Business Cycle Dating Committee.
[3] For information comparing the employer and household surveys, see: www.bls.gov/web/empsit/ces_cps_trends.pdf.
[4] www.forbes.com/sites/samanthasharf/2014/06/25/u-s-gdp-dropped-2-9-in-the-first-quarter-2014-sharply-lower-from-second-estimate/.
[5] U.S. Department of Commerce, Bureau of Economic Analysis.

Figure 1-2. Expenditure components of gross domestic product, seasonally adjusted
United States, 2013
Source: U.S. Bureau of Economic Analysis



Consumption expenditures account for the greatest share of GDP.

Consumer spending growth averaging 2 percent

Consumer spending makes the greatest dollar-wise contribution to GDP. As such, consumer spending (technically, personal consumption) has seen modest growth consistent with GDP. Inflation-adjusted consumption has grown at only 2.3 percent on average since the recession ended, down from the 3.0 percent pace preceding the recession. The main drivers of this slow growth have been the depth of job losses during this recession combined with tight credit conditions and erosion of household wealth.

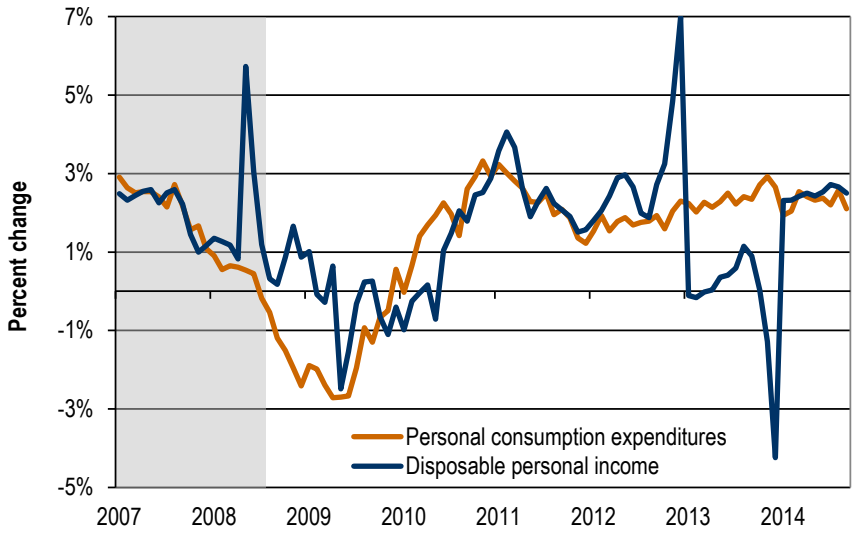
Personal consumption over the first three quarters of 2014 was about the same as that of a year earlier (*Figure 1-3*). Personal consumption growth averaged roughly 2.3 percent over the first three quarters of both years. From September 2013 to September 2014, real personal consumption expenditures were up by 2.1 percent.

Disposable income growth surged by 7 percent in December 2012 and grew by just 0.8 percent from January through March 2013, as individuals realized dividend and capital gains income at the end of 2012 to avoid higher 2013 tax rates. This effectively caused individuals to pull income into 2012 from 2013. Other than that, personal consumption growth has exceeded income growth from second-quarter 2011 through all of 2013. Real disposable income growth declined again in December 2013. However, the magnitude of the drop is overstated since disposable income was artificially

high in December 2012 due to the impending tax law changes. From September 2013 to September 2014, real disposable income was up 1.6 percent.

Consumer spending growth declined in September 2014 relative to August 2014 and has been growing slower in 2014 on an annual basis relative to the growth of income. In dollar terms, incomes are now growing faster than consumption expenditures, which in turn should be supportive of longer term consumer spending growth.

Figure 1-3. Percent change in inflation-adjusted disposable income and personal consumption expenditures, seasonally adjusted annualized rate
United States, January 2007 through September 2014
Source: U.S. Bureau of Economic Analysis

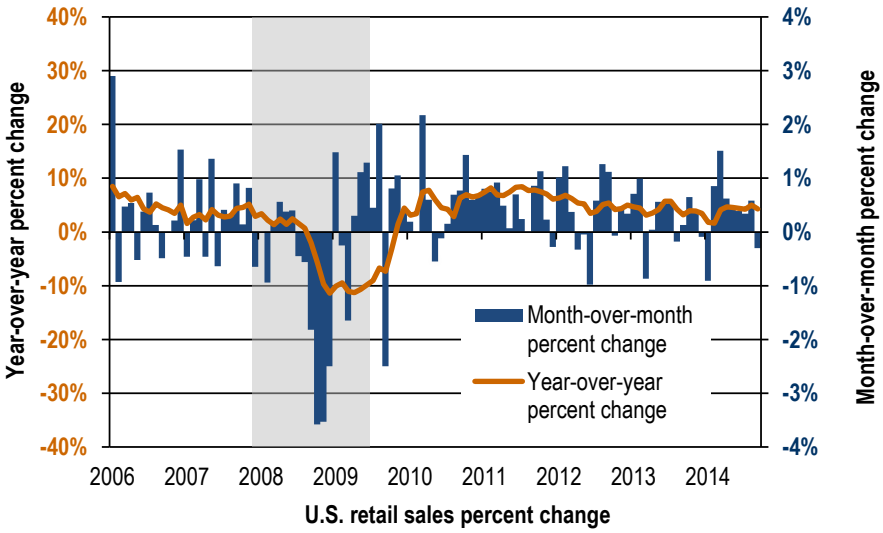


U.S. recessions are shaded in gray.

Growth in personal income is now outpacing consumption.

Retail sales are a component of personal consumption expenditures. Thus far in 2014, retail sales data suggest the U.S. economy remains on a path of moderate growth (*Figure 1-4*). Retail sales declined by 0.3 percent in September 2014 as lower gasoline prices combined with a slowdown in spending activity. The decline follows a 0.6 percent rise the previous month. It is also the first decline since January 2014 when severe weather across much of the nation reduced sales traffic. Despite the recent monthly decline, retail sales are still up 4.3 percent from September 2013.

Figure 1-4. U.S. retail sales, month-over-month and year-over-year percent change
United States, January 2006 through September 2014
Source: U.S. Census Bureau, Monthly and Annual Retail Trade Report



U.S. recessions are shaded in gray.

Increases in retail sales have been mostly consistent with pre-recession levels.

Federal Reserve gradually ending stimulus

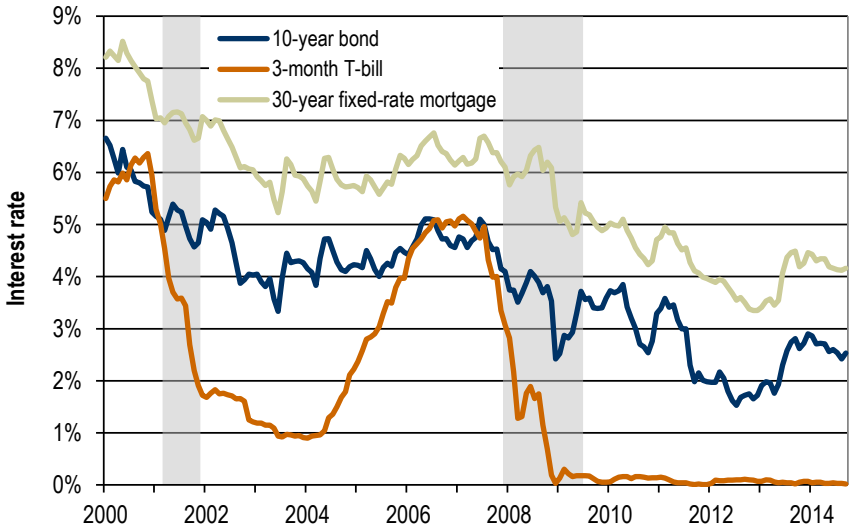
The Federal Reserve Board (Fed) typically stimulates the economy by reducing short-term interest rates to encourage more lending and spending. Should this approach prove to not have the desired effect, the Fed has the latitude to turn to the less conventional tool of quantitative easing (QE). This approach allows the Fed to purchase financial assets such as long-term Treasury securities or mortgage-backed securities from commercial banks and other financial institutions. This pumps money into the U.S. economy and reduces long-term interest rates further. The Fed turned to quantitative easing in the wake of the recent recession,[6] which seems to have had the desired effect on interest rates (*Figure 1-5*). Although longer-term interest rates increased during the second half of 2013, they have mostly moderated over 2014 and remain historically low overall.

In mid-2013, a widely-held belief emerged in financial markets that the Fed was about to pull back on its stimulus by reducing, or "tapering" the size of its bond-buying program. Mortgage and bond interest rates spiked before gradually moving lower beginning in 2014. The Fed instead elected to delay the start of tapering until its December 2013 meeting. The tapering process gradually reduced the monthly purchase

[6] "Monetary Policy Report," Board of Governors of the Federal Reserve System, July 17, 2013: www.federalreserve.gov/monetarypolicy/files/20130717_mprfullreport.pdf.

amount of bonds by the Fed until it reached its end with one last purchase in October 2014. Even after the tapering ended, the Fed has continued to add support to the economy by holding its interest rates near zero.

Figure 1-5. Selected interest rates
United States, January 2000 through September 2014
Source: Federal Reserve Board



U.S. recessions are shaded in gray.

Federal Reserve Board policy measures seem to have sustained low interest rates.

Construction activity slowly responding to low interest rates

Business investment has gradually been regaining its footing. The level of inflation-adjusted total private fixed investment spending rose by 5.1 percent from third-quarter 2013 through third-quarter 2014.[7]

An important category of private fixed investment is the construction of new residential and nonresidential buildings. Construction is recovering, although slowly (*Figure 1-6*), bolstered by low interest rates.

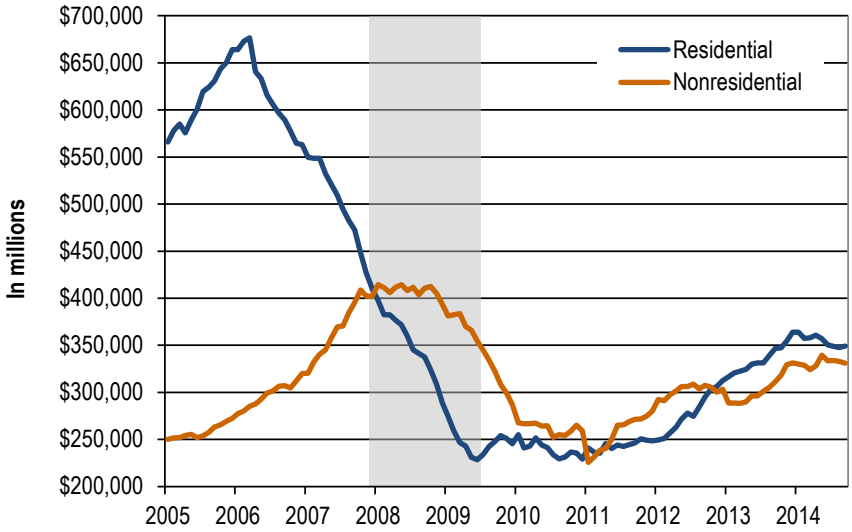
Residential construction reached its pre-recession monthly peak in early 2006, when it added $676 billion to the economy. It reached a low in 2009, moved along the bottom through 2011, before slowly beginning to recover to roughly $355 billion in 2014. Most of the gains have come from apartment construction. Starts of single-family homes have taken longer to get back on track even though the availability of existing homes for sale remains low and the sale of new homes has been improving.

[7] Distribution of Gross Domestic Product Table F.6, Federal Reserve Statistical Release: www.federalreserve.gov/releases/z1/current/accessible/f6.htm.

Nonresidential construction makes up a significant portion of business investment and includes shopping centers, office and industrial buildings, hotels, medical facilities and buildings used for education. Nonresidential construction investment peaked during the recession but began declining before the recession ended. Many of these capital investment projects are longer term in nature, reflecting longer start-up horizons, financial feasibility studies and zoning approvals.

Construction spending improved over the course of the year from September 2013 to September 2014, primarily in private nonresidential construction, which was up 6.3 percent. Private residential construction spending rose by less than one percent during the same time. Following four consecutive monthly declines, residential spending increased by 0.4 percent in September 2014, which might help alleviate fears that the sector has stalled.

Figure 1-6. Value of private construction, millions of dollars, seasonally adjusted annualized rate
United States, January 2005 through September 2014
Source: U.S. Census Bureau, Construction Spending



U.S. recessions are shaded in gray.

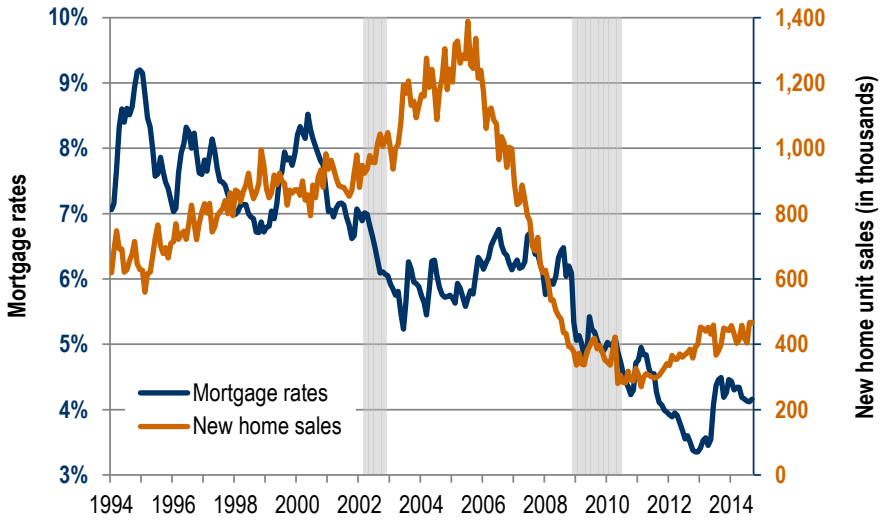
Construction activity has been slowly rebounding since the recession ended.

Housing recovery continues on a limited basis

Mortgage rates on housing moved lower as the housing market collapsed. The Federal Reserve Board's monetary policies drove them even lower. As economic conditions began improving, mortgage rates stayed low and lending conditions became less stringent,[8] the housing market began its long road back to recovery. New home sales improved as the number of foreclosed and lender-owned properties began to dwindle (*Figure 1-7*).

Mortgage rates moved lower in 2014 after rising in response to speculation anticipating the Fed's tightening of monetary policy. Home sales pulled back in response to the higher rates before moving to higher levels when rates began to moderate (*Figure 1-7*). Home sales improved modestly during the latter part of the summer in 2014 and appear to have moved into the fall with some momentum. New home sales inched up 0.2 percent in September after jumping 15.3 percent in August and are now up 22.6 percent from September 2013. The strong annual growth in home sales, however, is mostly a product of the very weak sales that occurred during September 2013.

Figure 1-7. Conventional 30-year mortgage rates and new home sales, thousands of units, seasonally adjusted annualized rate
United States, January 1994 through September 2014
Source: Federal Housing Finance Agency; U.S. Bureau of Economic Analysis, New Residential Sales



U.S. recessions are shaded in gray.

Sales of new homes have been gradually improving.

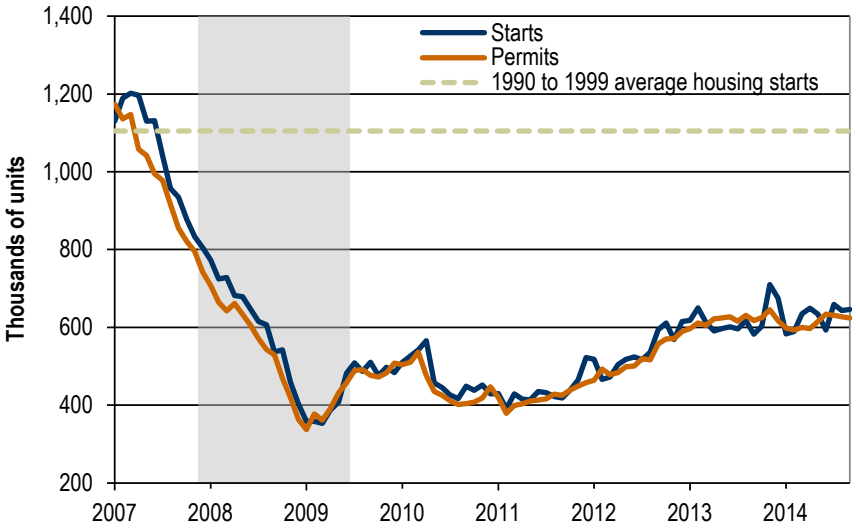
[8] The July 2013 Senior Loan Officer Opinion Survey on Bank Lending Practices, The Federal Reserve Board, July 2013: www.federalreserve.gov/boarddocs/snloansurvey/201308/default.htm.

Builder sentiment has risen in response to low interest rates and home price appreciation,[9] and this has been evidenced in an increasing number of housing permits and starts (*Figure 1-8*). The number of starts and permits began to increase in 2009, regressed slightly in early 2011 but then rose above 2010 levels in 2013 and 2014.

Single-family housing starts rose 1.1 percent in September 2014 relative to the previous month. Starts of single-family homes are also running slightly ahead of their pace from September 2013, being up 3.8 percent since that time. Although a positive development, the level of housing starts has considerable room to improve just to reach the levels averaged during the 1990s.

Permits for new single-family homes fell by 0.5 percent in September 2014 relative to the previous month and have now fallen by that amount for three straight months. Although the declines have all been relatively modest, single-family permits are now running slightly below starts, suggesting that starts may decline slightly in the coming months.

Figure 1-8. Single-family housing starts and permits, thousands of units, seasonally adjusted annualized rate compared to 1990 through 1999
United States, January 2007 through September 2014
Source: U.S. Census Bureau, Building Permits Survey and Survey of Construction



U.S. recessions are shaded in gray.

Home construction levels have been slowly improving during recovery.

[9] 2Q 2013, House Price Index, Federal Housing Finance Agency, August 22, 2013: www.fhfa.gov/Media/PublicAffairs/Pages/FHFA-House-Price-Index-Up-0-5-Percent-in-August-2014.aspx.

Government (public sector) spending a weak spot in the economy

After a post-recession peak, overall federal, state and local government spending has decreased (*Figure 1-9*). State and local governments were particularly hit hard by the recent recession. Due to the lag in tax collections, state tax receipts at first rose at the beginning of the recession, but began falling in fourth-quarter 2008. Sales taxes were the first to fall, but income taxes ultimately fell harder and faster. At their low points in second-quarter 2009, state tax receipts were 17 percent below their level one year earlier, while state personal income tax receipts were 27 percent lower. Federal stimulus, provided through the American Recovery and Reinvestment Act (ARRA) of 2009, offset at least some of those losses in the short term.[10]

State and local governments are generally expected to balance their budgets. To address the budget shortfalls that emerged during the recession, most state and local governments cut spending. The spending reductions, along with increased tax revenues from economic improvement in the private sector following the recession, have helped to improve state and local government finances. However, state and local governments continue to face short- and long-term fiscal challenges.[11]

Federal lawmakers enacted a variety of tax and spending measures aimed at reducing the severity of the recession and promote recovery. Some of these measures increased federal purchases, particularly in the first six quarters following the recession. Direct fiscal stimulus came from the Economic Stimulus Act of 2008, which was enacted in February 2008, and ARRA, which was enacted in February 2009. The Troubled Asset Relief Program (TARP), which was enacted in 2008, authorized the Secretary of the Treasury to purchase or insure troubled financial assets. Authority to make new purchases expired in October 2012.

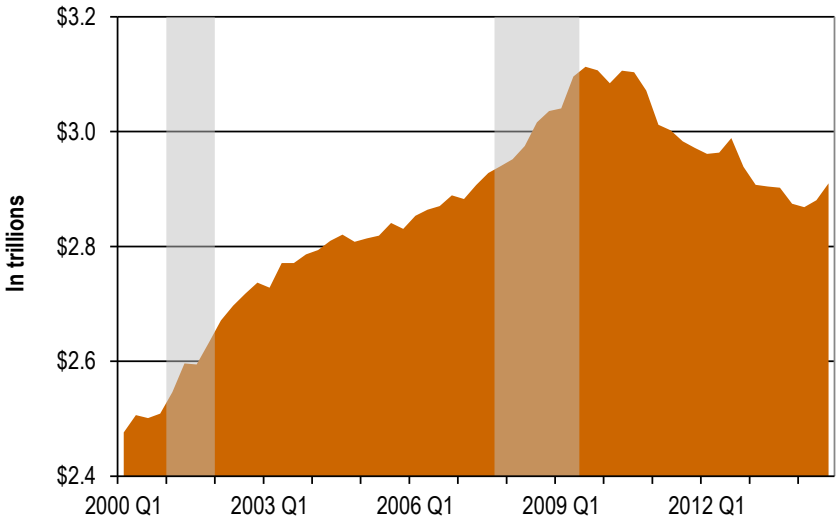
[10] "State and Local Budgets and the Great Recession," Gordon, Tracy, Brookings Institution, December 2012: www.brookings.edu/research/articles/2012/12/state-local-budgets-gordon.

[11] "State and Local Budgets and the Great Recession," Gordon, Tracy, Brookings Institution, December 2012; "State and Local Governments' Fiscal Outlook," U.S. Government Accountability Office, April 2013 Update: www.gao.gov/assets/660/654255.pdf.

Federal tax revenues also decreased as a result of the recession. Unlike states, the federal government has been able to borrow money to cover its proposed spending which resulted in increased federal deficits annually. Those deficits have begun to moderate, in part due to reduced federal spending and a recovering economy.[12] Reductions in spending have included across-the-board federal spending cuts, also referred to as "sequestration," enacted in the federal Budget Control Act of 2011, the Ryan-Murray Budget agreement, passed in 2013, and a continuing resolution, passed by the House and Senate in 2014.

Third-quarter 2014 government expenditures rose by 4.6 percent on an annualized basis. This was the strongest growth rate since second-quarter 2009 when ARRA first started to kick in.

Figure 1-9. Government purchases and gross investment, trillions of dollars adjusted for inflation, seasonally adjusted annualized rate
United States, first-quarter 2000 through third-quarter 2014
Source: U.S. Bureau of Economic Analysis, Government Current Receipts and Expenditures



U.S. recessions are shaded in gray.

After a post-recession peak, government spending had been on the decline but rose notably in third-quarter 2014.

[12] "Monthly Budget Review – Summary for Fiscal Year 2013," Congressional Budget Office, November 7, 2013: www.cbo.gov/sites/default/files/cbofiles/attachments/44716-%20MBR_FY2013_0.pdf.

Public-sector employment a weak spot in the national labor market

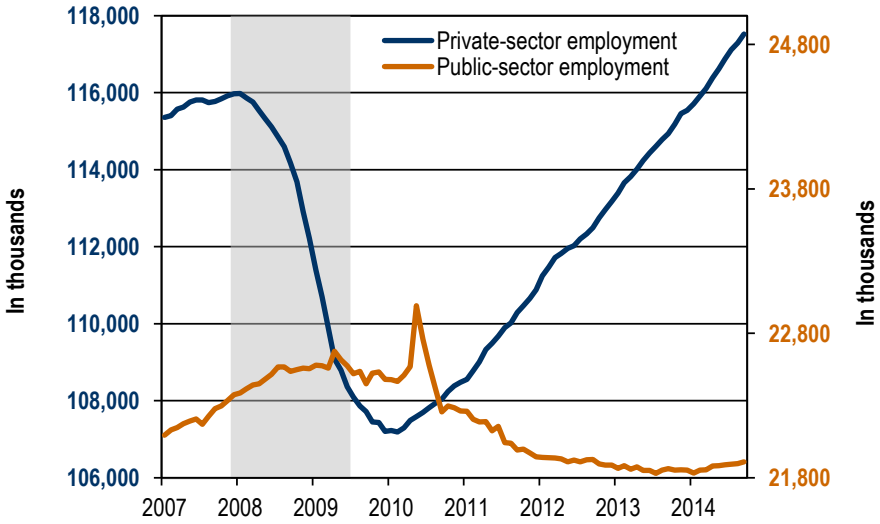
Two surveys are used by the U.S. Bureau of Labor Statistics (BLS) to measure national labor market trends. The establishment survey provides an estimate of the number of occupied jobs in the private and public sectors (federal, state and local government). The survey of households, which numbers roughly 50,000 to 55,000 households out of 115 million households in the country, is an estimate of the number of people either employed or unemployed but searching for a job.[13]

According to the establishment survey, total nonfarm employment reached 139.5 million in September 2014, up by 1.5 percent from September 2013. Total nonfarm employment had peaked at the beginning of the economic recession in January 2008 at 138.4 million before declining, so September 2014 employment establishes the latest post-recession high, 0.8 percent above the previous peak.

Figure 1-10 shows divergent trends in employment in the private and public sectors. While employment within the public sector has only recently begun to improve after the recession, private-sector employment has been steadily improving. Employment in the private sector bottomed in February 2010. Since then, employment has increased every month through September 2014. Relative to the trough, the private sector has gained back all of the 8.8 million occupied jobs lost during the recession and added 1.6 million more. In the public sector, improving state and local government payrolls have begun to offset losses in federal employment, so total government employment has risen since February 2014. Prior to that, state and local governments lost jobs for four straight years. In September 2014, state and local governments added 14,000 jobs. State and local government employment is now up 143,000 from its bottom, but is still 601,000 below the peak. Federal government layoffs have slowed, but federal employment is still down 25,000 since the beginning of 2014.

[13] The estimate of the number of households in the United States comes from the quarterly Homeownership and Vacancy report published by the U.S. Census Bureau.

Figure 1-10. Total private and public nonfarm employment, in thousands, seasonally adjusted
United States, January 2007 through September 2014
Source: U.S. Bureau of Labor Statistics, Current Employment Statistics



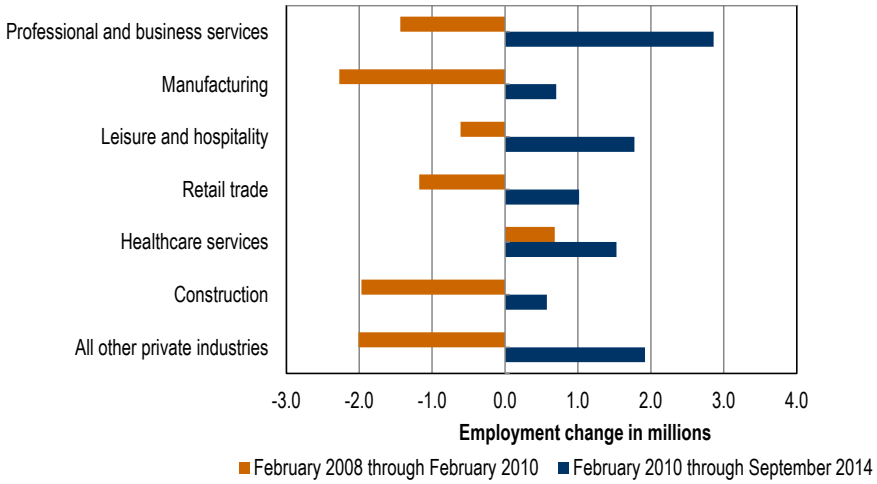
U.S. recessions are shaded in gray.

Private-sector employment has been recovering, but public-sector employment has only recently begun to increase.

Figure 1-11 shows how employment by industries fared during the recession and the post-recession recovery period. Total nonfarm employment began declining from its peak in January 2008 and reached its trough in February 2010. Several key points should be made:

- Professional and business services and leisure and hospitality employment gains have exceeded the losses during the recession.
- Healthcare services employment did not fall during the recession.
- Construction and manufacturing employment have been slower to recover.

Figure 1-11. Change in private-sector employment by industry, in millions
United States, February 2008 through September 2014
Source: U.S. Bureau of Labor Statistics, Current Employment Statistics

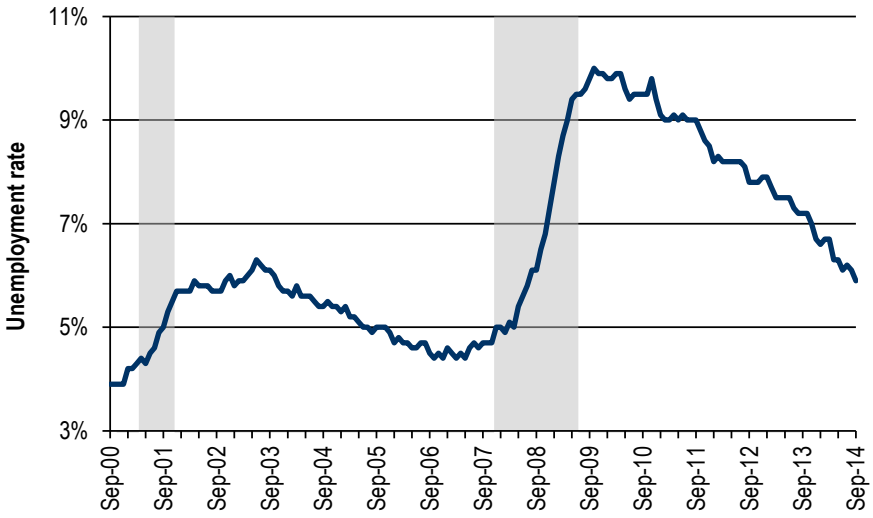


Private-sector employment has been bouncing back in service industries, but goods-producing industries (i.e., manufacturing, construction) have lagged behind.

Downward trend for unemployment rate

The unemployment rate is based on the national household survey and is perhaps the most widely used measure of the labor market. As of September 2014, the unemployment rate was 5.9 percent, down from 7.2 percent in September 2013 and down from the recession peak of 10.0 percent in October 2009 (*Figure 1-12*). This drop in the unemployment rate is an anticipated event when recoveries take place. However, the decline in unemployment rates since the 2007 to 2009 recession has taken place more swiftly then what occurred after the 2001 recession and the 1990 recession.

Figure 1-12. Monthly unemployment rate, seasonally adjusted
United States, September 2000 through September 2014
Source: U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics



U.S. recessions are shaded in gray.

The decline in the unemployment rate during this recovery has happened faster than during the last recovery period.

One major reason for the unexpectedly quick decline in the unemployment rate has been a drop in labor force participation. Between September 2007 and September 2014, the labor force participation rate has fallen by more than three percentage points, the steepest decline in the post-World War II era (*Figure 1-13*). Multiple factors have played a role in the decline. One factor involves the cyclical weakness in the labor market due to constrained job growth. The argument that follows is that jobless workers, in facing difficulties finding a job, become discouraged and leave the labor force, thus pushing down the unemployment rate and the participation rate. Other factors involve demographic and cultural shifts that are independent of the business cycle and are typically referred to as structural shifts or factors.

One well-known structural shift is the aging of the labor force. In part, this is a result of the aging of the baby boomers in recent years and the slow birth rate during the post baby-boom period. Because workers above the age of 54 have lower participation rates, the increase in the share of this age group by itself pushes down the aggregate participation rate. Other structural factors that may be impacting the participation rate include younger people staying in school longer and the number of people receiving disability payments.

Recent research at the Federal Reserve Bank of Philadelphia suggests that the primary reasons for the downward trend in the participation rate is due more to structural factors rather than cyclical factors. Fujita determines that about 65 percent of the decline in the participation rate from first-quarter 2000 through fourth-quarter 2013 is accounted for by retirement and disability. He notes that the increase in nonparticipation due to retirement occurred only after 2010, while nonparticipation due to disability steadily increased over the past 13 years. Similarly, he finds that nonparticipation due to schooling had been increasing and has been another significant contributor to the decline in the participation rate since 2000. Most importantly, perhaps, is his finding that 80 percent of the decline in the participation rate since first-quarter 2012 is due to retirement, rather than discouraged workers.[14]

[14] Fujita, Shigeru (2014). "On the Causes of Declines in the Labor Force Participation Rate." Federal Reserve Bank of Philadelphia Research Rap, February 6, 2014.

Other Federal Reserve researchers provide evidence that suggests much of the steep decline in the participation rate since 2007 is due to ongoing structural influences. Most prominently, they find the ongoing aging of the baby-boom generation into ages with traditionally lower attachment to the labor force can, by itself, account for nearly half of the decline.[15]

The degree to which the drop in labor force participation is due to cyclical influences versus structural trends is important in assessing the state of the labor market. Since evidence is mounting on the side of ongoing structural trends, the unemployment rate may be depicting a fairly accurate picture of the improvement of the labor market and a consequent decline in labor market slack.

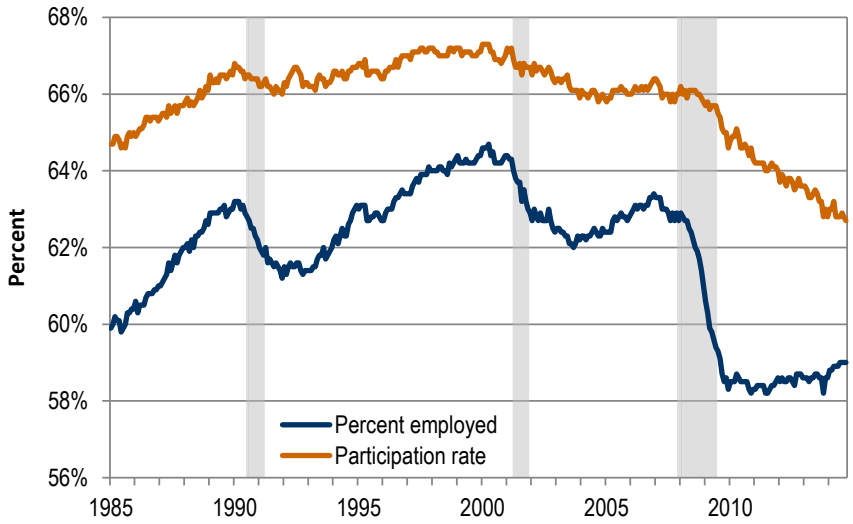
Figure 1-13 also shows the recent decline in a related measure: the employment population ratio, shown as percent employed. The labor force participation rate measures the number of people in the workforce – employed or seeking work – relative to the total number of working age people in the population. The employment population ratio measures the number of people employed relative to the total number of working age people in the population.

The employment population ratio can be similarly used to show how well the economy is performing. The employment population ratio and the employment level are, naturally, closely related. Movements in the employment level reflect net changes in the number of job holders, while movements in the ratio are net changes in the number of job holders relative to changes in the size of the population. As such, the ratio is less strongly dominated by the economy's long-term growth trend than is the simple count of job holders.

The employment population ratio declined markedly during the last recession as a result of the large number of jobs that were lost. It tended to remain mostly unchanged right after the recession, when monthly employment increased slowly, but has started to move higher with stronger employment growth that began in late 2013.

[15] Aaronson, Stephanie, T. Cajner, B. Fallick, F. Galbis-Reig, C. Smith, and W. Wascher. "Labor Force Participation: Recent Developments and Future Prospects." Federal Reserve Bank of Cleveland, September 2014.

Figure 1-13. Labor force participation rate and employment-to-population ratio, seasonally adjusted annualized rate
United States, January 1985 through September 2014
Source: U.S. Bureau of Labor Statistics, Current Population Survey



U.S. recessions are shaded in gray.

Even as unemployment rates are decreasing, more people are electing to leave or stay out of the labor force.

Chapter 2: Washington's economy and labor market

Economic events that affect and shape the national economy have very similar effects on state economies. States are connected economically through the free flow of commerce across state lines and through the mobility of labor. Consequently, national recessions and recoveries are typically experienced by all states, though the degree to which they are felt might differ between states.

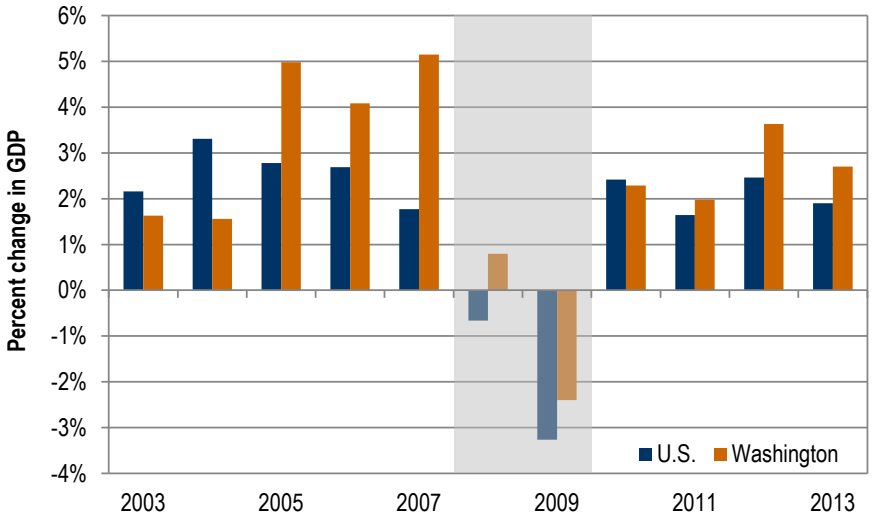
Washington's level of economic activity can be measured by the value of goods and services it produces at some point in time. This measure of state economic output, formerly known as gross state product and now known as state gross domestic product (GDP), is the sum of all value added by industries within the state. It is the counterpart to the nation's GDP.

The U.S. Bureau of Economic Analysis computes state GDP annually. Changes in state GDP can be used as a measure of state economic growth, much as changes in national GDP are used to measure national economic growth.

Washington state's economy, in terms of GDP, ranked 14th among all U.S. states and territories in 2013. Its GDP expanded by 2.7 percent in 2013 (*Figure 2-1*), which outpaced the 1.9 percent growth achieved by the nation. Washington state GDP experienced the same downturn during the last recession that occurred at the national level, although it was less pronounced. Washington's rate of economic growth, as measured by the change in state GDP, held up even as the nation's GDP began to decline heading into the recession.

Washington's GDP followed the U.S. GDP into decline in 2009 before moving back into positive territory in 2010 along with the national GDP. Washington's economy has outperformed the national economy the last three years.

Figure 2-1. U.S. and Washington state gross domestic product, (chained 2009 dollars), annual percent change, seasonally adjusted annualized rate
United States and Washington state, 2003 through 2013
Source: U.S. Bureau of Economic Analysis



U.S. recessions are shaded in gray.

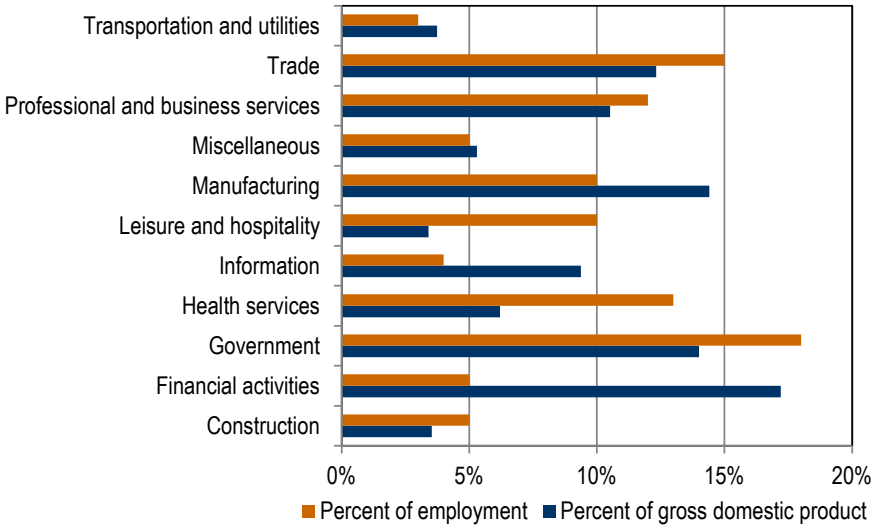
Washington's economy has grown faster than the national average the past three years.

Figure 2-2 shows the contributions each major industry made to state GDP and total nonfarm employment, respectively, in 2013.

In the private sector, financial activities made up the greatest portion of the state's GDP, followed by trade and manufacturing. Government made up the greatest portion of employment, but includes all of the public sector – that is, all federal, state and local government establishments that provide services to the general public (e.g., federal and state hospitals, federal and state agencies, and state and local schools).

Both the financial and information industries employed a relatively small proportion of workers relative to their contributions to state GDP. Since an industry's contribution to state GDP includes their employees' wages and salaries, these sectors tend to consist of higher-wage occupations than other industries and therefore make strong contributions to state GDP.

Figure 2-2. Percent of nonfarm employment and state gross domestic product by industry[16]
Washington state, 2013
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics, Current Employment Statistics; U.S. Bureau of Economic Analysis



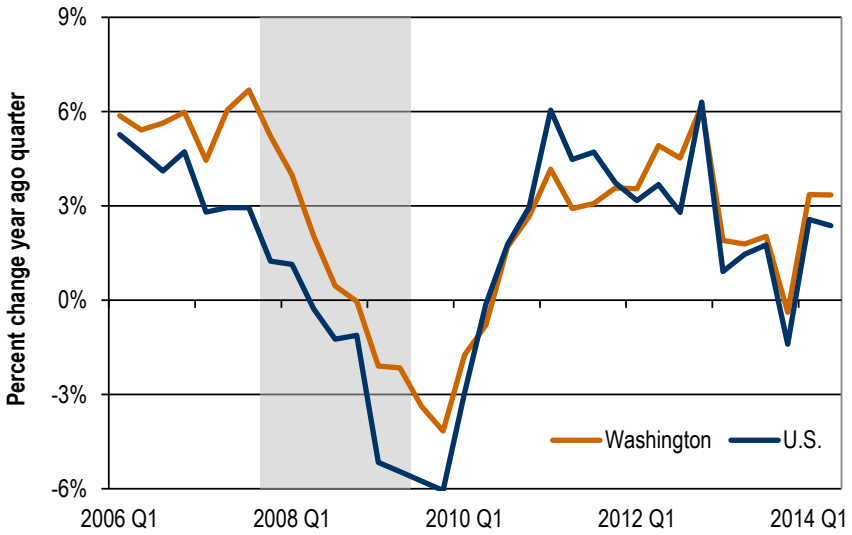
Financial activities represented the largest share of state GDP, but a much smaller share of employment, in 2013.

[16] In *Figure 2-2*, trade combines wholesale and retail trade. Miscellaneous consists of the remaining industries, including private educational services, mining and logging and the industry group known as "other services."

Personal income is gradually increasing

Personal income in Washington state increased during the recovery as economic activity and employment increased. Income growth in Washington overtook national income growth starting in 2012 (*Figure 2-3*). Personal income in Washington state rose by 3.4 percent from second-quarter 2013 to second-quarter 2014 compared to 2.4 percent nationally, adjusted for inflation.

Figure 2-3. Personal income, adjusted for inflation, percent change year ago quarter
United States and Washington state, first-quarter 2006 through second-quarter 2014
Source: U.S. Bureau of Economic Analysis, State Personal Income



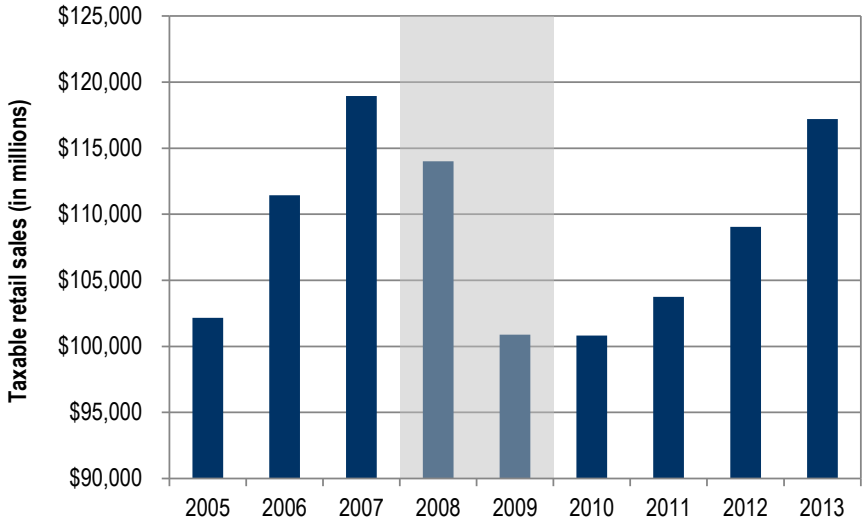
U.S. recessions are shaded in gray.

Washington's income growth has surpassed the nation since first-quarter 2012.

Income growth supported greater spending

Local consumer spending patterns are reflected in taxable retail sales. *Figure 2-4* shows how taxable sales were affected by the recession and the extent to which they are recovering after the recession. Annual sales receipts peaked in 2007 at about $119 billion right before the recession settled in. Their levels declined during the recession by roughly 15 percent from 2007 through 2010 before increasing in 2011, 2012 and 2013. Taxable retail sales in 2013 were roughly 1.5 percent off their peak in 2007.

Figure 2-4. Annual taxable retail sales, millions of dollars
Washington state, 2005 through 2013
Source: Washington State Department of Revenue



U.S. recessions are shaded in gray.

Retail sales have grown steadily since 2010 and are approaching 2007 levels.

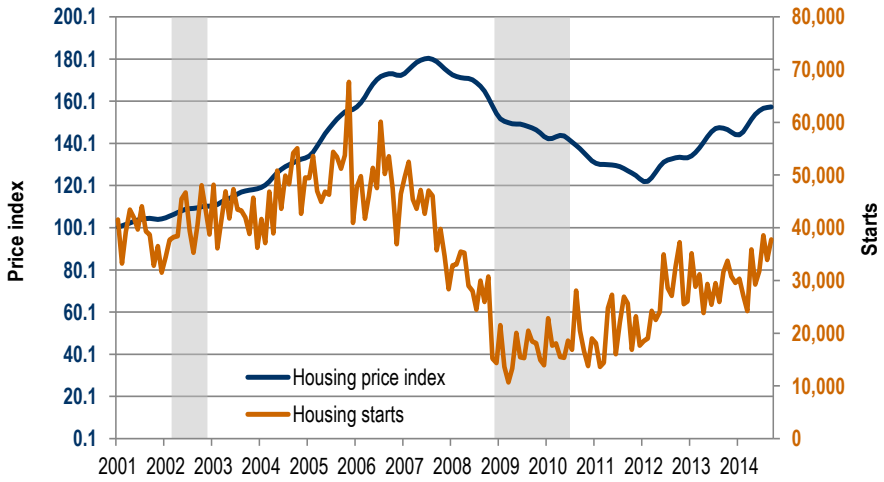
Washington housing market following national trend

Low interest rates, population growth and improving employment conditions are helping to revive household formation, although it remains well below the pre-recession levels. Household formation is the creation of a new household, which is simply defined as a group of individuals who live together, regardless of family structure. Household formation suggests more people getting jobs and getting apartments or perhaps getting married or having children, which then compels them to leave their shared housing arrangements.

The increase in mortgage rates during the second half of 2013 took some momentum away from the housing rebound in Washington state, although home prices continued to rebound solidly (*Figure 2-5*). Rising home prices are an important factor for sustaining the housing recovery. They serve as an indication that excess inventories are being sold, which then also bolsters the purchasing confidence of potential homebuyers.

Housing starts began improving during second-quarter 2014 and have continued picking up momentum into the fall. After falling by 12.0 percent in August, housing starts improved by 11.3 percent in September. Housing starts in September are up 19.4 percent from where they were one year ago.

Figure 2-5. Housing price index and housing starts, seasonally adjusted, December 2000 = 100
Washington state, January 2001 through September 2014
Source: Federal Home Loan Mortgage Corporation



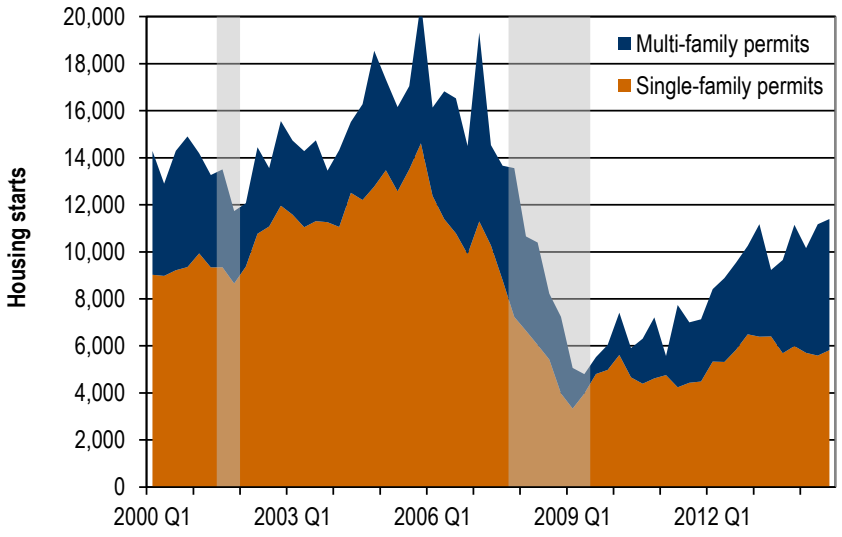
U.S. recessions are shaded in gray.

Housing prices have begun to rise and home building activity has followed.

Most residential activity has been aimed at construction of single-family units compared with multi-family residences (*Figure 2-6*). However, there has been a greater rebound in multi-family unit construction, including apartments and condominiums, after the recession. Apartment construction has been particularly strong within the state, with multi-family permits up 34.9 percent comparing the first three quarters or 2013 to those of 2014.

Some reasons for the shift toward apartment residency can be attributed to sluggish household formation and a lackluster job market, particularly among young adults. More young adults lived at home with an older family member during the recession, resulting in pent-up demand for apartment space.[17] Statistics at the national level help identify the lack of home buying by younger generations. Homeownership rates for individuals under age 35 have dropped significantly, tumbling 7.6 percentage points to 36 percent during third-quarter 2014 since peaking in June 2004.[18]

Figure 2-6. Residential building permits by type of unit, seasonally adjusted annualized rate
Washington state, first-quarter 2000 through third-quarter 2014
Source: U.S. Census Bureau, Building Permits Survey



U.S. recessions are shaded in gray.

Demand for multi-family units has increased since the recession, but single-family units remained most often built.

[17] See www.pewsocialtrends.org/2009/11/24/home-for-the-holidays-and-every-other-day/.
[18] Current Population Survey/Housing Vacancy Survey, Series H-111, U.S. Census Bureau.

Figure 2-7. Top 10 export commodities
Washington state, 2013
Source: U.S. Census Bureau, State Trade Data

Commodity	Millions of dollars, 2012	Percent share of state exports, 2012	Percent change, 2012 to 2013
Civilian aircraft, engines and parts	$42,572	52.1%	15.9%
Soybeans, not either specified or included	$4,638	5.7%	-15.3%
Oil (not crude) from petrol and bitumen mineral	$3,264	4.0%	41.9%
Wheat (other than durum wheat) and meslin	$2,456	3.0%	-3.1%
Light oils and prep (not crude) from petroleum	$1,091	1.3%	-10.0%
Coniferous wood in the rough, not treated	$1,076	1.3%	47.1%
Apples, fresh	$845	1.0%	2.4%
Corn (maize) other than seed corn	$835	1.0%	-49.4%
Potatoes, prepared etc., no vinegar, frozen	$763	0.9%	1.4%
Ultrasonic scanning apparatus	$666	0.8%	0.5%

Aerospace has dominated Washington's export market.

International trade, an important part of the state economy

Washington was the fourth-largest exporting state in the country in 2013 and maintained a positive trade balance, with the value of exports exceeding imports.[19] Aerospace, particularly commercial aircraft, made up the dominant share of the state's exports in terms of value (*Figure 2-7*). Agricultural commodities collectively comprised the next largest share of the state's exports, accounting for roughly 13 percent of total exports.

China largest destination for Washington state exports

The dollar value of exports from Washington has risen each year since 2010. From 2012 to 2013, they rose by roughly 6 percent. Washington's geographic orientation toward the Asian Pacific Rim, along with its coastal ports, provides a strong basis for international trade. The two largest economies in that region are China and Japan; together they account for close to 30 percent of Washington's export market (*Figure 2-8*).

[19] United States Census Bureau, State Trade Data.

Figure 2-8. Top 10 destination countries for Washington state exports, based on 2013 ranking
Washington state, 2010 through 2013
Source: U.S. Census Bureau, State Trade Data

	Millions of dollars					
Country	2010	2011	2012	2013	Percent share 2013	Percent change 2012 to 2013
China	$10,305	$11,236	$14,156	$16,713	20.5%	18.1%
Canada	$6,983	$8,551	$8,382	$8,995	11.0%	7.3%
Japan	$6,135	$6,467	$9,025	$7,037	8.6%	-22.0%
United Arab Emirates	$962	$2,753	$5,059	$3,870	4.7%	-23.5%
Mexico	$990	$1,372	$2,864	$3,198	3.9%	11.7%
South Korea	$2,695	$3,261	$3,384	$2,711	3.3%	-19.9%
Hong Kong	$1,041	$2,079	$2,152	$2,703	3.3%	25.1%
United Kingdom	$1,253	$2,017	$1,610	$2,702	3.3%	67.8%
Indonesia	$2,037	$1,588	$1,610	$2,290	2.8%	42.2%
India	$980	$662	$1,273	$2,221	2.7%	74.4%

China has consistently been the top trade destination for Washington exports.

Public-sector employment in Washington state starting to rebound

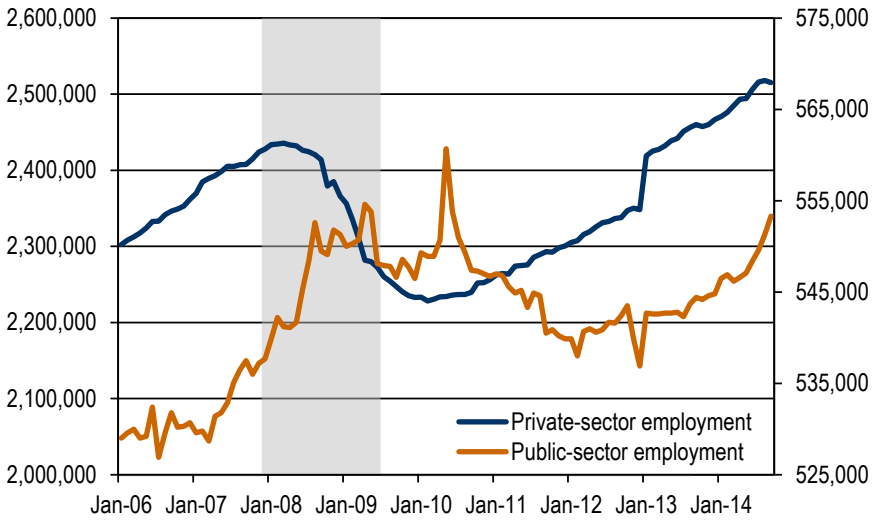
Washington's employment trends during the recession and recent recovery have been similar to what has been taking place at the national level (*Figure 1-10*). *Figure 2-9* shows the delay between when the private and public sectors began their respective recoveries. Employment in the private sector has been on an upward path since reaching its post-recession low in February 2010. Public-sector employment began increasing during the second half of 2013 after declining and leveling off after the recession. Government employment in September 2014 was just 1.3 percent below the peak that was reached in May 2010.

State and local revenues often decline in an economic downturn, leading to potential employment loss. Federal grants may help to offset these losses and, in this past recession, the American Recovery and Reinvestment Act of 2009 (also known as "the stimulus") directed unprecedented fiscal relief to states and localities. The stimulus helped to provide additional payments for highways and other infrastructure as well as education and unemployment benefits.[20] Once the stimulus funds were spent, employment losses accumulated. State tax collections have recently increased as private-

[20] "State and Local Budgets and the Great Recession," Gordon, Tracy, Brookings Institution, December 2012: www.brookings.edu/research/articles/2012/12/state-local-budgets-gordon.

sector employment conditions and spending patterns improved. This enabled state and local governments to increase public employment since September 2013 by 1.6 percent.

Figure 2-9. Total private- and public-sector nonfarm employment, seasonally adjusted Washington state, January 2006 through September 2014
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics, Current Employment Statistics



U.S. recessions are shaded in gray.

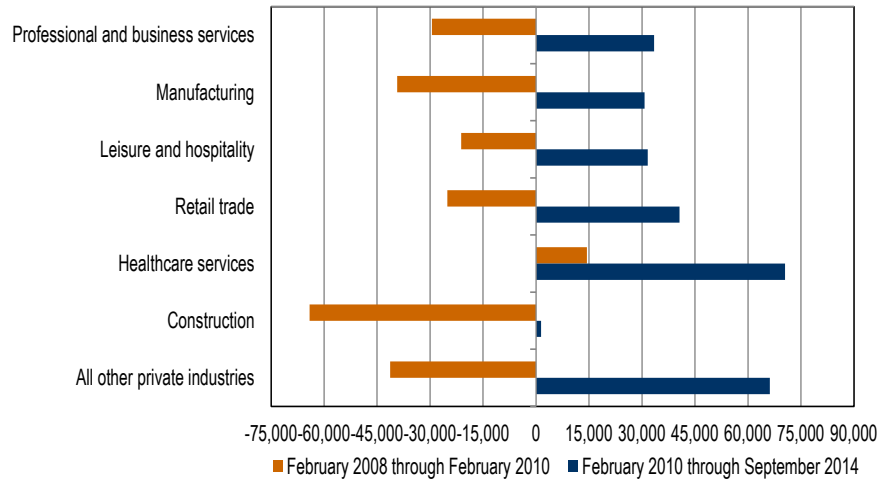
The employment recovery is now being felt in both the private and public sectors.

The data in *Figure 2-10* depict the extent of recovery in employment by industry since reaching a trough during the recession. In total, private-sector employment in November 2013 surpassed its previous peak reached in 2008. Private-sector employment in September 2014 was 79,600 more, or roughly 2.6 percent greater, than February 2008 levels. There are three similarities to what has taken place nationally:

- Professional and business services employment and leisure and hospitality employment gains have exceeded losses during the recession,
- Healthcare services employment did not fall during the recession and made greater gains during the recovery and
- Construction and manufacturing employment have been slower to recover.

The key differences were in retail trade and in all other private industries, where more jobs were added in both categories in Washington state than had been lost.

Figure 2-10. Change in private-sector employment by industry
Washington state, February 2008 through September 2014
Source: U.S. Bureau of Labor Statistics, Current Employment Statistics



Private-sector employment has been bouncing back with the exception of construction employment.

Seattle area has experienced strongest employment recovery

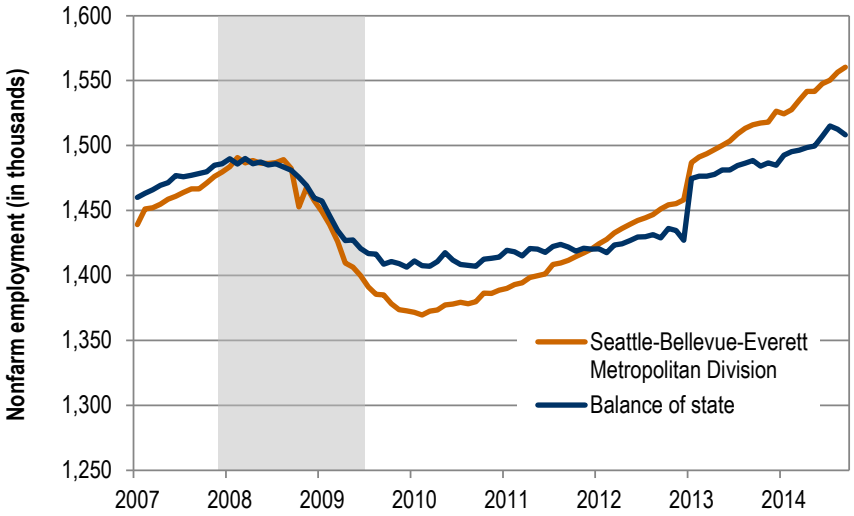
Figures 2-11 and *2-12* illustrate the extent to which the Seattle-Bellevue-Everett Metropolitan Division (King and Snohomish counties) has served as the economic center for job creation during the recovery period. This Metropolitan Division lost a greater number of jobs during the recession than the rest of the state as a whole. Since February 2010, however, nonfarm employment in the Seattle-Bellevue-Everett Metropolitan Division grew by 190,700 through September 2014. This signified an increase of 157 percent in employment since February 2010, compared with 129 percent in the rest of the state. A key driver behind the growth has been the aerospace industry, which has increased employment by 11,200 to offset the 3,900 jobs lost during the recession.

Figure 2-11. Total nonfarm employment change through recession and recovery, seasonally adjusted
Washington state, Seattle-Bellevue-Everett Metropolitan Division and balance of state, February 2008 through September 2014
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics, Current Employment Statistics

Area	Employment change February 2008 through February 2010	Employment change February 2010 through September 2014	Percent recovery in jobs lost
Seattle-Bellevue-Everett Metropolitan Division	-121,100	190,700	157%
Balance of state	-78,300	100,700	129%
Total for state	**-199,400**	**291,400**	**146%**

The Seattle-Bellevue-Everett Metropolitan Division has led in jobs recovery.

Figure 2-12. Monthly total nonfarm employment, in thousands, seasonally adjusted
Seattle-Bellevue-Everett Metropolitan Division and balance of state, January 2007 through September 2014
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics, Current Employment Statistics



U.S. recessions are shaded in gray.

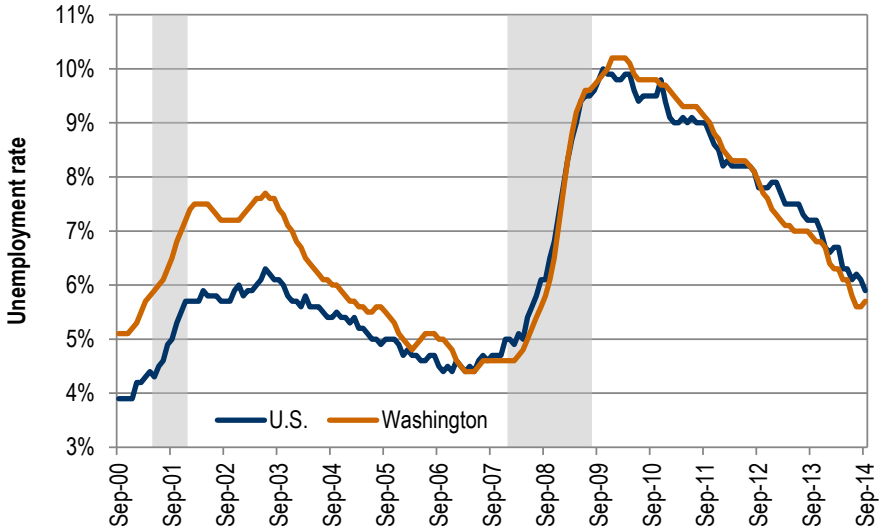
The state has continued to recover, with the Seattle-Bellevue-Everett Metropolitan Division area leading the way.

Washington state and U.S. unemployment rates converged

Historically, Washington state's unemployment rate has typically been higher than the national unemployment rate (*Figure 2-13*). As the nation and state began to enter the most recent recession, the two unemployment rates began to converge and have moved closely since then. The two rates remain close together, with Washington having a lower unemployment rate in September 2014 at 5.7 percent while the U.S. unemployment rate was at 5.9 percent.

The gap between the two unemployment rates began to close right before the recession, when Washington state's level of economic activity, as evidenced by its GDP growth, began to escalate relative to national GDP. This trend has largely continued through 2014 which has served to push Washington's unemployment rate below the national unemployment rate.

Figure 2-13. Monthly seasonally adjusted annualized unemployment rates
United States and Washington state, September 2000 through September 2014
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics



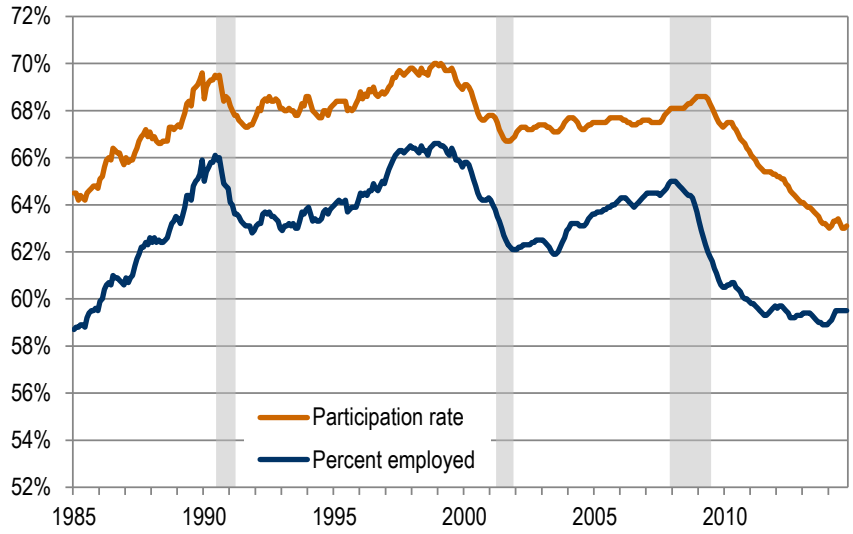
U.S. recessions are shaded in gray.

The Washington state unemployment rate has tracked closely with the national rate since the recession began.

Washington's employment growth during the recovery has been marginally better than the U.S. rate of growth over the same period, although the decline in the respective unemployment rates have followed the same pattern. As such, the rate of decline in the Washington state unemployment rate since the recession owes a lot to the decline that has been taking place in the state's labor force participation rate (*Figure 2-14*).

The decline in this measure, as well as the decline in the state's employment-to-population ratio, has taken place in a manner similar to that for the U.S. as a whole. The same sets of demographic forces are likely behind the decline in the labor force participation rate in Washington state and the U.S. Stronger employment growth in Washington state in 2014 has trimmed the degree of cyclical unemployment and enabled the employment-to-population ratio to gradually turn upward.

Figure 2-14. Labor force participation rate and employment-to-population ratio, seasonally adjusted annual rate
Washington state, January 1985 through September 2014
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics



U.S. recessions are shaded in gray.

The labor force participation rate and the percent of the population employed have declined during the recovery.

Chapter 3: Seasonal, structural and cyclical industry employment

The purpose of this chapter is to identify the prevailing factors in employment trends for different industries. The results are important for both a better understanding of the current employment trends and for practical applications related to job placement, unemployment benefits and training programs. For instance, for industries with a high level of seasonality, significant variation in employment could be expected during the year and short-term high job demand would follow employment declines. For industries with high cyclical variation, periods of employment booms could be followed by periods of decline and training programs should be developed in anticipation of such variations.

Based on historical employment data from January 1990 through December 2013,[21] industries were categorized by the following:

1. Seasonal: regular and predictable employment changes that recur each calendar year, caused by seasonal factors which can include natural factors (changes in weather), administrative measures (starting and ending of the school year) and social, cultural or religious traditions (fixed holidays such as New Year's Day).

2. Cyclical: employment changes attributed to the business cycle in general, or specific events such as the housing bubble bursting in 2007.

3. Trend: shifts in long-term employment growth trends driven by fundamental structural change and productivity trends in industries, rather than the cyclical fluctuations in employment. Structural changes in employment can be initiated by productivity improvement, policy changes or permanent changes in resources, technology or society. Technological innovation has introduced entirely new industries and caused other industries to decline. It also has reshaped the entire labor market through increased efficiencies, such as automated manufacturing, data collection and analysis and communications.

4. Irregular: employment changes driven by one-time events, such as a labor strike or destructive weather.

[21] Historical data for employment covered by the unemployment insurance system was categorized by NAICS (North American Industrial Classification System) code, at the 3-digit code level with some 4-digit level detail (aerospace product and parts manufacturing, ship and boat building, software publishers and wired and wireless telecommunications carriers). Private- and public-education services employment data were combined under the education and health services industry category. Private- and public-employment data were also combined under the postal services and boat-building industries. The remainder of public-sector employment was aggregated and categorized by ownership (federal, state and local government). Three industries were excluded from the analysis due to data limitations and/or significant code changes: oil and gas extraction, rail transportation and internet publishing and broadcasting. Altogether, the historical time series data included 97 industries and one series for total employment.

Seasonal industries

Based on an analysis of 97 industries in Washington state, 15 industries were identified as having high levels of seasonality, with a seasonal factor over 4 percent. Crop production, scenic and sightseeing transportation, and support activities for agriculture and forestry were the three most seasonal industries in Washington state (*Figure 3-1*).

Figure 3-1. Industries with high levels of seasonality
Washington state, 1990 through 2013
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

NAICS	Industry	Seasonal factor
111	Crop production	34.0%
487	Scenic and sightseeing transportation	16.0%
115	Support activities for agriculture and forestry	14.7%
237	Heavy and civil engineering construction	9.0%
711	Performing arts, spectator sports and related industries	8.7%
114	Fishing, hunting and trapping	8.0%
213	Support activities for mining	7.8%
721	Accommodation, including hotels and motels	5.8%
311	Food manufacturing	4.9%
611	Educational services	4.8%
448	Clothing and clothing accessories stores	4.6%
713	Amusement, gambling and recreation industries	4.5%
512	Motion picture and sound recording industries	4.4%
312	Beverage and tobacco product manufacturing	4.4%
492	Couriers and messengers	4.1%

Crop production, scenic and sightseeing transportation, and support activities for agriculture and forestry have been the industries with the highest degree of seasonality in Washington state.

Structural and cyclical industries

There were 21 industries where the structural (trend) component accounted for at least 50 percent of the change in employment (*Figure 3-2*). Software publishers, ambulatory healthcare services and the wholesale electronic markets and agents and brokers industries were the most highly influenced.

Figure 3-2. Industries most influenced by structural factors
Washington state, 1990 through 2013
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

NAICS	Industry	Structural factor
5112	Software publishers	68.6%
621	Ambulatory healthcare services	63.7%
425	Wholesale electronic markets and agents and brokers	60.7%
454	Nonstore retailers	58.1%
453	Miscellaneous store retailers	57.9%
532	Rental and leasing services	57.7%
238	Specialty trade contractors	56.7%
622	Hospitals	56.3%
930	Local government, excluding education and hospitals	55.9%
624	Social assistance	55.8%
611	Educational services	55.2%
812	Personal and laundry services	54.7%
722	Food services and drinking places	54.7%
423	Merchant wholesalers, durable goods	54.4%
541	Professional, scientific and technical services	53.5%
323	Printing and related support activities	53.1%
623	Nursing and residential care facilities	52.1%
814	Private households	51.7%
561	Administrative and support services	51.3%
511*	Other publishers	50.6%
333	Machinery manufacturing	50.4%

*Includes publishing industries (except internet) without software publishers.

These Washington industries have been most influenced by structural factors such as technology changes, policy changes and changing demographics.

For 17 industries the cyclical component accounted for at least 70 percent of the change in employment (*Figure 3-3*). Scenic and sightseeing transportation, support activities for mining, and crop production were the most highly influenced.

Figure 3-3. Industries most influenced by cyclical factors
Washington state, 1990 through 2013
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

NAICS	Industry	Cyclical factor
487	Scenic and sightseeing transportation	84.8%
213	Support activities for mining	83.2%
111	Crop production	81.5%
112	Animal production	78.1%
486	Pipeline transportation	75.3%
711	Performing arts, spectator sports and related industries	73.6%
324	Petroleum and coal products manufacturing	73.6%
483	Water transportation	73.6%
446	Health and personal care stores	73.2%
316	Leather and allied product manufacturing	72.4%
221	Utilities	71.8%
114	Fishing, hunting and trapping	70.8%
512	Motion picture and sound recording industries	70.8%
313	Textile mills	70.3%
443	Electronics and appliance stores	70.3%
115	Support activities for agriculture and forestry	70.2%
515	Broadcasting (except internet)	70.1%

These Washington industries have been most sensitive to cyclical movements and have exhibited shifts of relatively rapid employment growth and decline.

See *Appendix 2* for a description of the statistical methodology used to categorize and measure the major factors behind employment change by industries and *Figure A2-1* with the full results of these analyses.

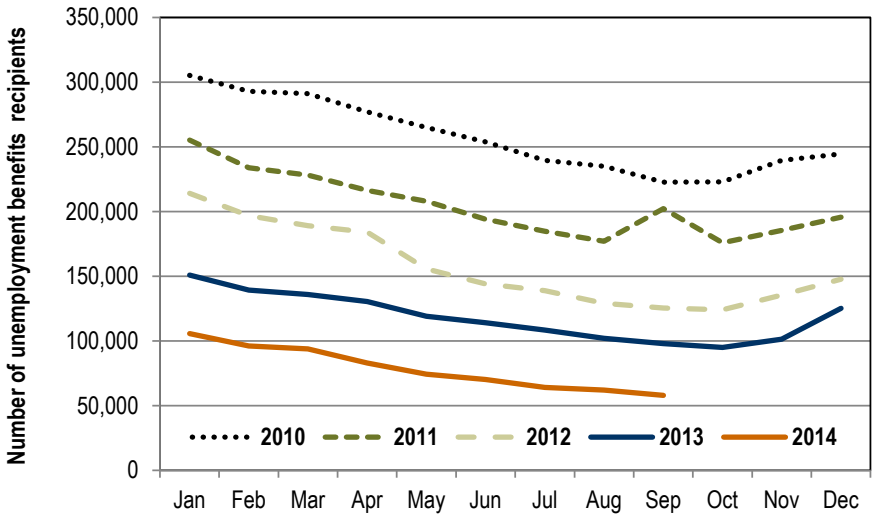
Chapter 4: Unemployment

This chapter discusses three important indicators of Washington's labor market: unemployment benefits, the unemployment rate and mass layoffs.

Unemployment benefits

In September 2014, nearly 58,000 people received unemployment benefits. *Figure 4-1* shows that the number of beneficiaries in September 2014 decreased by 81 percent from a peak of just over 300,000 in January 2010. The drop in beneficiaries reflects factors including: individual beneficiaries finding jobs, fewer people being laid off and needing to apply for benefits and beneficiaries exhausting all of their unemployment benefits.

Figure 4-1. Unemployment benefits recipients by month, all benefits[22]
Washington state, January 2010 through September 2014
Source: Employment Security Department/LMPA, Unemployment Insurance Data Warehouse



The number of people receiving unemployment benefits has been steadily declining since January 2010.

[22] For the purpose of this report, all benefits include regular unemployment benefits, emergency unemployment compensation and extended benefits.

Duration of unemployment benefits

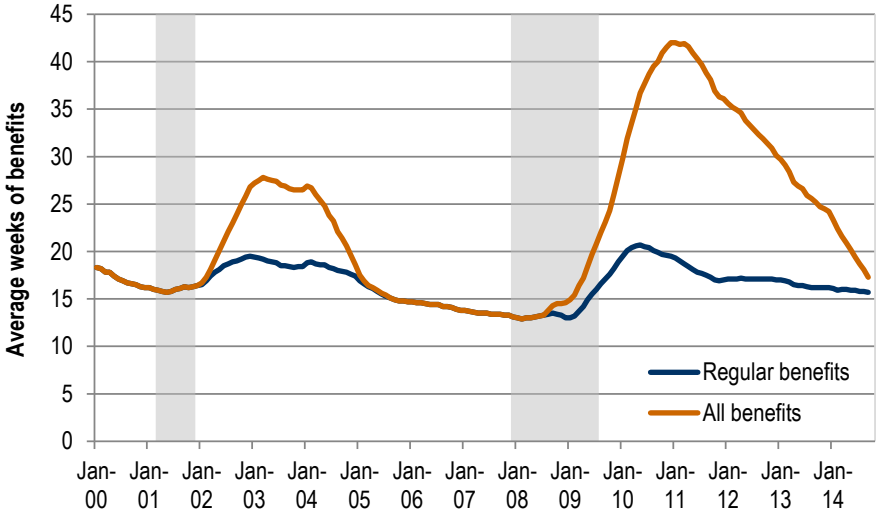
Typically, workers covered by unemployment insurance can receive up to 26 weeks of regular unemployment benefits in a 52-week benefit year. The 52-week benefit year begins when an individual applies for unemployment benefits.

More weeks of unemployment benefits were available after the recession

Because of the unusually steep loss of jobs during the Great Recession, additional weeks of federally funded unemployment benefits were made available to unemployed workers after they used all of their regular unemployment benefits. At one point, claimants could receive up to a total of 99 weeks of benefits – 26 weeks of regular benefits, 53 weeks of emergency unemployment compensation and 20 weeks of extended benefits. Federal extensions have been phased out during the recovery. As of September 2014, claimants could receive up to 26 weeks of regular benefits.

The impact of these additional weeks of benefits is evident in the average duration (number of weeks) of benefits received. Average duration is calculated over a twelve-month period, comparing the number of weeks claimed to the number of first payments. *Figure 4-2* compares the average duration of benefits in Washington state for those who were receiving only regular benefits (up to 26 weeks) to the duration of all benefits, including the emergency unemployment compensation and extended benefits.

Figure 4-2. Average duration of regular unemployment benefits compared to all benefits
Washington state, January 2000 through September 2014
Source: Employment Security Department/LMPA, Unemployment Insurance Data Warehouse



U.S. recessions are shaded in gray.

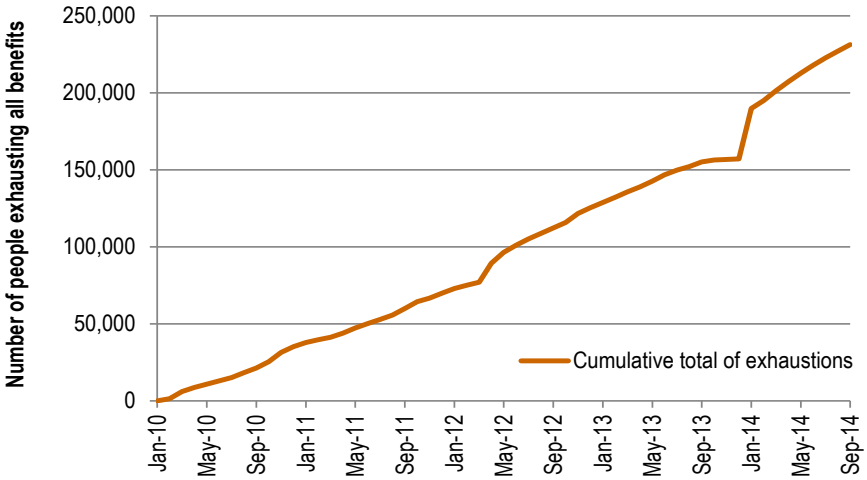
The number of weeks claimants received benefits has decreased from the post-recession peak.

The average duration for regular benefits peaked in May 2010 at 20.7 weeks. Average duration for all benefits reached a peak in December 2010 at 42.0 weeks. Since the start of 2011, both the average duration of regular and all benefits has been decreasing. As of September 2014, the average duration for regular benefits was 15.7 weeks.

More people have exhausted all benefits

Unemployed individuals exhaust their benefits when they have received all regular, emergency and extended benefits available to them. *Figure 4-3* shows the monthly cumulative total of exhaustions for Washington emergency unemployment compensation since the program was implemented in July 2008. Extended benefits then began in February 2009. As of September 2014, 231,393 people had used all of their available unemployment benefits – regular, emergency and extended benefits.

Figure 4-3. Number of people exhausting all unemployment benefits since emergency and extended unemployment programs began
Washington state, January 2010 through September 2014
Source: Employment Security Department/LMPA, Unemployment Insurance Data Warehouse



As of September 2014, about 231,000 people had exhausted all of their unemployment benefits since the recession began.

Benefits exhaustions by industry, occupation and area

Higher levels of benefits exhaustion are generally associated with long-term unemployment. The following figures detail patterns of benefits exhaustion by industry, occupation and location.

Exhaustions by industry

Figure 4-4 presents exhaustions by industry for the 12 months ending in September 2014. To provide further context, the figure also includes each industry's percent of total covered employment[23] and exhaustion-

[23] Covered employment is the number of workers employed by employers subject to Washington state's unemployment insurance taxes. The main exclusions are employment covered by the Railroad Retirement Act, self-employment and unpaid family workers.

to-employment ratio. The exhaustion-to-employment ratio can be used to identify industries characterized by long-term unemployment and that continue to struggle in their recovery from the recent recession.

From October 2013 through September 2014, the construction industry accounted for the greatest portion of exhaustions, at 13.6 percent. The construction industry's share of total covered employment was 4.7 percent and the exhaustion-to-employment ratio was 2.9. Manufacturing had the second-largest portion of exhaustions, at 10.9 percent, followed by healthcare and social assistance at 9.3 percent

Figure 4-4. Unemployment benefits exhaustions by industry, all benefits
Washington state, October 2013 through September 2014
Source: Employment Security Department/LMPA, Unemployment Insurance Data Warehouse

NAICS	Industry sector	Annual exhaustions, all benefits	Percent of all exhaustions	Industry share of covered employment	Exhaustions to employment ratio
11	Agriculture, forestry, fishing and hunting	2,544	3.0%	3.2%	0.9
21	Mining	177	0.2%	0.1%	2.9
22	Utilities	218	0.3%	0.2%	1.6
23	Construction	11,555	13.6%	4.7%	2.9
31 - 33	Manufacturing	9,286	10.9%	1.5%	7.1
42	Wholesale trade	4,078	4.8%	9.6%	0.5
44 - 45	Trade	7,546	8.9%	8.0%	1.1
48 - 49	Transportation and warehousing	2,494	2.9%	4.5%	0.7
51	Information	2,754	3.2%	4.2%	0.8
52	Finance and insurance	3,184	3.7%	11.0%	0.3
53	Real estate, rental and leasing	1,687	2.0%	2.8%	0.7
54	Professional, scientific and technical services	5,144	6.0%	3.6%	1.7
55	Management of companies and enterprises	234	0.3%	3.0%	0.1
56	Admin. and support and waste mgmt. and remediation svcs.	6,830	8.0%	1.5%	5.3
61	Educational services	1,609	1.9%	5.8%	0.3
62	Healthcare and social assistance	7,933	9.3%	1.3%	7.1
71	Arts, entertainment and recreation	1,429	1.7%	4.9%	0.3
72	Accommodation and food services	3,566	4.2%	1.3%	3.3
81	Other Services (except public administration)	2,273	2.7%	11.3%	0.2
GOV	Government (excluding education services)	5,240	6.2%	17.5%	0.4
	Unknown	5,284	6.2%	N/A	N/A
	Total	**85,065**	**100.0%**		

Construction and manufacturing industry workers were most likely to exhaust unemployment benefits from October 2013 through September 2014.

Exhaustions by occupation

Figure 4-5 examines unemployment benefits exhaustions by occupation. Administrative support, construction and management occupations combined for 38.5 percent of all exhaustions. Since total covered employment is reported only by industry and not by occupation, each occupation's percent of total covered employment and exhaustion-to-employment ratio were not available to be included in *Figure 4-5*.

Figure 4-5. Unemployment benefits exhaustions by major occupational groups, all benefits
Washington state, October 2013 through September 2014
Source: Employment Security Department/LMPA, Unemployment Insurance Data Warehouse

SOC	Major occupation group	Annual exhaustions, all benefits	Percent of all exhaustions
43	Office and administrative support occupations	11,726	13.8%
47	Construction and extraction occupations	11,116	13.1%
11	Management occupations	9,879	11.6%
51	Production occupations	7,196	8.5%
41	Sales and related occupations	5,959	7.0%
53	Transportation and material moving occupations	4,910	5.8%
	Unknown	3,862	4.5%
49	Installation, maintenance and repair occupations	3,547	4.2%
13	Business and financial operations occupations	3,260	3.8%
35	Food preparation and serving related occupations	3,046	3.6%
45	Farming, fishing and forestry occupations	2,520	3.0%
39	Personal care and service occupations	2,233	2.6%
15	Computer and mathematical occupations	2,213	2.6%
17	Architecture and engineering occupations	1,895	2.2%
37	Building and grounds cleaning and maintenance occupations	1,714	2.0%
31	Healthcare support occupations	1,684	2.0%
29	Healthcare practitioners and technical occupations	1,668	2.0%
27	Arts, design, entertainment, sports and media occupations	1,411	1.7%
55	Military specific occupations	1,117	1.3%
33	Protective service occupations	1,114	1.3%
25	Education, training and library occupations	895	1.1%
21	Community and social services occupations	805	0.9%
19	Life, physical and social science occupations	796	0.9%
23	Legal occupations	499	0.6%
	Total	**85,065**	**100.0%**

Unemployed workers in office and administrative support, construction and management occupations were most likely to exhaust unemployment benefits from October 2013 through September 2014.

Exhaustions by location of residence

Figure 4-6 shows exhaustions by workforce development area (WDA) for October 2013 through September 2014. A WDA map of the state is provided in *Appendix 1*. The Seattle-King, Pierce and Snohomish WDAs are the largest in the state in terms of population and have had the largest numbers of unemployed workers throughout the recent recession and recovery. Collectively, they accounted for 48.8 percent of all exhaustions. The Seattle-King WDA had more than twice the number of exhaustions observed in either the Pierce or Snohomish WDAs. The lowest level of exhaustions occurred in the Eastern WDA.

Figure 4-6. Unemployment benefits exhaustions by major occupational groups, all benefits
Washington state, October 2013 through September 2014
Source: Employment Security Department/LMPA, Unemployment Insurance Data Warehouse

Workforce development area	Annual exhaustions, all benefits	Percent of exhaustions
Seattle-King County	22,051	25.9%
Pierce County	10,604	12.5%
Snohomish County	8,822	10.4%
Out of state	7,407	8.7%
Pacific Mountain	6,164	7.2%
Spokane County	5,001	5.9%
South Central WA	4,682	5.5%
Southwest WA	4,537	5.3%
Northwest WA	4,450	5.2%
Benton-Franklin	3,611	4.2%
Olympic	3,278	3.9%
North Central WA	3,019	3.5%
Eastern WA	1,439	1.7%
Total	**85,065**	**100.0%**

Areas containing higher populations accounted for more exhaustions of unemployment benefits.

Unemployment rate

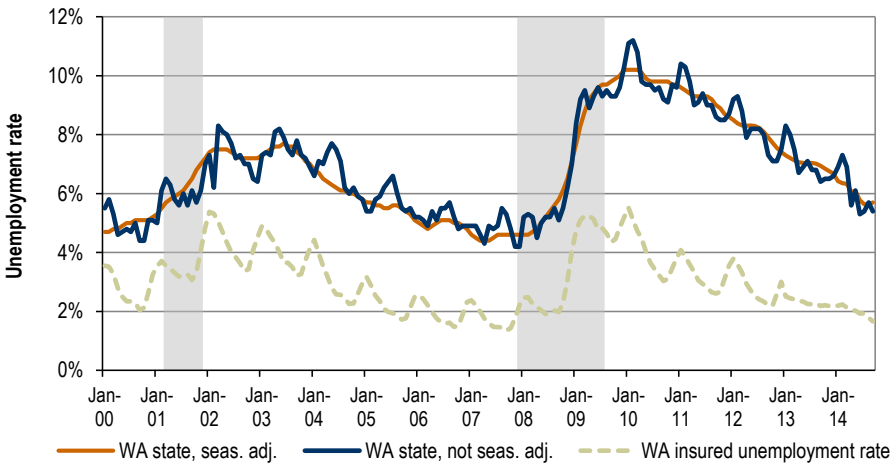
The overall unemployment rate is a ratio of the estimated number of unemployed individuals looking for work divided by the civilian labor force. The labor force is made up of individuals who are employed or who are actively seeking work. This is the most familiar unemployment rate and includes both workers covered by unemployment insurance and those who are not.[24]

[24] Covered employment is the number of workers by employers subject to Washington state unemployment insurance taxes. The main exclusions are employment covered by the Railroad Retirement Act, self-employment and unpaid family workers.

Particularly in the context of a discussion about unemployment benefits, the insured unemployment rate can be useful. The insured unemployment rate is a ratio of the number of insured unemployed (those drawing unemployment benefits) divided by the total number of individuals (working and not working) covered by unemployment insurance

Figure 4-7 compares the overall and insured unemployment rates for Washington. The rates have basically moved in tandem, with the insured rate historically about half the overall unemployment rate. In late 2008, both measures of unemployment began a dramatic rise, with rates peaking in late 2010. However, since 2009, the gap between the overall and insured unemployment rates has widened. This means there were increasing numbers of unemployed workers not eligible for unemployment benefits than historically has been the case.

Figure 4-7. Overall unemployment rate, seasonally and not seasonally adjusted and insured unemployment rate
Washington state, January 2000 through September 2014
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics



U.S. recessions are shaded in gray.

The gap between unemployed workers who are eligible for unemployment benefits and those who are not widens following recent recessions.

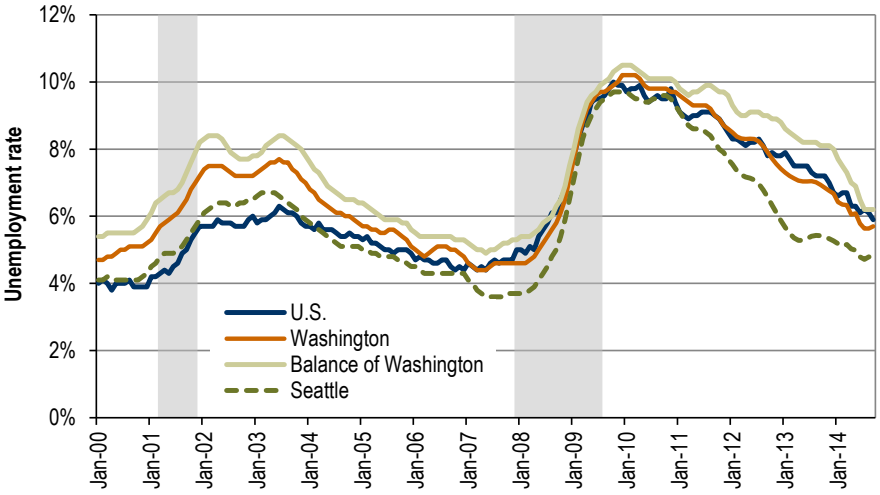
The overall unemployment rate

The overall unemployment rate is widely used in economic analysis as a lagging indicator of the direction of the economy. As noted previously, the unemployment rate is a ratio of the estimated number of unemployed who are seeking work, divided by the labor force. The labor force is limited to individuals who are employed or seeking work.

As shown in *Figure 4-8*, the state unemployment rate peaked in first-quarter 2010. During most of 2010, 2011 and 2012, the unemployment rate for Washington state remained higher than the national rate. Starting in October 2012, the state unemployment rate fell below the national rate and stayed below the national rate through September 2014. From October 2012 through September 2014, the state and the national unemployment rates have both declined by 2.0 percent.

The Seattle-Bellevue-Everett Metropolitan Division (MD) has reported a lower unemployment rate than the rest of Washington and the nation since 2004. Since October 2012 the percent decline in the Seattle-Bellevue-Everett MD unemployment rate has lagged the balance of the state. From October 2012 through September 2014 the unemployment rate for the MD declined by 1.5 percent. This compares to a decline of 2.7 percent for the balance of the state and a 2.0 percent decline for nation.

Figure 4-8. Historical unemployment rates, seasonally adjusted
United States and Washington state, January 2000 through September 2014
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics; National Bureau of Economic Research



U.S. recessions are shaded in gray.

National and state unemployment rates tracked closely during the recent recession. From October 2012 through September 2014, the state unemployment rate declined more rapidly than the Seattle rate.

Other measures of unemployment and employment

Other measures of employment and unemployment include alternative unemployment rates, the labor force participation rate and the employment rate.

Alternative unemployment rates

The U.S. Bureau of Labor Statistics (BLS) reports six alternative measures of labor underutilization, or unemployment. The commonly used definition of the unemployment rate, shown in *Figure 4-8*, is a ratio of the estimated number of unemployed, who are seeking work, divided by the labor force. This is equivalent to what BLS calls "U-3." A common criticism of the standard measurement of unemployment is that it is too narrow – for instance, it excludes individuals who are not working, would like to work, but have given up looking for work.

In response to criticism, BLS has made available alternative measurements that are progressively more inclusive than the commonly reported unemployment rate. Three of the six alternative measurements are defined as:

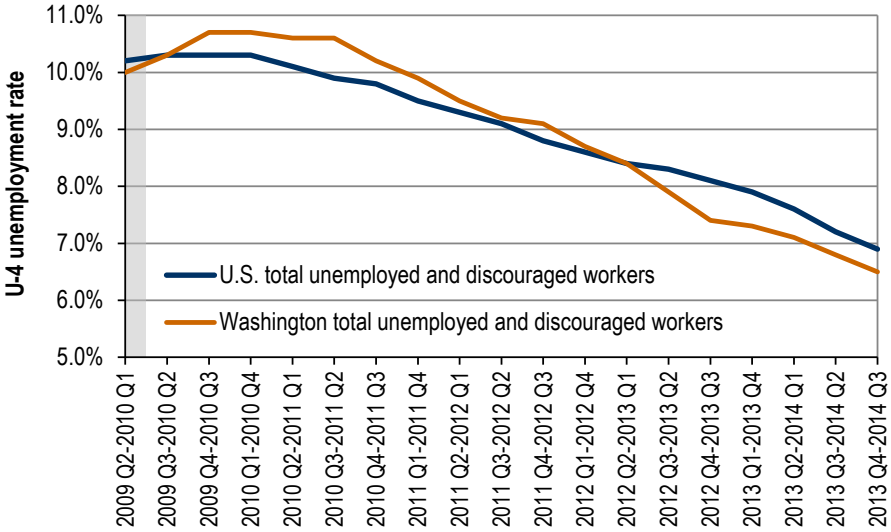
- U-3 – Unemployed as a percent of the labor force.
- U-4 – Unemployed plus discouraged workers, as a percent of the labor force plus discouraged workers.[25]
- U-6 – Unemployed plus all marginally attached workers and employees working part-time involuntarily, all as a percent of the labor force plus all marginally attached workers.[26]

The U-4 measure rose faster and remained higher in Washington state than for the country as a whole as a result of the recent recession (*Figure 4-9*). The moving average for third-quarter 2009 to second-quarter 2010 had the state and the nation both at 10.3 percent. From fourth-quarter 2011 to third-quarter 2012, the Washington state rate decreased to 9.1 percent, while the nation's rate has decreased to 8.9 percent. This indicates that relatively more Washington residents gave up looking for work and dropped out of the labor force.

[25] Discouraged workers have given a job-market related reason for not currently looking for work.

[26] Persons marginally attached to the labor force are those who currently are neither working nor looking for work but indicate that they want and are available for a job and have looked for work sometime in the past 12 months. Discouraged workers are a subset of this group.

Figure 4-9. U-4 unemployment rate (includes discouraged workers), four-quarter moving average
United States and Washington state, second-quarter 2009 through third-quarter 2014
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics

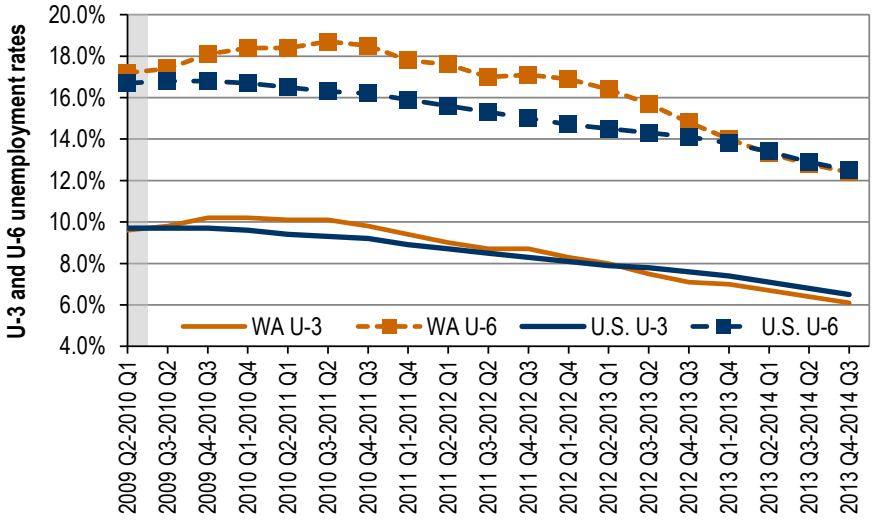


U.S. recessions are shaded in gray.

The U-4 measure of unemployment has been declining throughout the recovery. Washington state's U-4 is currently 6.5 percent and the U.S. is at 6.9 percent

U-6 is the broadest measure of unemployment. The widened gap between the U-6 and U-3 rates demonstrates that the ranks of discouraged workers, marginally attached workers and those working part time involuntarily have risen even more dramatically than the number of unemployed (*Figure 4-10*). This holds true for the state of Washington, where the majority of underutilized workers are in the employed part time involuntarily category. Washington's U-6 four-quarter moving average remained higher than the nation's from second-quarter 2009 until first-quarter 2013. It remained 0.1 percent below the national rolling average from fourth-quarter 2013 through third-quarter 2014.

Figure 4-10. U-3 (standard) and U-6 (includes marginally attached workers and those working part time involuntarily) unemployment rates, four-quarter moving average
United States and Washington state, second-quarter 2009 through third-quarter 2014
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics, Current Population Survey, Local Area Unemployment Statistics



U.S. recessions are shaded in gray.

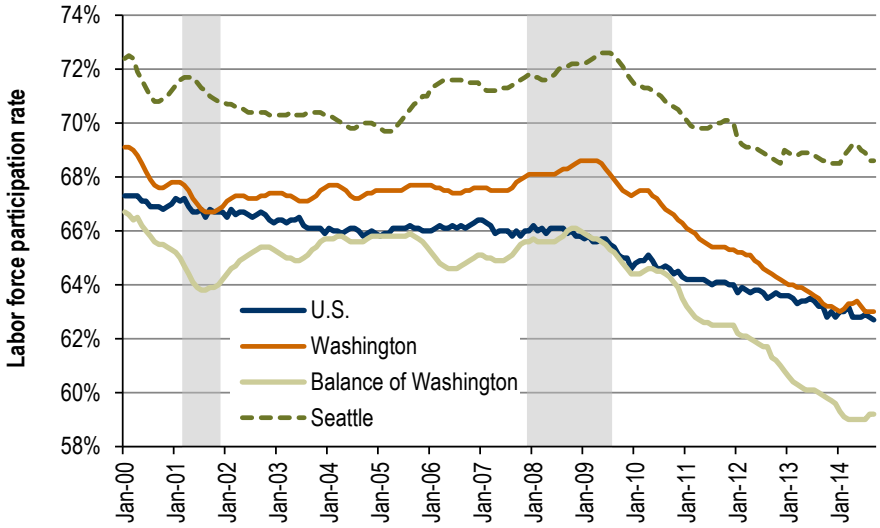
The most broadly defined U-6 measure of unemployment for Washington recently dropped below the national rolling average.

Labor force participation rate

The labor force participation rate (LFPR) is the ratio of the labor force divided by the total non-institutionalized, civilian population aged 16 and older. A higher participation rate means that a larger percent of a given population is either working or seeking work. A decline could be caused by increasing numbers of people going back to school, people migrating out of state or an increase in retirements.

Since the end of the 2001 recession, both the Washington state and the Seattle area labor force participation rates have been higher than the U.S. rate. Historically, the Seattle area has had a higher labor force participation rate than the state and nation. The average U.S. seasonally adjusted labor participation rate from July 2009 through September 2014 was 63.9 percent. During this time, the state averaged 65.1 percent, Seattle averaged 69.8 percent and the balance of the state averaged 61.9 percent (*Figure 4-11*).

Figure 4-11. Labor force participation rate, seasonally adjusted
United States and Washington state, January 2000 through September 2014
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics



U.S. recessions are shaded in gray.

Labor force participation rates have all been on the decline since the recent recession, especially outside of the Seattle-Bellevue-Everett MD, but small signs of improvement have appeared.

Mass layoff and dislocated workers reports discontinued

The Mass Layoff Statistics (MLS) program was a federal-state cooperative program that collected data on mass layoffs for establishments having at least 50 initial unemployment claims within a five-week period. The program was used to help identify distressed areas and distressed industries in the state. It was also used as a resource to help identify areas and industries with dislocated workers following plant closures or mass layoffs.

In 2013 as part of federal spending cuts (commonly referred to as "sequestration"), the U.S. Bureau of Labor Statistics (BLS) eliminated the MLS program. The last published data for Washington state covered first-quarter 2013. Consequently we are unable to provide more current data on dislocated workers, mass layoffs and plant closures in this publication.

Chapter 5: Employment projections

This chapter provides information on the Employment Security Department's short-, medium- and long-term industry and occupational employment projections, with a focus on the medium- (5-year) and long-term (10-year) projections.[27]

Industry and occupational employment projections provide a general outlook for Washington state. They are used by policymakers, job seekers, training providers, economic analysts and others. While the projections may not provide a complete picture of Washington's future labor market, they do provide a reasonably plausible view about Washington industry and occupational employment in the future.

We first produce industry forecasts for 2-, 5- and 10-year time horizons. The occupational staffing pattern for each industry is used to convert industry projections into occupational projections. Occupational projections show how many job openings are expected due to overall growth as well as replacement or churn. Total openings from occupational projections do not represent total demand, but can be used as an indicator of demand.

The base period for short-term projections is second-quarter 2013 and the base period for medium- and long-term projections is 2012.[28]

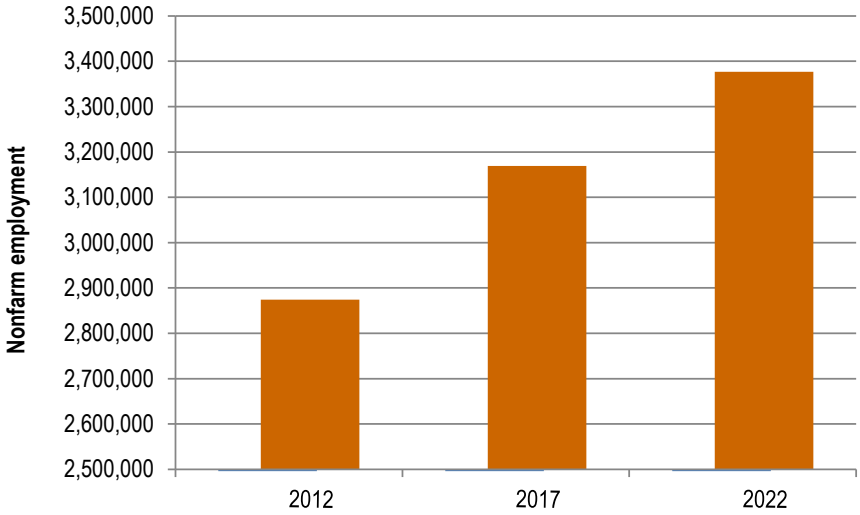
[27] More detailed information can be found in the 2013 Employment Projections report at: https://fortress.wa.gov/esd/employmentdata/docs/industry-reports/employment-projections-2014.pdf.

[28] Due to some differences in non-covered employment (which is used for benchmarking) and the way non-economic code changes are handled, the base numbers used for projections could be slightly different from those published in the Current Employment Statistics (CES) estimates.

Industry employment projections

Total nonfarm industry employment in Washington state is projected to reach about 3.17 million jobs by 2017 and about 3.38 million jobs by 2022 (*Figure 5-1*).

Figure 5-1. Base and projected nonfarm industry employment
Washington state, 2012, 2017 and 2022
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics



Nonfarm employment in Washington is expected to reach 3.17 million jobs by 2017 and 3.38 million jobs by 2022.

Washington state is projected to have an estimated 294,600 net new nonfarm jobs from 2012 through 2017 with an average annual growth rate of 2.0 percent. This growth rate is larger than the growth rate of 1.8 percent projected for the state for 2011 through 2016. The state is projected to have an estimated 502,400 net new nonfarm jobs from 2012 through 2022 with an average annual growth rate of 1.6 percent. This growth rate is larger than the growth rate of 1.5 percent projected for the state for 2011 through 2021.

Figure 5-2 provides 2012 base and 2017 employment projections by industry, along with the base and projected shares of employment by industry for Washington state.

Total employment in the professional and business services sector is projected to increase the most (0.9 percentage points). Employment in state and local government (excluding education) is projected to decrease the most (-0.6 percentage points). By 2017, construction's share is projected to increase to 5.6 percent, for a gain of 0.7 percentage points, which is indicative of the partial recovery of the construction sector from the recession.

Figure 5-2. Base and projected nonfarm employment by industry
Washington state, 2012 and 2017
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics

NAICS	Industry sector	Estimated employment 2012	Estimated share of employment in 2012	Projected share of employment in 2017	Percentage point change in employment share 2012 through 2017
11-21	Natural resources and mining	5,900	0.21%	0.20%	0.0%
22	Utilities	4,900	0.17%	0.16%	-0.01%
23	Construction	139,000	4.84%	5.56%	0.73%
31-33	Manufacturing	280,200	9.75%	9.28%	-0.46%
42	Wholesale trade	124,100	4.32%	4.31%	0.0%
44-45	Retail trade	319,300	11.11%	10.92%	-0.19%
48-49	Transportation and warehousing	87,800	3.05%	2.99%	-0.07%
51	Information	104,900	3.65%	3.62%	-0.03%
52-53	Financial activities	143,300	4.99%	4.83%	-0.15%
54-56	Professional and business services	349,300	12.15%	13.06%	0.91%
61	Education services	50,200	1.75%	1.78%	0.03%
62	Health services and social assistance	335,000	11.65%	11.86%	0.20%
71-72	Leisure and hospitality	277,200	9.64%	9.79%	0.15%
81	Other services	111,100	3.87%	3.69%	-0.17%
GOV	Federal government	73,100	2.54%	2.29%	-0.25%
GOV	State and local government, other	233,700	8.13%	7.54%	-0.59%
GOV	Government educational services	235,500	8.19%	8.11%	-0.08%

For 2012 through 2017, the largest increases in employment shares are projected for professional and business services, while the largest decreases are projected for state and local government, other.

Historical and projected growth rates

The Great Recession limited employment growth rates for most areas of the state from 2002 through 2012 to well below long-term historical trends. *Figure 5-3* shows the historical and projected growth rates for the state and Washington's 12 workforce development areas (WDAs).

Projected growth rates for 2012 through 2017 for all areas except for the Benton-Franklin and Snohomish WDAs are considerably higher than the rates achieved for the historical period (2002 through 2012). From 2012 through 2017, both the Benton-Franklin and Snohomish County WDAs are expected to be 0.50 percentage points below their historical growth rates. The largest growth rate increase over the 2012 through 2017 period is expected in the Seattle-King County WDA, with an increase of 1.68 percentage points. The Southwest Washington WDA is expected to gain 1.38 percentage points.

Figure 5-3. Annual historical and projected employment growth
Washington state and workforce development areas, 2012 through 2022
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics

Workforce development area	Historical growth rate 2002 through 2012	Projected growth rate 2012 through 2017	Projected growth rate 2017 through 2022	Historical trend growth 1975 through 2012*
Statewide	**0.82%**	**1.94%**	**1.27%**	**1.93%**
Olympic Consortium	0.51%	1.34%	1.00%	1.73%
Pacific Mountain	0.57%	1.67%	0.98%	1.50%
Northwest	0.95%	2.15%	1.38%	2.48%
Snohomish County	2.23%	1.73%	1.16%	3.12%
Seattle-King County	0.47%	2.15%	1.38%	1.84%
Pierce County	0.82%	2.04%	1.30%	1.94%
Southwest Washington	0.98%	2.36%	1.55%	2.33%
North Central	0.80%	1.47%	0.95%	2.21%
South Central	0.52%	1.37%	0.95%	1.18%
Eastern Washington	0.38%	1.40%	1.11%	1.34%
Benton-Franklin	2.08%	1.58%	1.23%	2.10%
Spokane County	0.62%	1.95%	1.20%	1.50%

*Trend growth is calculated by gathering historical data, plotting the trend line and calculating growth based on this trend line.

Benton-Franklin and Snohomish County WDAs are expected to have lower growth rates than average while the Seattle-King County WDA is expected to have the highest growth rate over the historical period (2002 through 2012).

Occupational projection results

Occupational projections represent total employment. Total employment includes nonfarm employment, private households, self-employment, agriculture, forestry and fishing.

The average annual growth rate for total employment is projected to be 1.94 percent from 2012 through 2017 and 1.27 percent from 2017 through 2022. The Employment Security Department predicted average annual growth rates for total employment growth of 1.71 percent from 2011 through 2016 and 1.10 percent from 2016 through 2021.

Projections for major occupational groups

Figure 5-4 shows occupational employment estimates and medium-term projections at the state level. The largest increases in employment shares are expected to be in construction and extraction occupations followed by computer and mathematical and food preparation and serving-related occupations. The largest decreases in employment shares are expected to be in farming, fishing and forestry occupations, sales and related, and office and administrative support occupations.

Occupational projections show that the top three major occupational groups for job openings will be in office and administrative support, sales and related, and food preparation and serving related occupations. Combined, these three major groups are projected to represent more than one-third of total job openings in the state. Openings may be due to growth or replacement.

Figure 5-4. Estimated and projected occupational employment structure
Washington state, 2012 through 2017
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics

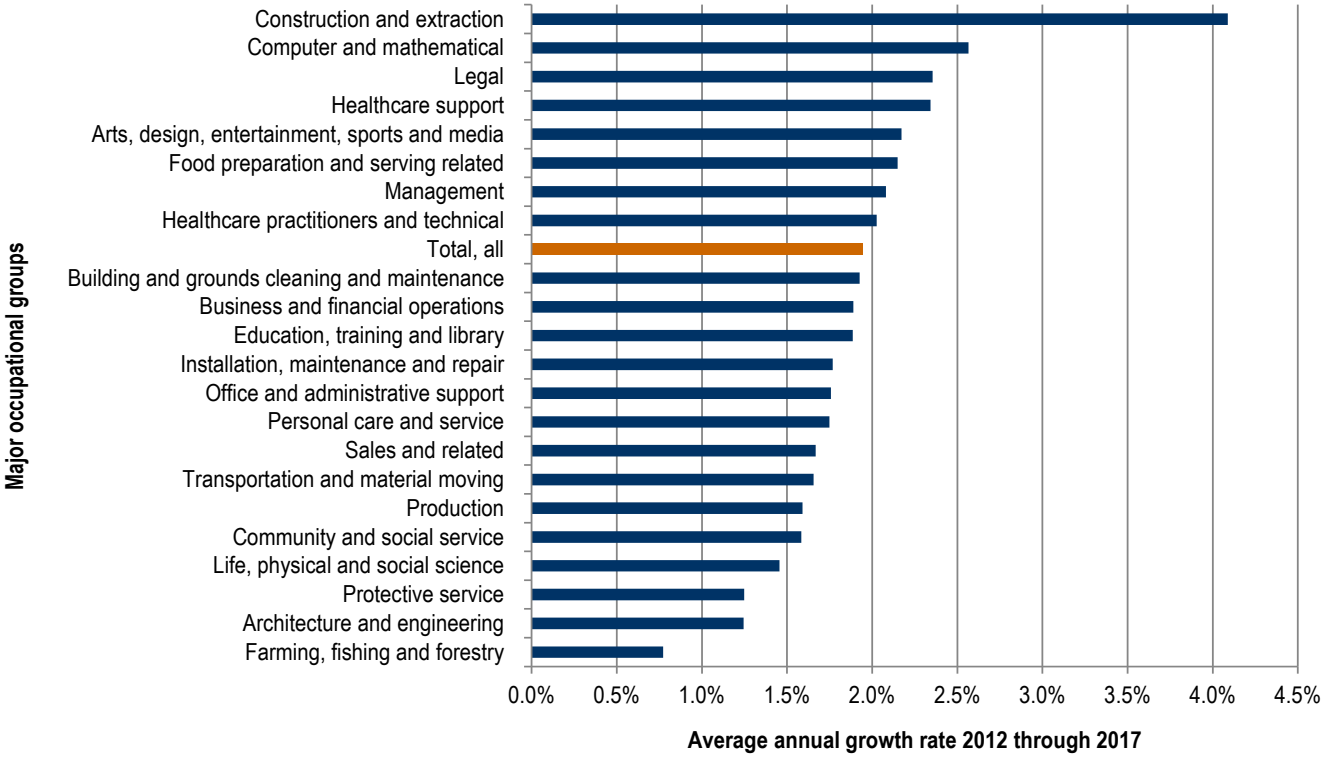
SOC	Major occupational group	Estimated employment 2012	Estimated share of employment in 2012	Projected share of employment in 2017	Percentage point change in employment share 2012 through 2017	Share of total average annual job openings 2012 through 2017
11	Management	180,206	5.38%	5.42%	0.04%	4.95%
13	Business and financial operations	186,801	5.58%	5.57%	-0.01%	4.85%
15	Computer and mathematical	147,511	4.41%	4.54%	0.14%	4.15%
17	Architecture and engineering	80,933	2.42%	2.34%	-0.08%	1.91%
19	Life, physical and social science	38,120	1.14%	1.11%	-0.03%	1.14%
21	Community and social service	55,050	1.64%	1.62%	-0.03%	1.43%
23	Legal	27,289	0.82%	0.83%	0.02%	0.74%
25	Education, training and library	195,510	5.84%	5.82%	-0.02%	5.27%
27	Arts, design, entertain., sports and media	69,053	2.06%	2.09%	0.02%	2.17%
29	Healthcare practitioners and technical	162,097	4.84%	4.86%	0.02%	4.36%
31	Healthcare support	85,136	2.54%	2.59%	0.05%	2.40%
33	Protective service	59,469	1.78%	1.72%	-0.06%	1.77%
35	Food preparation and serving related	241,947	7.23%	7.30%	0.07%	11.23%
37	Building and grounds cleaning and maint.	138,351	4.13%	4.13%	0.00%	3.72%
39	Personal care and service	150,031	4.48%	4.44%	-0.04%	4.06%
41	Sales and related	340,576	10.17%	10.04%	-0.14%	11.59%
43	Office and administrative support	427,903	12.78%	12.67%	-0.12%	11.66%
45	Farming, fishing and forestry	94,284	2.82%	0.12%	-2.70%	2.33%
47	Construction and extraction	163,561	4.89%	5.42%	0.54%	6.79%
49	Installation, maintenance and repair	121,449	3.63%	3.60%	-0.03%	3.38%
51	Production	176,550	5.27%	5.18%	-0.09%	4.40%
53	Transportation and material moving	205,379	6.14%	6.05%	-0.09%	5.69%

From 2012 through 2017, the largest percent increases in employment shares are expected to be in construction and extraction occupations, followed by computer and mathematical and food preparation and serving-related occupations.

The projected average annual growth rates for the major occupational groups in Washington state for 2012 through 2017 are presented in *Figure 5-5*.

At the state level, eight of the 22 major occupational groups have projected growth rates higher than the total employment growth rate. The fastest-growing occupational groups are projected to be construction and extraction, computer and mathematical, legal , and healthcare support occupations. The slowest occupational employment growth is expected in farming, fishing and forestry, architecture and engineering, protective service, and life, physical and social science occupations.

Figure 5-5. Average annual projected growth rates for major occupational groups
Washington state, 2012 through 2017
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics



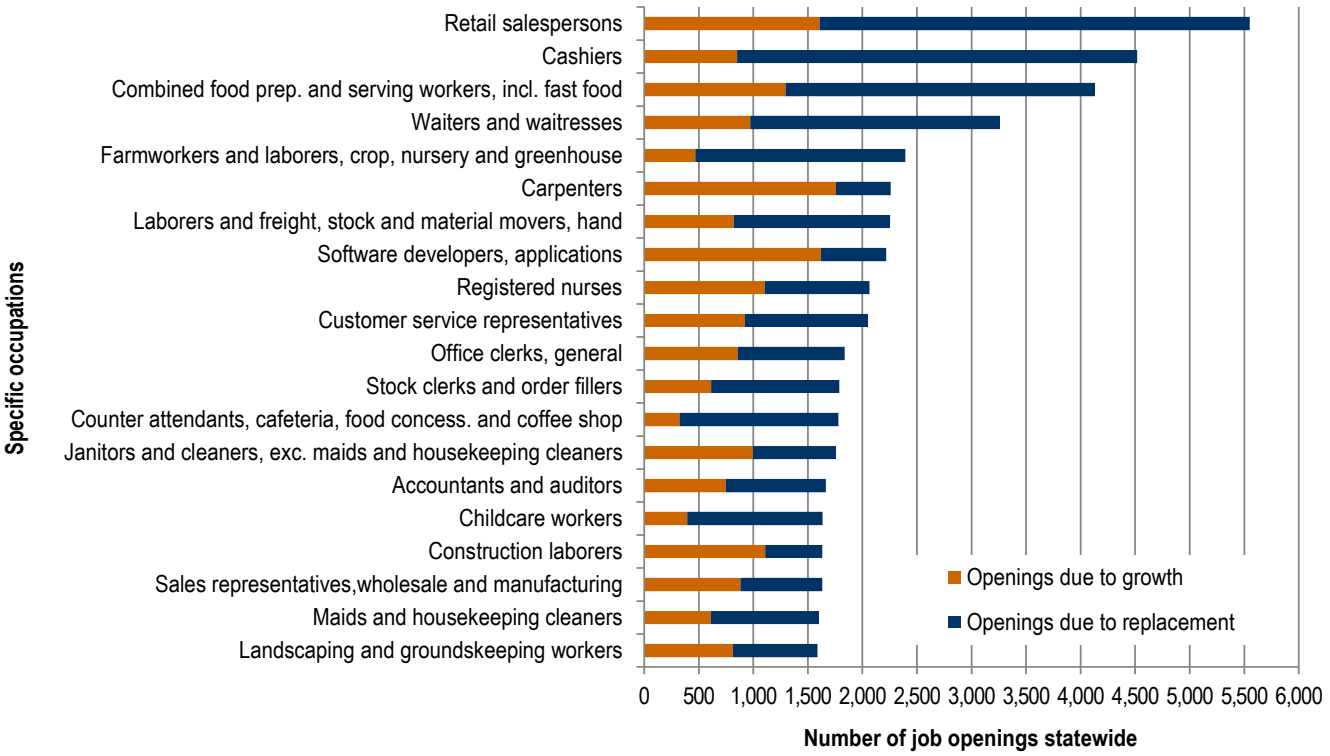
At the state level, eight of the 22 major occupational groups have projected growth rates higher than the growth rate for total employment and 14 have projected growth rates lower than the rate for total employment.

Projections for specific occupations

The top 20 specific occupations by total openings are presented in *Figure 5-6*. At the detailed occupational code level (six-digit SOC), retail salespersons and cashiers are projected to have the largest number of openings. Openings can be due to growth (newly created positions) or replacement. Replacement includes openings created by retirements and separations. It does not include normal turnover as workers go from one employer to another or from one region to another without changing occupations.

For seven of the top 20 occupations, the number of openings due to growth is projected to be larger than the openings due to replacement. Among them, the largest absolute and relative differences are for carpenters, where the number of openings due to growth is 3.5 times greater than the number of openings due to replacement. For the other 13 occupations in the top 20, the number of openings due to replacement is projected to be greater than the number of openings due to growth.

Figure 5-6. Top 20 specific occupations by average annual total openings
Washington state, 2012 to 2017
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics



For seven of the top 20 occupations, the average annual projected number of openings due to growth is larger than that due to replacement. Among them, the largest absolute and relative differences are for carpenters, where the number of openings due to growth is 3.5 times greater than replacement.

For total employment from 2012 through 2017, about 55 percent of openings are projected to be due to replacement and 45 percent to growth. This is an unusual ratio with its high growth and is due to recovery dynamics from the recession. The ratio of replacement to growth from 2017 through 2022 is projected to be more typical at 64 percent replacement and 36 percent growth.

Specific occupations by area

Tables showing the 2014 projections for specific occupations the state and each workforce development area are available on Employment Security's website.[29]

[29] https://fortress.wa.gov/esd/employmentdata/docs/industry-reports/projections-appendix.xls.

Chapter 6: Income and wages

Household and family income

The Great Recession gripped the state and nation from 2008 through 2009, with employment continuing to decline into 2010, only beginning to recover in 2011. Real (i.e. inflation-adjusted) household incomes also declined during the recession.

Income is the sum of the amounts reported separately for the following: wage or salary income; net self-employment income; interest, dividends, or net rental or royalty income or income from estates and trusts; Social Security or Railroad Retirement income; Supplemental Security Income (SSI); public assistance or welfare payments; retirement, survivor, or disability pensions; and all other income.

Receipts from the following sources are not included as income: capital gains; money received from the sale of property (unless the recipient was engaged in the business of selling such property); the value of income "in kind" from food stamps, public housing subsidies, medical care, employer contributions for individuals, etc.; withdrawal of bank deposits; money borrowed; tax refunds; exchange of money between relatives living in the same household; gifts and lump-sum inheritances, insurance payments and other types of lump-sum receipts.

Unlike employment levels, an income recovery has yet to materialize (*Figure 6-1*). According to the U.S. Census Bureau's American Community Survey (ACS), the real median household income in Washington state declined by 4.8 percent from 2009 to 2012. From 2012 to 2013, real earnings growth from holding a job also was flat.

Washington households continued to have a higher median income than the nation but weathered the downturn slightly worse than the nation as a whole. Since 2009, the median Washington household income fell by 4.7 percent. Nationally, the decline from 2009 to 2013 was slightly smaller, 3.9 percent. The decline was greater for non-family households, which dropped by 6.6 percent compared to a 4.1 percent drop in median income among family households.[30]

[30] The U.S. Census Bureau divides households into two types. A family household contains at least two persons, and at least one other person in the household is related to the householder by birth, marriage or adoption. A non-family household may contain only one person or additional persons that are not related to the householder.

Figure 6-1. Median household income, in 2013 dollars
United States and Washington state, 2009 to 2013
Source: Employment Security Department/LMPA; U.S. Census Bureau, American Community Survey

Household type	2009	2010	2011	2012	2013	Change 2009 to 2013
All households, U.S.	**$54,389**	**$53,163**	**$52,190**	**$51,915**	**$52,250**	**-3.9%**
All households, Washington	$61,292	$59,314	$58,879	$58,368	$58,405	-4.7%
Family households	$74,448	$71,990	$71,079	$70,801	$71,371	-4.1%
Non-family households	$39,018	$37,822	$36,981	$36,882	$36,452	-6.6%

Real median household income has stopped declining, but has yet to show any real recovery.

From 2007 to 2013, according to the ACS:

- The poverty rate increased over the course of the recession and recovery period. In 2013, 14.1 percent of all Washington residents fell under the poverty threshold.[31] Compare to an 11.4 percent poverty rate in 2007. Children tend to have the highest poverty rates. The poverty rate for children rose from 17.8 percent in 2007 to 21.8 percent in 2010. By 2013, 19.1 percent of children residing in Washington state were living under the threshold.
- The share of households with earnings from a job and the average household earnings from holding a job did not change significantly in 2013 and remained below 2007 levels. Average earnings in 2013 were higher than 2012 levels, but were not statistically different from levels observed in 2007.
- The number of people who reported working full-time jobs (35 or more hours per week) fell sharply in 2009 and began to rebound in 2012. In 2013, 57.1 percent of job holders worked full time. This is up from 56.5 percent in 2012, and down from 61.6 percent in 2007. The number of part-time workers rose throughout the recession, reaching a peak level in 2011 and declined in 2012 and 2013. In 2013, the proportion of full-time workers fell relative to 2007, while part-time employment expanded over the same period.

[31] The U.S. government establishes a poverty threshold every year. The threshold varies based on family size and composition. In 2013, the threshold for a family of two adults and two children under age 18 was $23,624. Thresholds for other family sizes can be found at www.census.gov/hhes/www/poverty/data/threshld/index.html.

- Median earnings for all workers did not change significantly from 2012 and was 8.3 percent lower than in 2007, reflecting the shift towards more part-time jobs. The median earnings for male full-time, year-round workers also remained largely unchanged in 2013; however, earnings fell by 5.2 percent from 2007 to 2013. The median earnings for female full-time, year-round workers has not changed appreciably since before the recession started.
- An estimated 5.9 percent of the workforce identified as primarily self-employed in 2013, down from 6.3 percent in 2012 and 6.8 percent in 2007.
- The percentage of households with a Social Security beneficiary has increased from 24.7 percent in 2007 to 28.1 percent in 2013, no surprise with the aging demographic trend.
- The proportion of households receiving private pension payments dipped slightly to 18.2 percent in 2013. This is up from 18.0 percent in 2007 and not surprising in light of aging demographics. The average monthly payout in 2013 was $1,976, compared to $1,962 in 2007.
- Just under 5 percent of households had members who received Supplemental Security Income (largely for people with disabilities), with an average payout of $786 per month, basically unchanged from 2012, but higher than in 2007 ($756 per month).
- The share of households receiving welfare remained unchanged at 4.0 percent in 2012 and 2013, falling from a peak of 4.6 percent in 2010. The average benefit fell to $234 per month in 2013. This is down from a monthly benefit of $352 in 2010.
- The share of households receiving food stamps remained statistically unchanged from 2012 to 2013 and reached 14.8 percent of the state. Compare to 2007 when the share was closer to 7.7 percent.
- Health insurance coverage did not change significantly in 2013. In 2013, 14.0 percent of Washington residents had no health insurance, up from 12.5 percent in 2008. Over the same time period, the percent of residents covered by private health insurance decreased, and the percent of households relying solely on public coverage increased from 13.3 percent in 2008 to 17.5 percent in 2013.

- Homeownership peaked at 66.1 percent in 2007. By 2009, the rate of homeownership in Washington had fallen to 64.3 percent and has continued to fall in the intervening years. The homeownership rate was 61.9 percent in 2013, well below the previous peak.[32] The percent of households in economic distress due to high housing costs and rising home values increased in the first few years of recession, but then declined through the foreclosure process as homeowners transitioned to renters. In mid-2014, according to one source, 6.3 percent of homeowners with a mortgage were underwater (i.e., had mortgage debt greater than the market value of the home), down from a rate of 10.0 percent a year before.[33]

Since 2009, the percent of households in lower income brackets has increased, while the number of those in upper income brackets has fallen (*Figures 6-2* and *6-3*). The percentage of households with less than $25,000 in income climbed from 18.3 percent in 2009 to 20.4 percent in 2013. Households with incomes of $25,000 to $74,999 declined (41.3 percent in 2009 to 40.9 percent in 2013) and the percentage with incomes of $75,000 and above fell from 40.4 percent to 38.7 percent.

The 2007 recession depressed household incomes and pushed more people into the government safety net. The only income brackets that showed any improvement from 2012 to 2013 were those at the lower end of the spectrum and those earning more than $150,000 annually.

[32] Data for 2007 is not included in this report, but can be found in the 2012 Labor Market and Economic Report: https://fortress.wa.gov/esd/employmentdata/docs/economic-reports/annual-report-2012.pdf.

[33] The CoreLogic Negative Equity Report for second quarter 2014 is available at http://www.corelogic.com/research/negative-equity/corelogic-q2-2014-equity-report.pdf.

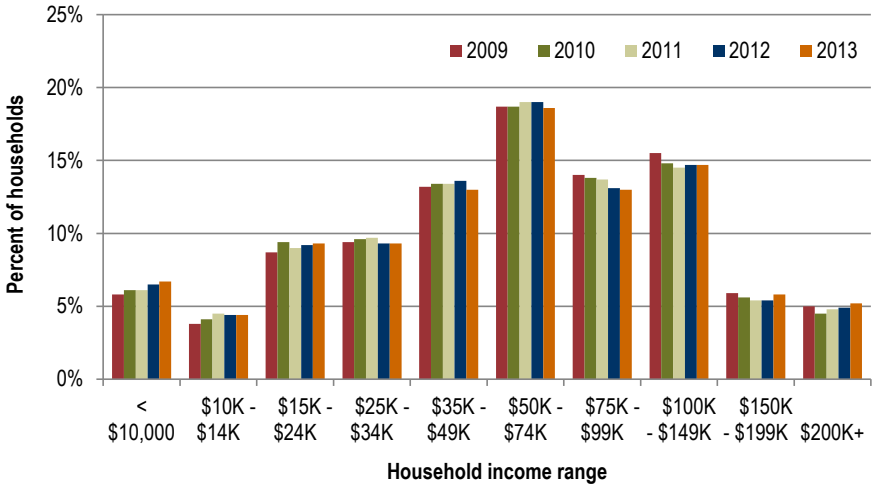
Figure 6-2. Selected household statistics, in 2013 dollars
Washington state, 2007 through 2013
Source: U.S. Census Bureau, American Community Survey

Household statistic	2007	2008	2009	2010	2011	2012	2013
Poverty rate, all individuals	11.4%	11.4%	12.3%	13.4%	13.9%	13.5%	14.1%
Poverty rate, children under 5	17.8%	17.4%	18.1%	21.8%	20.4%	21.0%	19.1%
Households with earnings from a job *	81.3%	81.4%	80.6%	79.2%	79.0%	78.7%	78.5%
Average household earnings from a job**	$81,545	$81,175	$79,451	$77,086	$77,295	$78,241	$79,093
Full-time workers***	61.6%	61.1%	58.9%	56.5%	55.7%	56.5%	57.1%
Part-time workers	19.0%	19.5%	19.8%	19.8%	19.9%	19.5%	19.2%
Median earnings for all workers	$35,282	$34,208	$33,580	$32,557	$32,415	$32,448	$32,348
Median earnings for male full-time, year-round workers	$55,372	$54,771	$54,990	$55,107	$54,913	$53,482	$52,482
Median earnings for female full-time, year-round workers	$42,660	$41,686	$42,191	$42,817	$42,059	$41,419	$41,897
Percent of workers who are self-employed	6.8%	6.4%	6.6%	6.2%	6.1%	6.3%	5.9%
Households receiving Social Security	24.7%	24.8%	25.2%	25.8%	26.9%	27.3%	28.1%
Households receiving private pension payments	18.0%	18.0%	17.7%	17.9%	17.7%	18.3%	18.2%
Average monthly payout for households receiving private pensions	$1,962	$1,939	$1,997	$1,985	$2,059	$1,999	$1,976
Households receiving Supplemental Security Income (SSI)*	3.7%	3.1%	3.2%	4.8%	4.8%	4.7%	4.6%
Average monthly payout for those receiving SSI	$756	$764	$717	$791	$767	$781	$786
Households receiving welfare cash payments*	3.1%	3.4%	4.1%	4.6%	4.3%	4.0%	4.0%
Average monthly payout for welfare recipients	$312	$305	$336	$352	$319	$284	$234
Households receiving food stamps*	7.7%	8.7%	11.1%	13.3%	14.5%	15.1%	14.8%
Residents without health insurance	N/A	12.5%	13.4%	14.2%	14.2%	13.9%	14.0%
Number of residents without health insurance	N/A	841,997	877,184	942,608	953,789	944,238	960,981
Residents with private health insurance	N/A	73.6%	71.0%	69.3%	68.8%	69.0%	68.5%
Residents relying solely on public health insurance	N/A	13.3%	15.6%	16.5%	17.0%	17.1%	17.5%
Renters paying more than 30 percent of income for housing	47.2%	47.9%	50.1%	51.1%	50.7%	50.7%	50.9%
Homeownership rate	66.1%	65.3%	64.3%	63.1%	62.8%	62.3%	61.9%
Homeowners paying more than 30 percent of income for housing	33.5%	34.1%	41.1%	41.0%	39.4%	36.7%	34.2%

*Households may fall into more than one of these categories.
**Includes earnings from all members in the household.
***Full-time workers usually worked at least 35 hours per week (but may not be year-round workers).

There were more people in poverty, more depending on the safety net and fewer homeowners in 2013 compared with 2007.

Figure 6-3. Percent of households by income range, in 2013 dollars
Washington state, 2009 through 2013
Source: U.S. Census Bureau, American Community Survey



There were more lower-income households in 2013 relative to 2009 and fewer upper middle-income households.[34]

Average annual wage

The previous section addressed household income dynamics and economic well-being, as reported by the U.S. Census Bureau. The next two sections shift the focus from households to jobs with analysis of ESD data on employment, wages and hourly earnings.

Average annual wage is computed by dividing total payroll from businesses that are paying into the Washington state unemployment insurance system by the total number of employees. Full- and part-time workers are not differentiated in this calculation.

The total wages paid to workers by their employers in 2013 came to nearly $157 billion. The average annual wage, divided among 2,960,071 workers, was $53,030. This is up a little over 6 percent over wages observed in 2008. The average annual wage continued to increase throughout the recent recession and recovery, while employment levels fell and then were slowly building up. Post-recession employment did not reach pre-recession levels until 2013.

[34] Changes in the proportion of households earning less than $25,000 per year and households earning between $75,000 and $149,999 were statistically significant. Other wage ranges remained largely unchanged from 2009 to 2013.

Figure 6-4. Average annual wage for jobs covered by unemployment insurance, in 2013 dollars
Washington state, 2008 through 2013
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics; Quarterly Census of Employment and Wages

	2008	2009	2010	2011	2012	2013
Covered jobs	2,950,742	2,836,354	2,808,445	2,844,391	2,894,394	2,960,071
Average annual wage	$49,944	$50,946	$51,232	$51,793	$52,589	$53,030

The average annual wage has increased every year since 2008.

Hourly wages and hours worked

While average annual wages certainly tell a piece of the story, there are a number of considerations that are not addressed by this measure. In particular, as mentioned in the preceding section, full- and part-time employees are not differentiated in the calculation. A large number of part-time jobs would have the effect of pulling down the average annual wage. Another consideration is the distribution of wages paid to workers. How many workers have low-wage jobs as compared to high-wage jobs and how has this changed over time? This section focuses on the trends for jobs covered by the Washington state unemployment insurance system.[35]

Every three months, each employer in the state of Washington submits a list of their employees, the wages earned and the hours worked by each covered employee to the Employment Security Department. These reports are compiled into a quarterly wage file that has more than three million records. Some of the jobs in the quarterly wage file are of very short duration, while many are full-time jobs (typically 520 hours in a quarter). In this analysis, jobs are weighted by the number of hours worked, with one full-time equivalent (FTE) job equaling 2,080 hours of work per year.[36] A job that lasts 208 hours, for example, would be counted as 0.1 FTE.

[35] NAICS is the North American Industrial Classification System. Bonuses and overtime pay are included as part of wages; non-wage income such as benefits and tips are not included. Federal government jobs and jobs with private household employers (NAICS code 814) are also not included.
[36] In some years, an FTE job may be 2,088 hours.

From 2008 to 2010, the number of jobs covered by unemployment insurance fell 5.3 percent, while the number of FTE jobs declined by 6.9 percent (*Figure 6-5*). The FTE measure captured both the loss of jobs and the cut in hours worked in jobs that were not eliminated entirely. Conversely, from 2010 to 2013, the number of jobs increased by 5.4 percent, while the number of FTE jobs grew by 6.7 percent, indicating not only more jobs but also recovery in hours worked. The net loss for the 2008 to 2013 period was similar for both measures (decrease of 0.1 percent for jobs, decrease of 0.7 percent for FTE jobs).

Figure 6-5. Covered employment vs. FTE employment
Washington state, 2008 through 2013
Source: Employment Security Department/LMPA, Unemployment Insurance Data Warehouse

Employment	2008	2009	2010	2011	2012	2013
Covered employment	2,994,250	2,863,950	2,836,850	2,873,350	2,921,575	2,990,250
FTE employment	2,333,128	2,211,346	2,171,595	2,213,706	2,264,831	2,317,103

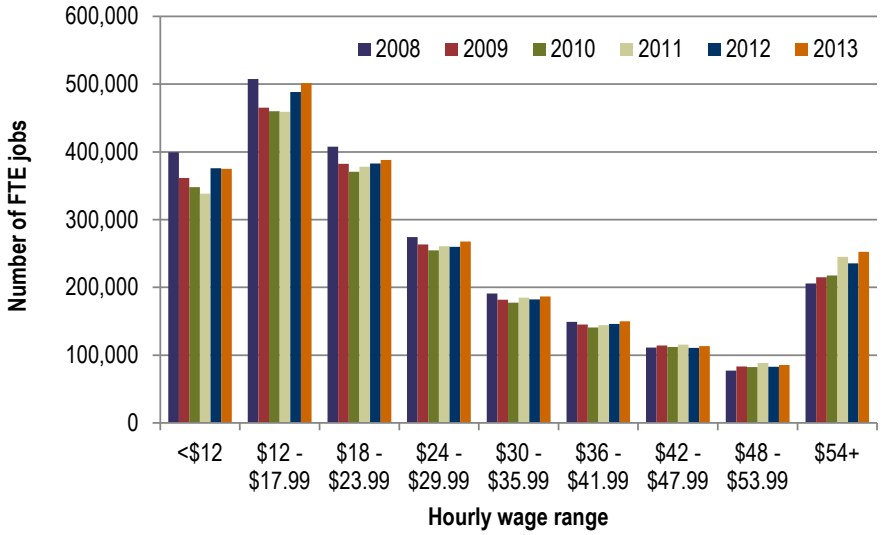
FTE employment has consistently been about 78 percent of total covered employment.

The availability of information on wages and hours worked makes it possible to plot out the distribution of FTE jobs by wage range. In Washington state, the largest portion of jobs consistently falls at the lower end of the wage spectrum, with diminishing numbers at higher wage ranges.

Figure 6-6 shows the effects of the economic downturn on FTEs at different wage levels. From 2008 to 2009, the total FTE level dropped by 4.8 percent. Losses were concentrated among FTEs at the low end of the pay scale. FTEs earning less than $12 per hour dropped by 9.5 percent and jobs earning $12 to $18 per hour shed 8.4 percent. As the recession progressed, aggregated losses were apparent at most wage levels, but continued to be the most pronounced among lower wage jobs. Over the course of the recession and recovery, high-wage jobs, in contrast, continued to expand.

In 2013, jobs were added in eight of the nine wage ranges displayed in *Figure 6-6*. The only wage range that did not see job growth over the year was for jobs paying less than $12. Job growth was most pronounced among high-wage jobs. Jobs paying over $54 per hour increased by 7 percent, compared to an overall year-over-year increase of 2.4 percent. There were still fewer jobs in every wage range below $36 per hour in 2013 than in 2008.

Figure 6-6. Change in average annual wages, in 2013 dollars
Washington state, 2008 through 2013
Source: Employment Security Department/LMPA, Unemployment Insurance Data Warehouse

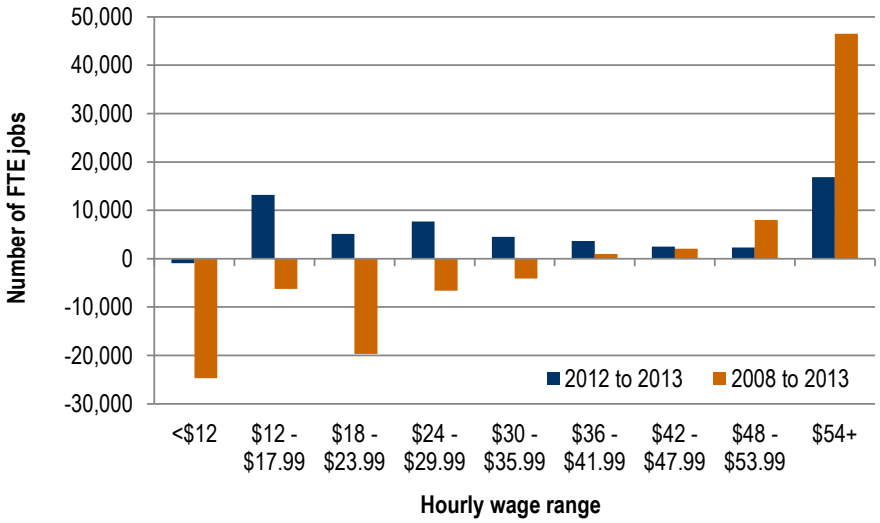


FTE job losses in the Great Recession were most pronounced among low-wage jobs.

Changes in FTE employment varied by wage as well as industry. Construction and non-aerospace manufacturing, the two industries hit hardest by the downturn, accounted for a large portion of the job losses within the lower- and middle-wage ranges from 2008 to 2013 (*Figure 6-7*). Much of the increase in jobs at the top end could be traced to a handful of industries: software, professional services (particularly computer systems design) and healthcare (evenly split between clinics and hospitals).[37]

[37] Employment levels by industry are reported in the Quarterly Census of Employment and Wages published at: https://fortress.wa.gov/esd/employmentdata/reports-publications/industry-reports/quarterly-census-of-employment-and-wages.

Figure 6-7. Change in number of FTE jobs by hourly wage range, in 2013 dollars
Washington state, 2008 through 2012 and 2012 to 2013
Source: Employment Security Department/LMPA, Unemployment Insurance Data Warehouse



Job losses were predominantly among low-wage jobs. Employment at the upper end of the spectrum actually increased throughout the recession and recovery period.

Washington's median wage rose from 2008 to 2009 as a consequence of low-wage job losses at the start of the recession, but has changed little over the intervening years (*Figure 6-8*). From 2012 to 2013, the median wage rose slightly from $21.90 to $22.09 per hour. However, at $22.09 per hour, the 2013 median wage is still 1.4 percent below the median wage observed in 2009 and only 2.4 percent higher than 2008 wages. Wages for the bottom 10 percent of jobs have been stable, due to Washington state's inflation-adjusted minimum wage. The average wage for the top 10 percent of jobs increased by 10.6 percent from 2008 to 2013.

This means that wage disparity continued to increase over the course of the recession and the recovery. The gap between the average wage for the lowest-paid 10 percent of jobs and the average wage for the highest-paid 10 percent of jobs has been widening over time (*Figure 6-8*). The gap between the median and the lowest-paid 10 percent of jobs has remained relatively steady, while the gap between the median and the highest-paid 10 percent of jobs grew.[38]

[38] The upper 10-percent paying jobs does not include many corporate officers (generally the highest-paid employees), and wages do not include stock options or income from capital gains.

Figure 6-8. Measuring the hourly wage gap, in 2013 dollars
Washington state, 2008 through 2013
Source: Employment Security Department/LMPA; Unemployment Insurance Data Warehouse

Average wage for	2008	2009	2010	2011	2012	2013
Lowest-paid 10 percent of jobs	$9.16	$9.54	$9.46	$9.46	$9.39	$9.50
Median wage	$21.57	$22.40	$22.18	$22.25	$21.90	$22.09
Highest-paid 10 percent of jobs	$90.73	$92.46	$94.23	$96.68	$99.26	$100.33
Ratio of highest 10 to lowest 10	9.9	9.7	10.0	10.2	10.6	10.6
Ratio of highest 10 to median	4.2	4.1	4.2	4.3	4.5	4.5
Ratio of median to lowest 10	2.4	2.3	2.3	2.4	2.3	2.3

The gap between the highest- and lowest-paid jobs did not change from 2012 to 2013, but has generally been increasing since 2009.

Personal and per capita income[39]

Personal income is the sum of earned income (from owning a business or holding a job), investment income and transfer payments chiefly from government programs such as Social Security, Medicare and Medicaid, welfare, food stamps, Supplemental Security Income (SSI) and unemployment benefits. Per capita personal income is the total personal income of an area divided by the population of the area. Since per capita income is an average, it is influenced by factors such as relative concentration of high-income households, family size and the number of retirees in an area.

Per capita income, as shown in *Figure 6-9*, dropped sharply in 2009, slid a bit more in 2010 and then started to recover in 2011 and reached a new high in 2012. There was only a slight (0.2 percent) gain in 2013, to $47,717. Historically the state's income has been 5 to 8 percent above the U.S. and that was true in 2013, when per capita income was 6.6 percent above the national figure.

Income changes had three primary components:

First, total *earned income* continued its expansion in 2013. After a big drop in 2009 and little improvement in 2010, income from wages and business ownership rose by 3.5 percent in 2011, 3.9 percent in 2012 and a more modest 1.5 percent in 2013. On a per capita basis, the increases were 2.3, 2.7 and 0.4 percent. Earned income accounted for 64 percent of total personal income in 2013. It has been a shrinking proportion of the total since 1999, when it was 69 percent. It will likely continue to ebb over the long term due to stagnant wages and the aging population.

[39] All data on personal and per capita income are produced by the U.S. Bureau of Economic Analysis; inflation adjustment provided by Employment Security Department/LMPA.

Investment income declined in 2009 (-14 percent) and tumbled further in 2010 (-5 percent). Then it started making up ground, increasing 8 percent in 2011 and 12 percent in 2012 before easing back to a 1 percent gain in 2013. The 2013 total nearly matched the previous high in 2008 in terms of total dollars, but was 6 percent below the peak on a per capita basis.

For almost two decades, total *transfer payments* had grown along with the economy, consistently comprising about 13 percent of personal income. With the onset of the recession, they played a countercyclical role, climbing by 7 percent in 2008, 18 percent in 2009 and 6 percent in 2010, when they made up 17 percent of total income. Social Security retirement payments, which had been trending upward by about 4 percent a year, jumped by 10 percent in 2009, as people were forced into early retirement.

Since 2010, transfer payments have stabilized, falling by 2 percent in 2011, holding steady in 2012, and increasing slightly (less than 1 percent) in 2013, well below the rate of population growth. While Social Security retirement, Medicare and Medicaid payments have continued to expand, income maintenance programs (welfare, food stamps, energy assistance and a variety of other programs) declined for two years running before leveling out in 2013. Unemployment benefits have fallen by more than half from their peak. Still, comparing 2008 with 2013, transfer payments are significantly higher in both dollar amounts and on a per capita basis. Part of the reason is demographics (Social Security, Medicare) and part is due to loss of income (welfare, food assistance, unemployment benefits).

Figure 6-9. Personal income including transfer payments, in 2013 dollars
Washington state, 2007 through 2013
Source: Employment Security Department/LMPA; U.S. Bureau of Economic Analysis

Type of income	2007	2008	2009	2010	2011	2012	2013
Total personal income (billions)	**$305.9**	**$310.7**	**$301.5**	**$302.9**	**$313.3**	**$328.3**	**$332.7**
Earned income	$199.3	$199.5	$192.7	$194.2	$200.9	$208.7	$211.9
Investment income	$68.1	$70.0	$60.2	$56.9	$61.8	$69.1	$69.8
Transfer payments	$38.5	$41.2	$48.6	$51.8	$50.6	$50.6	$51.0
Social Security/retirement	$15.5	$16.0	$17.5	$18.0	$18.2	$19.0	$19.7
Medicare and Medicaid	$14.9	$15.5	$16.6	$17.6	$18.0	$18.3	$18.5
Welfare, food stamps, Social Security Income	$3.7	$4.6	$5.6	$6.4	$6.1	$5.8	$5.8
Unemployment benefits	$0.9	$1.3	$4.0	$4.6	$3.3	$2.5	$1.8
Per capita personal income (dollars)	**$47,342**	**$47,349**	**$45,227**	**$44,924**	**$45,927**	**$47,619**	**$47,717**
Earned income	$30,843	$30,408	$28,901	$28,802	$29,458	$30,265	$30,396
Investment income	$10,537	$10,661	$9,036	$8,445	$9,059	$10,015	$10,006
Transfer payments	$5,962	$6,280	$7,289	$7,678	$7,410	$7,338	$7,315
Social Security/retirement	$2,055	$2,077	$2,256	$2,300	$2,315	$2,425	$2,505
Medicare and Medicaid	$2,308	$2,358	$2,495	$2,607	$2,641	$2,652	$2,649
Welfare, food stamps, Social Security Income	$576	$705	$841	$947	$888	$837	$826
Unemployment benefits	$133	$205	$607	$676	$484	$365	$259

Transfer payments, chiefly from government programs, grew during the recession and remained high in 2013.

Chapter 7: Economic comparisons with other states

Figure 7-1. States with minimum wage higher than federal minimum wage, based on 2014 ranking
United States and Washington state, 2004, 2009 and 2014
Source: U.S. Department of Labor, Wage and Hour Division

Rank	State	2004	2009	2014
	United States	**$5.15**	**$6.55**	**$7.25**
1	District of Columbia	$6.15	$7.55	$9.50
2	**Washington**	**$7.16**	**$8.55**	**$9.32**
3	Oregon	$7.05	$8.40	$9.10
4	California	$6.75	$8.00	$9.00
5	Vermont[1]	$6.75	$8.06	$8.73
6	Connecticut	$7.10	$8.00	$8.70
7	Illinois[2]	$5.50	$7.75	$8.25
7	New Jersey	$5.15	$7.15	$8.25
9	Colorado	$5.15	$7.28	$8.00
9	Massachusetts	$6.75	$8.00	$8.00
9	New York	$5.15	$7.15	$8.00
9	Rhode Island	$6.75	$7.40	$8.00
13	Florida	N/A	$7.21	$7.93
14	Arizona	N/A	$7.25	$7.90
15	Alaska	$7.15	$7.15	$7.75
15	Delaware	$6.15	$7.15	$7.75
17	Maine	$6.25	$7.25	$7.50
17	Missouri	$5.15	$7.05	$7.50
17	New Mexico	$5.15	$7.50	$7.50
20	Michigan[1]	$5.15	$7.40	$7.40

[1]Rates applicable to employers of two or more.
[2]Rates applicable to employers of four or more.
N/A = Wages not above federal minimum.

Minimum Wage

Unemployment Rates

Figure 7-2. Ten highest and lowest state unemployment rates, seasonally adjusted, based on 2013 ranking
United States and Washington state, 2003, 2008, 2013 and January through September 2014
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics

Rank	State	2003	2008	2013	Average January through September 2014
	United States	**6.0%**	**5.8%**	**7.4%**	**5.9%**
1	North Dakota	3.6%	3.2%	2.9%	2.8%
2	South Dakota	3.5%	3.0%	3.8%	3.4%
3	Nebraska	4.0%	3.3%	3.9%	3.6%
4	Vermont	4.5%	4.6%	4.4%	4.4%
5	Utah	5.6%	3.4%	4.4%	3.5%
6	Wyoming	4.5%	3.1%	4.6%	4.7%
7	Iowa	4.4%	4.1%	4.7%	4.6%
8	Hawaii	3.9%	4.1%	4.8%	4.2%
9	Minnesota	4.9%	5.5%	5.0%	4.1%
10	New Hampshire	4.5%	3.9%	5.3%	4.3%
28	**Washington**	**7.4%**	**5.5%**	**7.0%**	**5.7%**
42	New Jersey	5.9%	5.5%	8.2%	6.5%
43	Tennessee	5.7%	6.7%	8.2%	7.3%
44	Kentucky	6.3%	6.6%	8.3%	6.7%
45	District of Columbia	7.0%	6.6%	8.3%	7.7%
46	Mississippi	6.4%	6.9%	8.6%	7.7%
47	Michigan	7.1%	8.3%	8.8%	7.2%
48	California	6.9%	7.3%	8.9%	7.3%
49	Illinois	6.7%	6.4%	9.1%	6.6%
50	Rhode Island	5.4%	7.7%	9.5%	7.6%
51	Nevada	5.4%	7.1%	9.8%	7.3%

Figure 7-3. Highest and lowest state average annual job-growth rates, nonfarm employment
United States and Washington state, 2000 to 2013
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics, Current Employment Statistics

Nonfarm Employment

Rank	State	Average annual growth rate
	United States	**0.2%**
1	North Dakota	2.4%
2	Wyoming	1.5%
3	Utah	1.4%
4	Texas	1.3%
4	Alaska	1.3%
6	Montana	1.1%
6	District of Columbia	1.1%
8	Idaho	1.0%
8	Nevada	1.0%
10	Arizona	0.9%
10	Hawaii	0.9%
12	South Dakota	0.8%
13	**Washington**	**0.7%**
13	New Mexico	0.7%
15	Colorado	0.6%
15	Florida	0.6%
15	Oklahoma	0.6%
46	Indiana	-0.2%
46	Connecticut	-0.2%
48	Illinois	-0.3%
48	Mississippi	-0.3%
50	Ohio	-0.5%
51	Michigan	-1.0%

Annual Exports

Figure 7-4. Ten highest and lowest state annual exports, based on 2013 ranking
United States and Washington state, 2003, 2008 and 2013
Source: U.S. Department of Commerce, Office of Trade and Economic Analysis

Rank	State	2003	2008	2013
1	Texas	$98,920,252,232	$192,221,780,916	$279,490,894,087
2	California	$93,906,331,503	$144,805,748,349	$168,044,753,621
3	New York	$40,144,340,162	$81,385,735,231	$86,522,548,993
4	**Washington**	**$35,400,898,941**	**$54,498,049,919**	**$81,636,895,348**
5	Illinois	$26,502,617,666	$53,677,477,963	$66,088,537,529
6	Florida	$18,332,194,826	$41,908,136,496	$63,338,555,809
7	Louisiana	$24,905,128,219	$54,238,239,529	$61,344,304,254
8	Michigan	$33,488,995,528	$45,135,506,345	$58,652,790,164
9	Ohio	$29,797,555,361	$45,627,982,845	$50,799,278,129
10	Pennsylvania	$16,216,151,066	$34,648,502,042	$41,161,471,956
42	North Dakota	$2,626,881,487	$3,697,411,932	$4,026,061,898
43	New Hampshire	$852,469,684	$2,772,203,944	$3,729,109,452
44	Maine	$2,327,569,491	$2,782,906,663	$2,727,517,226
45	New Mexico	$809,221,035	$1,195,906,725	$2,707,610,323
46	Rhode Island	$2,200,020,809	$3,016,395,471	$2,686,653,205
47	District of Columbia	$1,177,591,055	$1,974,431,973	$2,162,791,812
48	Montana	$672,182,330	$1,653,712,654	$1,585,579,761
49	South Dakota	$362,878,012	$1,394,600,906	$1,506,309,983
50	Wyoming	$581,364,515	$1,081,014,094	$1,335,647,352
51	Hawaii	$367,824,797	$959,607,734	$597,993,075

Figure 7-5. Ten highest and lowest state per capita personal income, in 2013 dollars, based on 2013 ranking
United States and Washington state, 2003 and 2013
Source: U.S. Bureau of Economic Analysis, National Bureau of Economic Research

Personal Income

Rank	State	2003	2013	Average annual growth rate
	United States	**$32,676**	**$44,543**	**3.1%**
1	District of Columbia	$48,440	$74,513	4.4%
2	Connecticut	$43,822	$60,847	3.3%
3	North Dakota	$29,569	$57,084	6.8%
4	Massachusetts	$40,616	$56,923	3.4%
5	New Jersey	$41,229	$55,993	3.1%
6	Maryland	$39,296	$54,259	3.3%
7	New York	$36,984	$54,063	3.9%
8	Wyoming	$33,339	$50,924	4.3%
9	New Hampshire	$36,121	$50,156	3.3%
10	Alaska	$34,888	$50,032	3.7%
14	**Washington**	**$34,620**	**$47,031**	**3.1%**
42	Arizona	$28,454	$36,823	2.6%
43	Alabama	$27,115	$36,501	3.0%
44	New Mexico	$26,307	$36,284	3.3%
45	Utah	$26,305	$36,274	3.3%
46	Kentucky	$26,734	$36,239	3.1%
47	Arkansas	$25,490	$36,086	3.5%
48	West Virginia	$24,704	$35,613	3.7%
49	South Carolina	$26,876	$35,453	2.8%
50	Idaho	$27,086	$35,382	2.7%
51	Mississippi	$24,008	$34,478	3.7%

Building Permits

Figure 7-6. Ten highest and lowest states in number of authorized privately owned building permits, based on 2006 ranking
United States and Washington state, 2006 and 2013
Source: U.S. Census Bureau

Rank	State	2006 building permits	2013 building permits	Percent change 2006 through 2013
	United States	**1,838,903**	**829,658**	**-54.9%**
1	Texas	216,642	135,514	-37.4%
2	Florida	203,238	64,810	-68.1%
3	California	160,502	58,549	-63.5%
4	Georgia	104,200	24,350	-76.6%
5	North Carolina	99,979	48,692	-51.3%
6	Arizona	65,363	21,726	-66.8%
7	Illinois	58,802	13,797	-76.5%
8	New York	54,382	24,872	-54.3%
9	South Carolina	50,776	18,708	-63.2%
10	**Washington**	**50,033**	**28,118**	**-43.8%**
42	New Hampshire	5,677	2,296	-59.6%
43	West Virginia	5,645	2,718	-51.9%
44	South Dakota	5,304	4,178	-21.2%
45	Montana	4,542	2,736	-39.8%
46	Wyoming	3,537	2,110	-40.3%
47	North Dakota	3,529	10,340	193.0%
48	Alaska	2,739	994	-63.7%
49	Vermont	2,626	1,301	-50.5%
50	Rhode Island	2,370	731	-69.2%
51	District of Columbia	2,105	3,823	81.6%

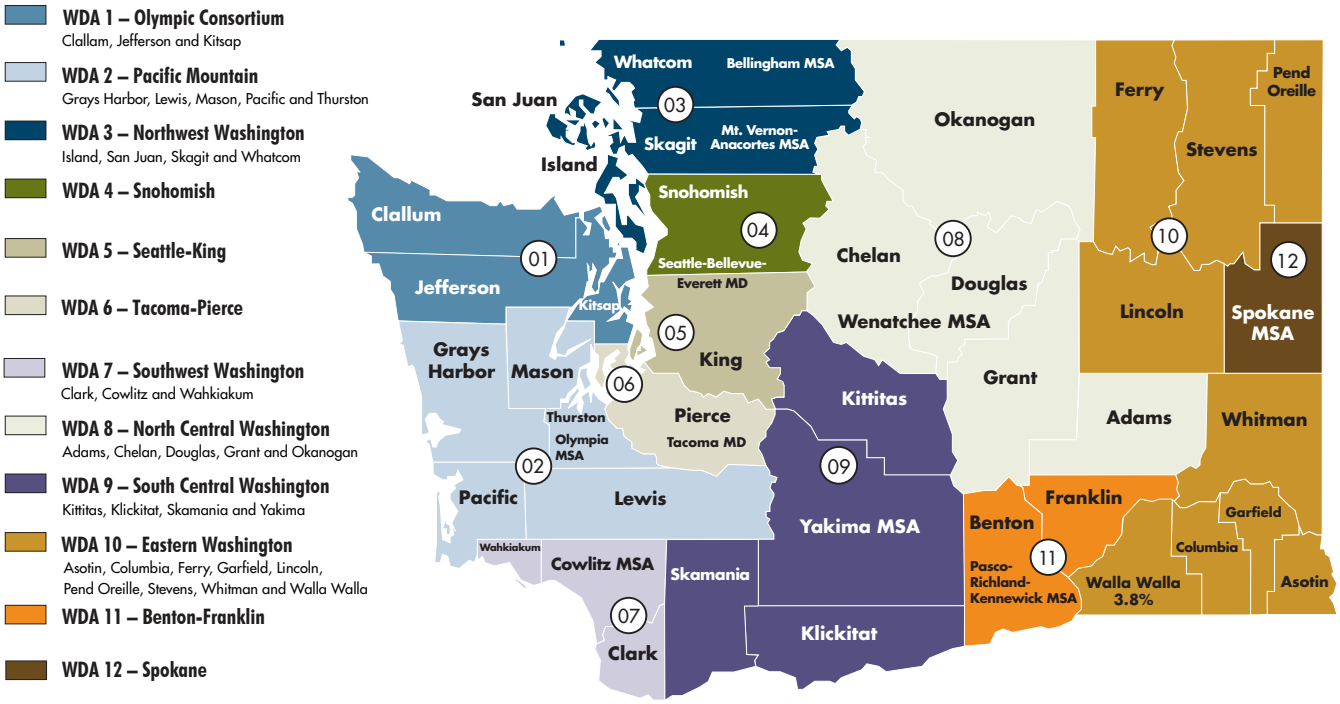
Figure 7-7. Median single-family house prices in thousands, based on 2006 ranking
Selected U.S. metropolitan areas, 2006 and 2013
Source: National Association of Realtors

Home Prices

Rank	Metropolitan area	2006	2013	Percent change 2006 to 2013
	United States	**221.9**	**197.4**	**-11.0%**
1	San Jose-Sunnyvale-Santa Clara, CA	775.0	780.0	0.6%
2	San Francisco-Oakland-Fremont, CA	752.8	679.2	-9.8%
3	Anaheim-Santa Ana-Irvine, CA	709.0	651.6	-8.1%
4	Honolulu, HI	630.0	661.5	5.0%
5	San Diego-Carlsbad-San Marcos, CA	601.8	464.3	-22.8%
6	Los Angeles-Long Beach-Santa Ana, CA	584.8	405.6	-30.6%
7	New York-Wayne-White Plains, NY-NJ	539.4	465.7	-13.7%
8	NY: Nassau-Suffolk, NY	474.7	396.8	-16.4%
20	**Seattle-Tacoma-Bellevue, WA**	**361.2**	**336.3**	**-6.9%**
28	Portland-Vancouver-Beaverton, OR-WA	280.8	265.5	-5.4%
54	Salem, OR	212.9	168.5	-20.9%
66	**Spokane, WA**	**184.1**	**174.2**	**-5.4%**
78	**Kennewick-Richland-Pasco, WA**	**156.1**	**186.6**	**19.5%**
108	**Yakima, WA**	**136.5**	**160.0**	**17.2%**
147	Cumberland, MD-WV	95.7	102.2	6.8%
148	South Bend-Mishawaka, IN	92.7	95.2	2.7%
149	Elmira, NY	86.8	111.1	28.0%
150	Decatur, IL	85.4	84.8	-0.7%
151	Youngstown-Warren-Boardman, OH-PA	81.5	67.0	-17.8%

Appendix 1: Washington's workforce development areas

Appendix figure A1-1. Washington State Workforce Development Areas (WDAs)



Appendix 2: Seasonal, structural and cyclical industry employment

To identify the major factors of monthly employment changes, we used the U.S. Census Bureau's X-12-ARIMA seasonal adjustment software to break our time series into three components: seasonal, trend (structural)-cycle and irregular. We then used the Hodrick-Prescott filter to separate trend and cycle components from trend-cycle series.

We used a multiplicative seasonal adjustment option of the Census software. Decomposition of employment for each point of time (month, for our case) is:

$$\text{Employment} = (\text{trend} + \text{cycle}) \times \text{seasonal} \times \text{irregular}$$

Such decomposition allows us to identify the contribution of trend and cycle components to employment growth, while seasonal and irregular components are maintained as equal multipliers for each factor.

Alternatively, we used the default series diagnostic test from the SAS Time Series Forecasting System. A seasonal dummy model with AR(1) errors was fit and the joint significance of seasonal dummy estimates was tested. If the seasonal dummies were significant, the Akaike Information Criterion (AIC) statistic for this model was compared to the AIC for the AR(1) model without seasonal dummies. If the AIC for the seasonal model was lower than that of the non-seasonal model, the seasonal option was set to YES. Otherwise the seasonal option was NO and was not used.

We used trend-cycle results from the Census software as the initial series for our analyses of the contributions of structural and cyclical components of growth. To do so, we used the Hodrick-Prescott filter.

The filter is a smoothing method that is widely used among macroeconomists to obtain a smooth estimate of the long-term trend component of a series.

Technically, the Hodrick-Prescott (HP) filter is a two-sided linear filter that computes the smoothed series **s** of **y** by minimizing the variance of **y** around **s**, subject to a penalty that constrains the second difference of **s**. That is, the HP filter chooses s to minimize:

$$\sum_{t=1}^{T} (y_t - s_t)^2 + \lambda \sum_{t=2}^{T-1} (s_{t+1} - s_t) - (s_t - s_{t-1}))^2$$

The penalty parameter λ controls the smoothness of the series **s**. The larger the λ, the smoother the **s**. As $\lambda=\infty$, **s** approaches a linear trend.

We used default value λ=14,400 for monthly frequency of the data. The default value was defined by dividing the number of periods per year by 4 raised to a power (default value 2) and multiplying by 1,600.

The Granger causality test is a technique for determining whether one time series is useful in forecasting another – put another way, answering the question whether a time series "X" causes time series "Y," to see how much of the current "Y" values can be explained by past values of the same series and then to see whether adding lagged values of "X" can improve the explanation.

In this case, the question is whether another variable "Granger causes" changes in employment if the lags for that variable as a group are significant in explaining employment. This could be determined by running the model with all variables, then without the lags for the variable being Granger-analyzed and performing an F-test to see whether there has been a significant change in the amount of explained employment variation.

The results of Granger causality do not necessarily provide a clear story, such as series "X" Granger-causes series "Y," but not the other way around. We can find that neither series Granger-causes the other, or that *each* Granger-causes the other, or that both of them Granger-causes each other.

Moreover, Granger causality does not imply true causality. If both series "X" and "Y" are driven by a common third process (variable, series), but with different lags, there would be Granger causality. However, the changes in one series would not have a significant effect on the other.

Seasonal industries

The level of employment seasonality for an industry is expressed through its seasonal factor value. This factor is defined by the variance between the seasonal factors and 1. The larger the variance becomes, the larger the factor value becomes. The third column in *Appendix figure A2-1* lists the mean absolute percent differences between the monthly seasonal factor and 1, for each industry. To interpret the seasonal factors, arbitrary thresholds were established. Industries with a seasonal factor value of up to 1 percent were identified as non-seasonal. Industries with a factor value greater than 1 and up through 2 percent were identified as having low levels of seasonality. Industries with a factor value greater than 2 and up through 4 percent were identified as having moderate levels of seasonality, while industries with a factor value greater than 4 percent were considered to have high levels of seasonality. The results are listed in column four.

An alternative approach for establishing industry seasonality uses the default series diagnostic test from the SAS Time Series Forecasting System. The main difference is that the first test is based on volume of seasonality while the second one responds to the question of whether including the seasonal factor in the autoregressive model improves the quality of the estimates. Results of the SAS test are presented in column five. All of the industries identified as highly seasonal under the first test are also identified as seasonal by this test.

Structural and cyclical industries

Relative contributions to monthly employment change are calculated as the average for all months of absolute differences for specific factors (presented in columns six and seven of the table in *Appendix figure A2-1*). The percentages of relative contributions for trend (structural) and cycle components are presented in columns eight and nine. The industry that had the lowest cyclical component contribution (31.4 percent) was software publishers, while scenic and sightseeing transportation, support activities for mining and crop production had the highest cyclical component contribution (at least 80 percent). The structural component accounted for the dominant share of change in total employment (60.2 percent), while the cyclical component accounted for the residual 39.8 percent.

The last four columns of the table represent an attempt to connect the employment trends for specific industries with the trends for total covered employment. The first of these four columns represents correlations of trend-cycle series of monthly employment between industries and total employment, while the second one represents correlations of the first differences (monthly changes) for the same series.

The second-to-last column of the table represents an attempt to identify the industries for which monthly employment changes could help in predicting the next month's changes in total employment. F statistics from the Granger causality test for differences in trend-cycle series with a lag of one month are presented in this column. The value of "F" indicates the significance of the impact of employment changes in the industry on the next month's employment changes in total employment. Larger values indicate effects that were more significant. F-statistics probabilities used to test for the significance of the effects are listed in the last column. A lower probability indicates higher confidence that the effect is significant.

The results of the last four columns show that the combination of high predictive abilities and statistical correlation with total employment change is greatest in the following industries: administrative and support services, nonmetallic mineral product manufacturing and specially trade contractors.

Appendix figure A2-1. Seasonal, structural (trend) and cyclical components of industries
Washington state, 1990 through 2013
Source: Employment Security Department/LMPA; U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

NAICS	Industries	Seas. factor	Level of seas.	SAS Seas. Ident.	Trend (average number)	Cycle (average number)	Trend (percent)	Cycle (percent)	Correlation with total employ.	Correlation of first differences	F-statistic for Granger test (1-month lag)	Probability
	Total covered employment	**1.6%**	**Low**	**YES**	**3,733**	**2,468**	**60.2%**	**39.8%**	**100.0%**	**100.0%**		
111	Crop production	34.0%	High	YES	94	413	18.5%	81.5%	36.3%	17.8%	5.41	0.02
112	Animal production	3.0%	Mod	YES	7	24	21.9%	78.1%	75.8%	9.5%	0.00	0.99
113	Forestry and logging	3.4%	Mod	YES	23	30	43.9%	56.1%	-87.5%	27.3%	0.26	0.61
114	Fishing, hunting and trapping	8.0%	High	YES	7	16	29.2%	70.8%	-94.9%	1.2%	5.43	0.02
115	Support activities for agriculture and forestry	14.7%	High	YES	43	102	29.8%	70.2%	93.5%	10.6%	11.19	0.00
212	Mining (except oil and gas)	4.0%	Mod	YES	11	13	44.9%	55.1%	-44.0%	47.8%	2.57	0.11
213	Support activities for mining	7.8%	High	YES	1	5	16.8%	83.2%	-72.2%	-1.6%	0.03	0.86
221	Utilities	0.9%	NS	NO	10	24	28.2%	71.8%	-73.7%	-0.7%	1.81	0.18
236	Construction of buildings	3.5%	Mod	YES	137	137	50.0%	50.0%	52.3%	73.2%	32.10	0.00
237	Heavy and civil engineering construction	9.0%	High	YES	54	70	43.5%	56.5%	49.1%	62.7%	24.95	0.00
238	Specialty trade contractors	3.8%	Mod	YES	357	273	56.7%	43.3%	84.0%	83.9%	14.80	0.00
311	Food manufacturing	4.9%	High	YES	39	82	32.2%	67.8%	-64.5%	21.3%	1.57	0.21
312	Beverage and tobacco product manufacturing	4.4%	High	YES	13	15	46.5%	53.5%	74.9%	20.3%	1.31	0.25
313	Textile mills	1.5%	Low	NO	2	5	29.7%	70.3%	-86.1%	17.9%	3.63	0.06
314	Textile product mills	1.5%	Low	YES	8	10	44.0%	56.0%	-59.0%	33.1%	2.91	0.09
315	Apparel manufacturing	2.6%	Mod	YES	17	21	44.7%	55.3%	-81.5%	28.9%	0.66	0.42
316	Leather and allied product manufacturing	3.1%	Mod	NO	1	4	27.6%	72.4%	-86.8%	0.1%	0.39	0.53
321	Wood product manufacturing	1.4%	Low	YES	59	74	44.5%	55.5%	-75.6%	55.8%	22.73	0.00
322	Paper manufacturing	1.0%	NS	YES	32	37	46.8%	53.2%	-85.4%	17.1%	0.96	0.33
323	Printing and related support activities	0.8%	NS	YES	31	27	53.1%	46.9%	-76.8%	45.4%	0.23	0.64

NAICS	Industries	Seas. factor	Level of seas.	SAS Seas. Ident.	Trend (average number)	Cycle (average number)	Trend (percent)	Cycle (percent)	Correlation with total employ.	Correlation of first differences	F-statistic for Granger test (1-month lag)	Probability
324	Petroleum and coal products manufacturing	1.9%	Low	YES	3	10	26.4%	73.6%	38.0%	-2.2%	0.99	0.32
325	Chemical manufacturing	0.7%	NS	NO	15	19	43.9%	56.1%	41.7%	43.8%	0.62	0.43
326	Plastics and rubber products manufacturing	1.3%	Low	YES	28	31	47.4%	52.6%	44.9%	61.9%	7.04	0.01
327	Nonmetallic mineral product manufacturing	2.5%	Mod	YES	21	29	42.4%	57.6%	82.7%	65.3%	22.34	0.00
331	Primary metal manufacturing	0.5%	NS	NO	44	45	49.5%	50.5%	-80.9%	49.0%	0.65	0.42
332	Fabricated metal product manufacturing	1.1%	Low	YES	51	58	46.9%	53.1%	76.5%	75.9%	21.09	0.00
333	Machinery manufacturing	0.7%	NS	NO	54	54	50.4%	49.6%	68.2%	71.5%	4.81	0.03
334	Computer and electronic product manufacturing	0.4%	NS	YES	99	104	48.7%	51.3%	-47.5%	59.7%	0.10	0.76
335	Electrical equipment, appliance and component manufacturing	0.7%	NS	NO	12	17	41.9%	58.1%	96.7%	49.2%	1.35	0.25
3364	Aerospace product and parts manufacturing	0.5%	NS	NO	430	547	44.0%	56.0%	-54.2%	31.6%	5.59	0.02
3366	Ship and boat building	0.6%	NS	NO	42	51	45.1%	54.9%	-17.1%	20.7%	1.75	0.19
336*	Other transportation equipment manufacturing	1.0%	NS	YES	30	34	46.7%	53.3%	-35.7%	35.6%	3.52	0.06
337	Furniture and related product manufacturing	1.4%	Low	YES	24	29	45.7%	54.3%	-23.7%	78.1%	5.33	0.02
339	Miscellaneous manufacturing	1.3%	Low	YES	21	30	41.2%	58.8%	63.5%	40.6%	8.34	0.00
423	Merchant wholesalers, durable goods	0.6%	NS	YES	118	99	54.4%	45.6%	81.8%	79.8%	0.19	0.66
424	Merchant wholesalers, nondurable goods	1.8%	Low	YES	45	67	40.2%	59.8%	72.7%	54.3%	1.30	0.26

NAICS	Industries	Seas. factor	Level of seas.	SAS Seas. Ident.	Trend (average number)	Cycle (average number)	Trend (percent)	Cycle (percent)	Correlation with total employ.	Correlation of first differences	F-statistic for Granger test (1-month lag)	Probability
425	Wholesale electronic markets and agents and brokers	1.0%	NS	YES	66	43	60.7%	39.3%	64.1%	-6.6%	0.67	0.41
441	Motor vehicle and parts dealers	1.2%	Low	YES	63	70	47.4%	52.6%	70.2%	61.5%	19.20	0.00
442	Furniture and home furnishings stores	1.9%	Low	YES	25	31	44.5%	55.5%	66.9%	63.4%	18.72	0.00
443	Electronics and appliance stores	2.5%	Mod	YES	20	47	29.7%	70.3%	67.2%	38.3%	3.67	0.06
444	Building material and garden equipment and supplies dealers	3.7%	Mod	YES	50	71	41.4%	58.6%	92.5%	56.0%	9.32	0.00
445	Food and beverage stores	1.5%	Low	YES	74	122	37.7%	62.3%	22.0%	8.0%	0.56	0.46
446	Health and personal care stores	1.3%	Low	YES	12	32	26.8%	73.2%	88.5%	26.9%	1.46	0.23
447	Gasoline stations	1.9%	Low	YES	19	23	45.7%	54.3%	-52.1%	30.4%	0.89	0.35
448	Clothing and clothing accessories stores	4.6%	High	YES	59	98	37.7%	62.3%	29.8%	63.7%	7.13	0.01
451	Sporting goods, hobby, book and music stores	3.8%	Mod	YES	34	43	43.8%	56.2%	65.1%	52.2%	0.00	0.95
452	General merchandise stores	3.9%	Mod	YES	161	169	48.8%	51.2%	92.5%	9.7%	2.74	0.10
453	Miscellaneous store retailers	2.0%	Low	YES	46	33	57.9%	42.1%	43.3%	49.6%	6.38	0.01
454	Nonstore retailers	1.5%	Low	YES	85	61	58.1%	41.9%	84.4%	33.7%	0.63	0.43
481	Air transportation	0.9%	NS	YES	33	38	46.2%	53.8%	-37.9%	44.2%	0.43	0.51
483	Water transportation	3.5%	Mod	YES	5	15	26.4%	73.6%	28.3%	10.9%	0.09	0.76
484	Truck transportation	2.5%	Mod	YES	40	49	44.7%	55.3%	84.4%	67.3%	4.59	0.03
485	Transit and ground passenger transportation	3.1%	Mod	YES	12	21	37.0%	63.0%	97.0%	11.4%	1.60	0.21
486	Pipeline transportation	0.8%	NS	NO	1	2	24.7%	75.3%	-81.1%	3.3%	0.80	0.37

NAICS	Industries	Seas. factor	Level of seas.	SAS Seas. Ident.	Trend (average number)	Cycle (average number)	Trend (percent)	Cycle (percent)	Correlation with total employ.	Correlation of first differences	F-statistic for Granger test (1-month lag)	Probability
487	Scenic and sightseeing transportation	16.0%	High	YES	3	15	15.2%	84.8%	-73.2%	4.7%	1.94	0.16
488	Support activities for transportation	1.1%	Low	NO	29	58	33.7%	66.3%	95.1%	35.8%	2.34	0.13
4911	Postal service	1.0%	Low	YES	28	30	48.3%	51.7%	-10.2%	40.9%	0.98	0.32
492	Couriers and messengers	4.1%	High	YES	37	63	37.2%	62.8%	68.7%	39.7%	0.57	0.45
493	Warehousing and storage	3.5%	Mod	YES	32	65	33.4%	66.6%	-21.1%	11.2%	0.53	0.47
5112	Software publishers	0.8%	NS	YES	166	76	68.6%	31.4%	97.0%	37.0%	2.84	0.09
511*	Other publishers	0.5%	NS	YES	37	36	50.6%	49.4%	-30.3%	46.7%	1.02	0.31
512	Motion picture and sound recording industries	4.4%	High	YES	13	31	29.2%	70.8%	80.9%	33.7%	0.40	0.53
515	Broadcasting (except internet)	0.8%	NS	YES	7	16	29.9%	70.1%	-80.5%	32.8%	1.25	0.26
5171	Wired telecomms. carriers	0.7%	NS	NO	52	55	48.4%	51.6%	-66.5%	30.1%	0.53	0.47
5172	Wireless telecomms. carriers (exc. satellite)	0.9%	NS	NO	55	59	48.2%	51.8%	91.9%	8.4%	0.06	0.81
517*	Other telecomms.	1.7%	Low	NO	31	48	39.1%	60.9%	-18.8%	-7.9%	0.76	0.38
518	Data processing, hosting and related services	0.6%	NS	NO	26	49	35.2%	64.8%	45.4%	20.5%	0.58	0.45
519	Other information services	2.4%	Mod	NO	33	33	49.8%	50.2%	69.8%	19.9%	2.19	0.14
521	Monetary authorities central bank	0.7%	NS	NO	1	1	34.9%	65.1%	-62.2%	40.6%	2.90	0.09
522	Credit intermediation and related activities	0.3%	NS	YES	111	137	44.9%	55.1%	60.8%	21.4%	0.10	0.75
523	Securities, commodity contracts and other financial investments and related activities	0.5%	NS	YES	27	29	48.5%	51.5%	94.9%	46.3%	0.32	0.57

NAICS	Industries	Seas. factor	Level of seas.	SAS Seas. Ident.	Trend (average number)	Cycle (average number)	Trend (percent)	Cycle (percent)	Correlation with total employ.	Correlation of first differences	F-statistic for Granger test (1-month lag)	Probability
524	Insurance carriers and related activities	0.3%	NS	YES	50	82	38.0%	62.0%	76.1%	26.9%	0.27	0.60
525	Funds, trusts and other financial vehicles	2.6%	Mod	YES	6	10	36.6%	63.4%	-93.8%	-4.9%	1.10	0.29
531	Real estate	1.5%	Low	YES	54	56	49.1%	50.9%	95.7%	34.9%	3.56	0.06
532	Rental and leasing services	2.2%	Mod	YES	34	25	57.7%	42.3%	16.6%	51.4%	0.04	0.83
533	Lessors of nonfinancial intangible assets (except copyrighted works)	2.4%	Mod	NO	4	5	41.2%	58.8%	31.4%	40.7%	1.00	0.32
541	Professional, scientific and technical services	0.4%	NS	YES	304	265	53.5%	46.5%	96.2%	67.5%	1.41	0.24
551	Management of companies and enterprises	0.4%	NS	NO	94	110	46.0%	54.0%	80.2%	29.9%	0.76	0.38
561	Administrative and support services	3.2%	Mod	YES	385	365	51.3%	48.7%	97.6%	74.0%	50.84	0.00
562	Waste management and remediation service	0.9%	NS	YES	35	53	39.8%	60.2%	20.8%	-2.1%	5.13	0.02
611	Educational services	4.8%	High	YES	321	260	55.2%	44.8%	97.5%	9.7%	0.52	0.47
621	Ambulatory healthcare services	0.3%	NS	YES	225	128	63.7%	36.3%	92.3%	-3.2%	9.09	0.00
622	Hospitals	0.3%	NS	YES	162	126	56.3%	43.7%	93.8%	-11.5%	6.40	0.01
623	Nursing and residential care facilities	0.4%	NS	YES	80	74	52.1%	47.9%	94.5%	-7.9%	6.63	0.01
624	Social assistance	0.9%	NS	YES	162	128	55.8%	44.2%	95.4%	20.0%	3.02	0.08
711	Performing arts, spectator sports and related industries	8.7%	High	YES	19	53	26.4%	73.6%	14.4%	8.6%	0.93	0.34
712	Museums, historical sites and similar institution	3.4%	Mod	YES	6	11	37.2%	62.8%	96.0%	36.7%	0.05	0.82

NAICS	Industries	Seas. factor	Level of seas.	SAS Seas. Ident.	Trend (average number)	Cycle (average number)	Trend (percent)	Cycle (percent)	Correlation with total employ.	Correlation of first differences	F-statistic for Granger test (1-month lag)	Probability
713	Amusement, gambling and recreation industries	4.5%	High	YES	79	89	47.0%	53.0%	96.5%	35.0%	4.94	0.03
721	Accommodation, including hotels and motels	5.8%	High	YES	40	71	36.1%	63.9%	95.7%	46.2%	0.41	0.52
722	Food services and drinking places	2.1%	Mod	YES	302	251	54.7%	45.3%	98.5%	75.0%	6.71	0.01
811	Repair and maintenance	1.0%	NS	YES	35	48	42.2%	57.8%	66.8%	54.1%	16.25	0.00
812	Personal and laundry services	1.1%	Low	YES	34	28	54.7%	45.3%	91.9%	57.8%	0.21	0.65
813	Religious, grantmaking, civic, professional and similar organizations	2.2%	Mod	YES	34	40	45.5%	54.5%	95.7%	28.1%	11.48	0.00
814	Private households	2.3%	Mod	YES	229	214	51.7%	48.3%	91.8%	-20.2%	0.00	0.97
910*	federal government employment (other)	1.5%	Low	YES	65	145	31.1%	68.9%	31.4%	-15.8%	2.65	0.10
920	State government, excluding education and hospitals	1.1%	Low	YES	56	102	35.6%	64.4%	87.5%	14.9%	6.13	0.01
930	Local government, excluding education and hospitals	2.2%	Mod	YES	213	168	55.9%	44.1%	95.7%	4.3%	7.81	0.01

Mod = Moderate
NS = Not Seasonal
Seas. = Seasonal/Seasonality
Ident. = Identification