

Oklahoma Employment in the Past Two Recessions: an Analysis Using QWI, 2001-2009



Oklahoma Employment in the Past Two Recessions: An Analysis Using QWI, 2001-2009

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Oklahoma Employment in the Past Two Recessions

Introduction

According to the National Bureau of Economic Research (NBER) Business Cycle Dating Committee, the most recent ‘Great Recession’ officially began in December 2007 and ended in June 2009. That recession lasted 18 months, making it the longest of any recession since World War II. The previous recession which began in March 2001 and ended in November 2001 only lasted 8 months—slightly less than average for recessions since World War II.

To better understand how the past two recessions affected Oklahoma in terms of employment, we are using the Census Bureau’s Quarterly Workforce Indicators (QWI) data for employment, hires, and separations. The QWI are built upon wage records from OESC’s Unemployment Insurance (UI) system and demographic information from the Census Bureau. The universe of QWI data is UI-covered earnings. UI coverage is broad, covering over 90 percent of total wage and salary civilian jobs. However, there are some limitations to QWI data. Federal government employment is not generally included. Exempted employment generally excludes many farmers and agricultural employees, domestic workers, self-employed non-agricultural workers, members of the Armed Services, some state and local government employees as well as certain types of nonprofit employers and religious organizations. The QWI can be queried by different levels of geography (state, county, metro, and workforce investment area), as well as by detailed industry, gender, and age of workers making it a rich source for gaining insight into the labor market.

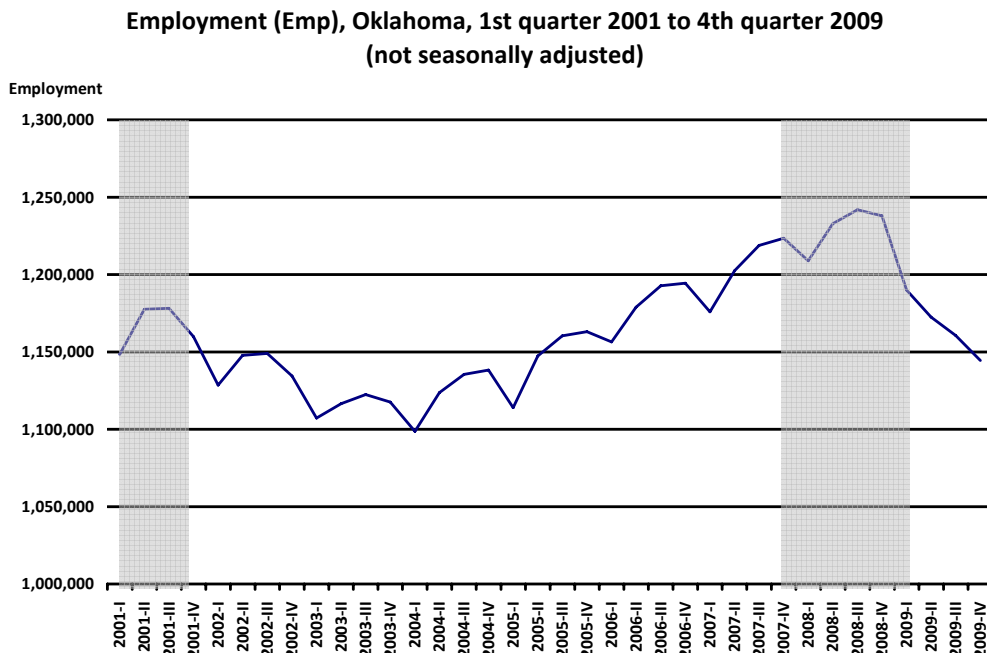
The QWI measure of employment (Emp) defined as ‘the total number of workers who were employed by a given employer on the first calendar day of the reference quarter’ will be used in this study.

Overview

From 3rd quarter 2008, the peak point of employment in the past nine years, to 4th quarter 2009, non-seasonally adjusted employment in Oklahoma fell by nearly 100,000 jobs. This large decline in employment reflects the influence of the recession on the Oklahoma economy.

See Chart 1 below (the shaded areas represent the past two recessions).

Chart 1

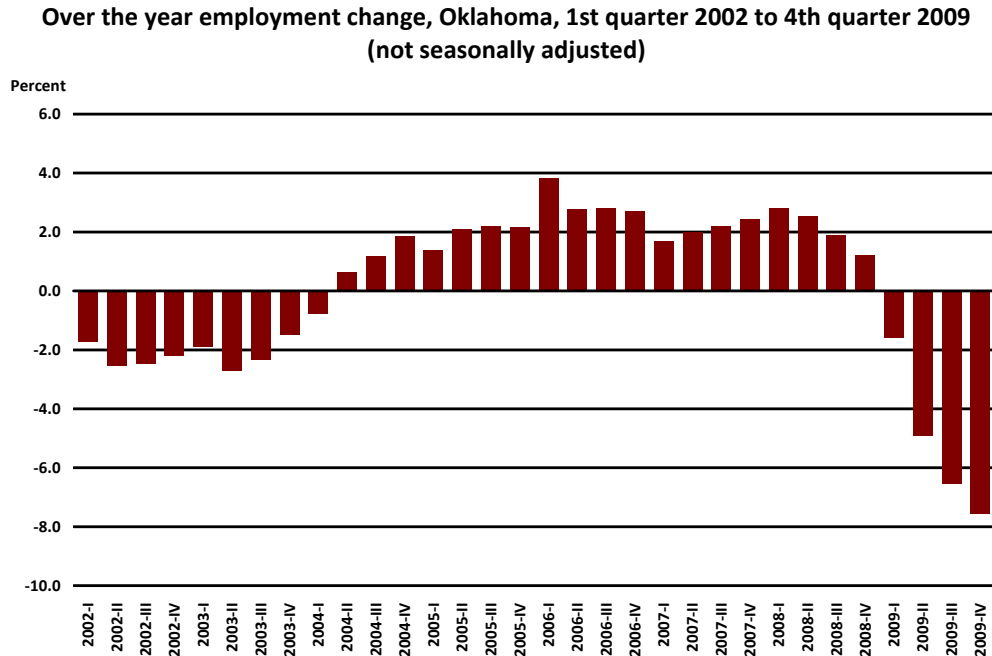


Source: Local Employment Dynamics (LED), Quarterly Workforce Indicators (QWI), U.S. Census Bureau, 2010.

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Chart 2 below shows over-the-year employment change (not seasonally adjusted) in Oklahoma during the past eight years. Employment exhibited negative growth from 1st quarter 2002 to 1st quarter 2004. From 2nd quarter 2004 up to 4th quarter 2008, Oklahoma saw positive employment growth. After that, employment returned to negative growth. In 4th quarter 2009, employment in Oklahoma declined by 7.5 percent compared to 4th quarter 2008—the greatest negative growth in employment over the past eight years.

Chart 2



Source: Local Employment Dynamics (LED), Quarterly Workforce Indicators (QWI), U.S. Census Bureau, 2010.

Gender

It has been pointed out that the past two recessions have disproportionately hurt men, who are more likely to work in cyclically sensitive industries like manufacturing and construction. Women, on the other hand, are overrepresented in more downturn-resistant sectors like education and health care. As a result, women gained a larger employment share. Using QWI, we are able to assess if that has been the case in Oklahoma.

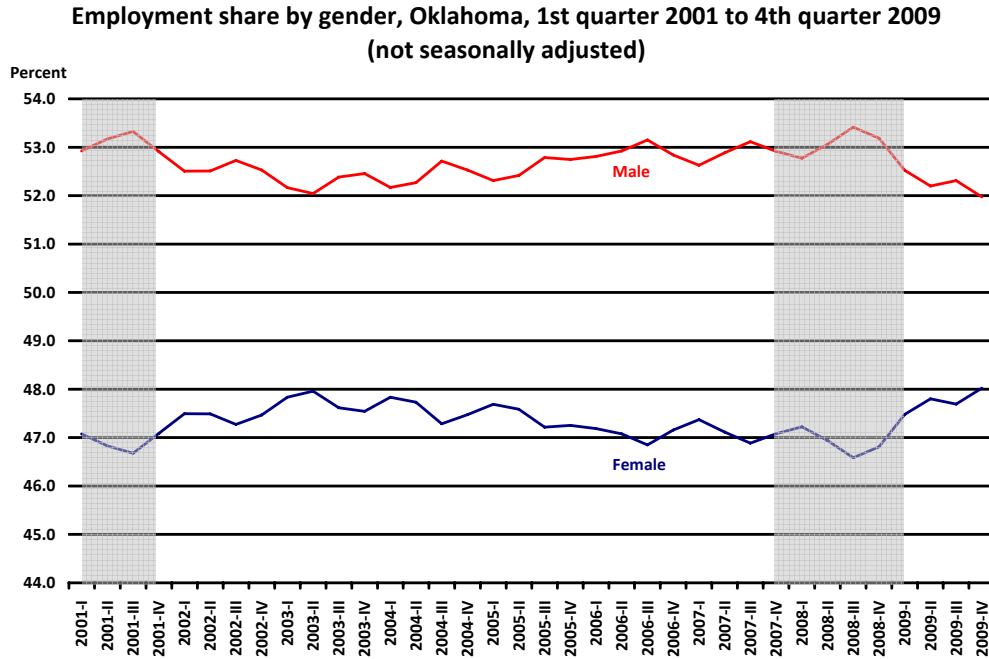
In the 3rd quarter 2008, males accounted for approximately 53 percent and females 47 percent of total employment in Oklahoma. Since then, the male share of employment has been shrinking while the female share has been growing. By 4th quarter 2009, the male share of employment was about 52 percent while the female share was about 48 percent of total employment.

The latest recession seems to have affected males more adversely than females in Oklahoma.

Chart 3 below shows the variations (the shaded areas represent the past two recessions).

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Chart 3

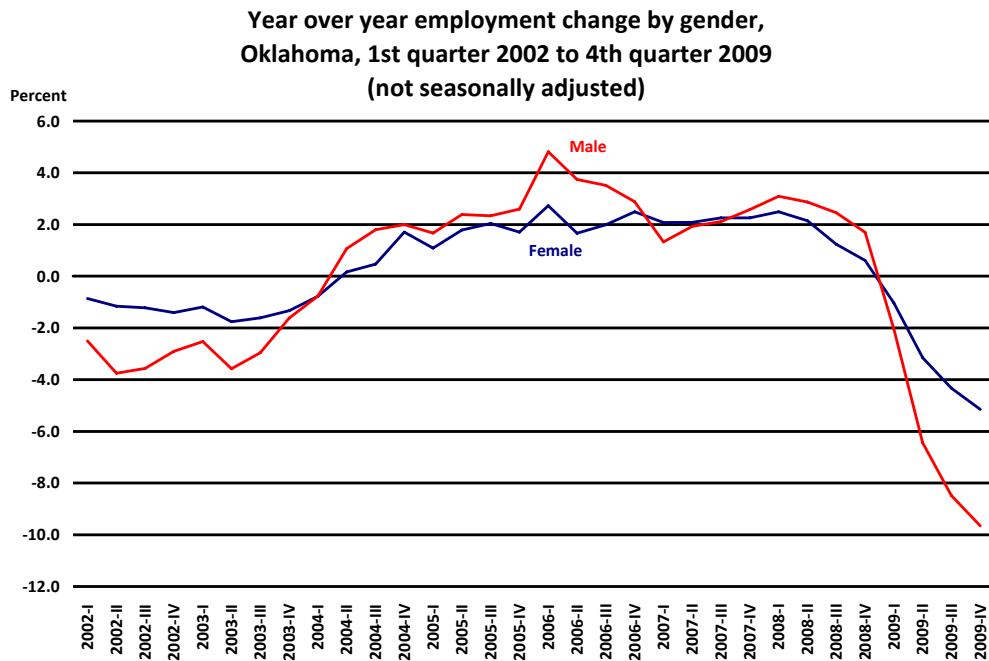


Source: Local Employment Dynamics (LED), Quarterly Workforce Indicators (QWI), U.S. Census Bureau, 2010.

The larger job loss in male employment since 1st quarter 2009 is illustrated in Chart 4.

From the beginning of the recession in 4th quarter 2007 to 4th quarter 2008, male employment in Oklahoma grew more rapidly than female employment. However, the situation reversed after 4th quarter 2008 as male employment began to fall sharply compared to the same quarter in the previous year (4th quarter 2007). This negative change was much less pronounced for females.

Chart 4



Source: Local Employment Dynamics (LED), Quarterly Workforce Indicators (QWI), U.S. Census Bureau, 2010.

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Employment Share by Industry

Looking at employment share by industry¹, since the start of the last recession, up to 4th quarter 2009, manufacturing was more negatively affected than any other industry in Oklahoma. At the onset of the recession (4th quarter 2007), manufacturing accounted for approximately 12.4 percent of total employment but by 4th quarter 2008, manufacturing accounted for 12.1 percent of employment share, declining 0.3 percent. By 4th quarter 2009, manufacturing's share of total employment stood at 10.7 percent, contracting 1.43 percent compared to 4th quarter 2008. The transportation and warehousing; real estate and rental and leasing; and educational services sectors also lost employment share for two consecutive years.

Utilities, by contrast, showed a large increase in employment share in the two year period from 4th quarter 2007 to 4th quarter 2009. Three other industries, including professional, scientific, and technical services; management of companies and enterprises; and health care and social assistance also increased their employment shares during the same time period. It should also be noted that part of the increase in employment share of agriculture, forestry, fishing and hunting and decreases in manufacturing and arts, entertainment, and recreation in 2009 were non-economic and due to code changes. See Table 1 below.

Table 1

Employment share by industry & over-the-year changes (not seasonally adjusted)

Industry	Employment share			Over-the-year change	
	2007 Q4	2008 Q4	2009 Q4	2007-08	2008-09
Agriculture, forestry, fishing and hunting	0.60%	0.57%	0.90%	-4.8%	56.6%
Mining, quarrying, and oil and gas extraction	3.83%	4.30%	3.48%	12.4%	-19.2%
Utilities	0.76%	0.95%	1.05%	24.4%	11.0%
Construction	5.87%	6.02%	5.62%	2.5%	-6.7%
Manufacturing	12.38%	12.12%	10.69%	-2.1%	-11.8%
Wholesale trade	5.13%	4.95%	5.06%	-3.5%	2.1%
Retail trade	13.70%	13.68%	14.49%	-0.1%	5.9%
Transportation and warehousing	3.70%	3.62%	3.47%	-2.3%	-4.0%
Information	2.40%	2.17%	2.45%	-9.6%	13.0%
Finance and insurance	4.78%	4.68%	5.07%	-2.0%	8.2%
Real estate and rental and leasing	1.97%	1.90%	1.90%	-3.6%	-0.1%
Professional, scientific, and technical services	5.14%	5.17%	5.20%	0.6%	0.5%
Management of companies and enterprises	1.11%	1.15%	1.19%	3.6%	3.3%
Administrative & support and waste management & remediation services	8.51%	8.59%	7.70%	0.9%	-10.4%
Educational services	1.15%	1.15%	1.03%	-0.2%	-10.5%
Health care and social assistance	14.47%	14.54%	15.85%	0.5%	9.0%
Arts, entertainment, and recreation	1.43%	1.49%	1.24%	3.9%	-16.9%
Accommodation and food services	9.89%	9.81%	10.43%	-0.8%	6.3%
Other services (except public administration)	3.17%	3.12%	3.19%	-1.4%	2.2%

Source: Local Employment Dynamics (LED), Quarterly Workforce Indicators (QWI), U.S. Census Bureau, 2010.

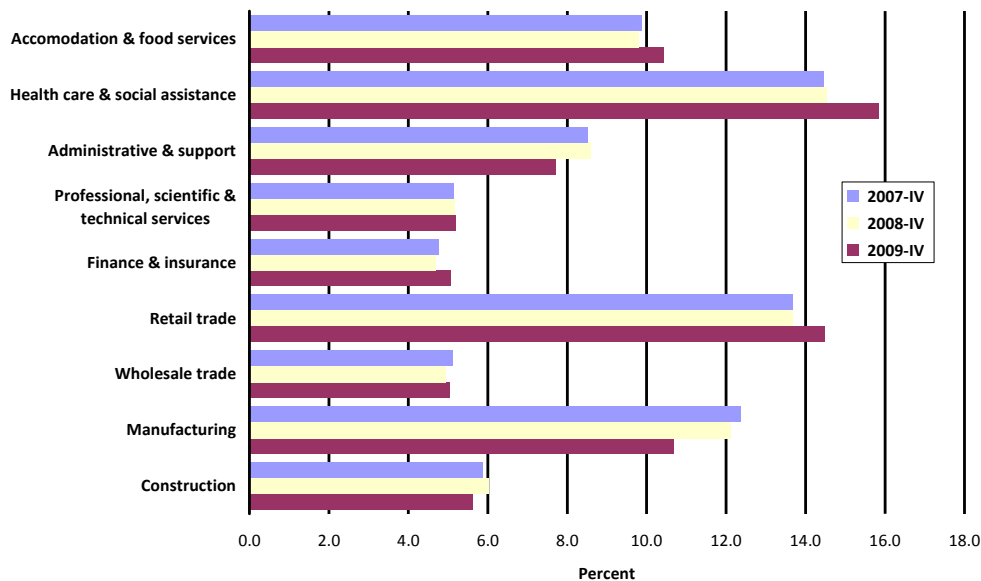
¹ See Appendix regarding the North American Industry Classification System (NAICS).

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Chart 5 shows the change in employment share for the top nine industries with the highest concentration of employment for 4th quarter 2007, 2008 and 2009 (not seasonally adjusted). Of the nine industries, five (retail trade; finance and insurance; professional, scientific, and technical services; health care and social assistance; and accommodation and food services) expanded their employment shares from 4th quarter 2007 to 4th quarter 2009. Employment shares in the remaining four industries (construction; manufacturing; wholesale trade; and administrative and support and waste management and remediation services) all contracted during the same time period.

Chart 5

Employment share by selected industries, Oklahoma, 4th quarter 2007, 2008 and 2009 (not seasonally adjusted)



Source: Local Employment Dynamics (LED), Quarterly Workforce Indicators (QWI), U.S. Census Bureau, 2010.

Job Loss Comparison: Service-Providing & Goods-Producing Sectors, Two Recessions

Goods-producing sectors² include four industries and service-providing sectors include 16 industries. In Oklahoma, service-providing sectors as a group have been gaining share of total employment since 2001. During the past nine years, this group's employment share increased from 77.0 percent in 4th quarter 2001 to 79.3 percent in 4th quarter 2009, while the group of goods-producing sectors lost employment share from 23.0 percent in 4th quarter 2001 to 20.7 percent in 4th quarter 2009. The service-providing industry group employs a much larger share of the labor force in Oklahoma than the goods-producing industry group.

Although the service-providing industry group has gained a larger portion of total employment over the past nine years, this group was also more adversely affected by the recent recession than the goods-producing group in terms of job loss. Job loss is computed as an employment gap between a reference quarter and the same quarter of previous year (a negative gap indicating a job loss). Table 2 below looks at the job loss (not seasonally adjusted) that occurred in Oklahoma during 2001 recession and the most current recession respectively.

The 2001 recession began in March 2001 and ended in November 2001. In 3rd and 4th quarter 2001, a total of 9,750 jobs were lost in the service-producing industries, while the goods-producing industries lost 11,620 jobs. So the job loss ratio in terms of service to goods was 0.84 (or 84:100) during 2001 recession in Oklahoma.

² See Appendix

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Table 2

Job loss: Service-providing industries vs. goods-producing industries

Job loss during 2001 recession			Job loss during the 2007-09 recession		
	Service	Goods		Service	Goods
2001 Q3	0	-1,421	2009 Q1	-11,480	-7,467
2001 Q4	-9,750	-10,199	2009 Q2	-32,233	-28,160
Total	-9,750	-11,620	Total	-43,713	-35,627
Job loss ratio = Service: Goods 0.839071			Job loss ratio = Service: Goods 1.226963		

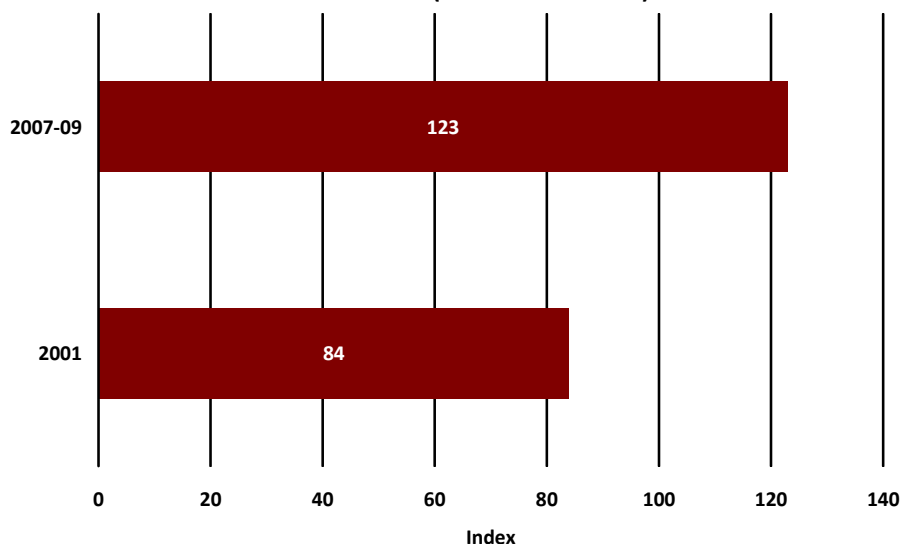
Source: Local Employment Dynamics (LED), Quarterly Workforce Indicators (QWI), U.S. Census Bureau, 2010.
* 2007 Q4 – 2008 Q4: no job loss

During the latest recession that began in December 2007 and ended in June 2009, the service-providing group suffered a greater job loss than the goods-producing group. In the 1st and 2nd quarter of 2009, there were 43,713 jobs lost in the service-providing group and 35,627 jobs lost in the goods-producing group. So the job loss ratio in terms of service to goods is 1.23 (or 123:100) during the latest recession in Oklahoma.

A job loss index, which is obtained based on the job loss ratio, gives a clearer picture of job loss for the goods-producing and service-providing industry group. Treating the job loss for the goods-producing industry group as 100, we can obtain job loss indexes for the group of service-providing industry group, which were 84 and 123 during 2001 and the latest recession respectively. The indexes imply that 84 jobs were lost in service-providing industry group for every 100 jobs lost in goods-producing industry group during the 2001 recession, while there were 123 jobs lost in the services-providing industry group for every 100 jobs lost in goods-producing group during the most recent recession. So, the service-providing industry group suffered a larger job loss during the latest recession than the 2001 recession. See Chart 6 below.

Chart 6

Job loss indexes for the group of service-providing industries during the past two recessions (2001 and 2007-09)



Source: Local Employment Dynamics (LED), Quarterly Workforce Indicators (QWI), U.S. Census Bureau, 2010
* Job loss for goods-producing industry group = 100

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The job loss was even greater for the group of service-providing industries when compared to the time period during and after the two recessions. From 3rd quarter 2001 to 2nd quarter 2002 (four quarters), the group of service-providing industries lost 17,673 jobs while the group of goods-producing industries lost 53,385 jobs. The job loss ratio of service to goods was 0.33 (or 33:100) during and after 2001 recession. During the latest recession, the group of service-providing industries lost a total of 127,588 jobs from 1st quarter to 4th quarter 2009 (four quarters), while this number for the goods-producing sectors was 126,492. The job loss ratio of service to goods was 1.01 (or 101:100) during and after the latest recession. See Table 3 for the details (data not seasonally adjusted).

Table 3
Job loss: Service-providing industries vs. goods-producing industries

Job loss during 2001 recession			Job loss during the 2007-09 recession		
	Service	Goods		Service	Goods
2001 Q3	0	-1,421	2009 Q1	-11,480	-7,467
2001 Q4	-9,750	-10,199	2009 Q2	-32,233	-28,160
2002 Q1	-2,654	-17,150	2009 Q3	-38,645	-42,653
2002 Q2	-5,269	-24,615	2009 Q4	-45,230	-48,212
Total	-17,673	-53,385	Total	-127,588	-126,492
Job loss ratio = Service: Goods 0.331048			Job loss ratio = Service: Goods 1.008665		

Source: Local Employment Dynamics (LED), Quarterly Workforce Indicators (QWI), U.S. Census Bureau, 2010.

* 2007 Q4 – 2008 Q4: no job loss

** Only 2 quarters chosen as the time period after the recession due to data availability.

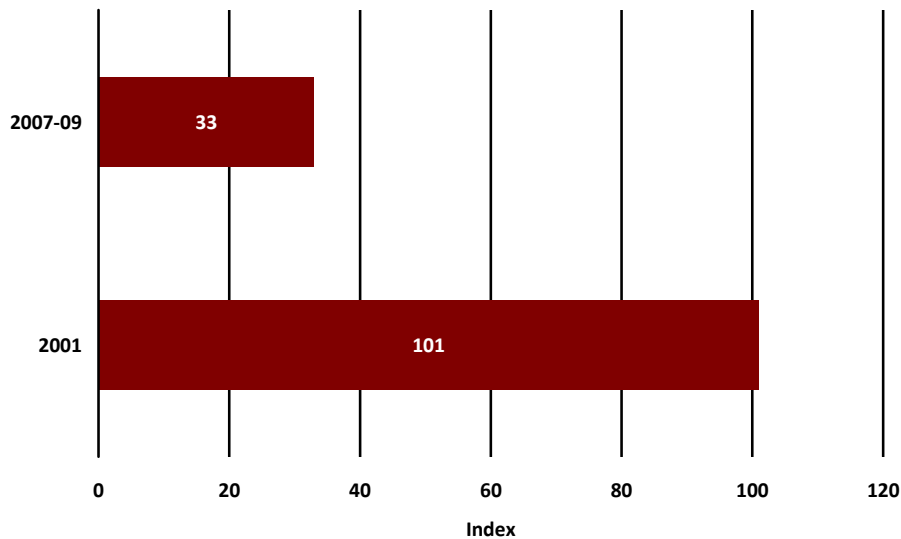
The job loss indexes for the group of service-providing industries in Oklahoma, based on the two job loss ratios in Table 3, were 33 in 2001 and 101 in the latest recession, respectively. Chart 7 below shows the details.

The indexes suggest that during and after 2001 recession, there were only 33 jobs lost in service-providing industries for every 100 jobs lost in goods-producing industries; however, during and after the latest recession, there were 101 job lost in service-providing industries for every 100 job lost in goods-producing industries. So the job loss was much greater for the group of service-providing sectors, compared to the time period during and after 2001 with the time period during and after the most recent recession.

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Chart 7

Job loss indexes for the group of service-providing industries during and after the past two recessions (2001 and 2007-09)



Source: Local Employment Dynamics (LED), Quarterly Workforce Indicators (QWI), U.S. Census Bureau, 2010.

*Job loss for goods-producing industry group = 100

Industry Employment Change: Female vs. Male, 2001 to 2009

Over the past nine years, on average, 73 out of 100 female workers employed came from six industries in Oklahoma: health care and social assistance, retail trade, accommodation and food services, manufacturing, administrative support and waste management and remediation services, and finance and insurance. The share of female employment in the six industries as a group increased by nearly 1 percent from 73.3 percent in 1st quarter 2001 to 74.1 percent in 4th quarter 2009 (not seasonally adjusted). Though the industries that employed a majority of women in Oklahoma remained the same in the past nine years, the composition changed a little bit throughout.

Chart 8 shows the six major industry shares for female employment in Oklahoma during three different time periods (not seasonally adjusted).

The most obvious change is an increase in the employment share of health care and social assistance (NAICS 62)³, together with a drop in that of manufacturing (NAICS 31-33). The former expanded its share of female employment by 4.5 percent, while the latter lost 3.4 percent, from 4th quarter 2001 to 4th quarter 2009. The other four industries, retail trade (NAICS 44-45); accommodation and food services (NAICS 72); administrative services (NAICS 56); and finance and insurance (NAICS 52) had relatively smaller variations in their shares of female employment during the same time period.

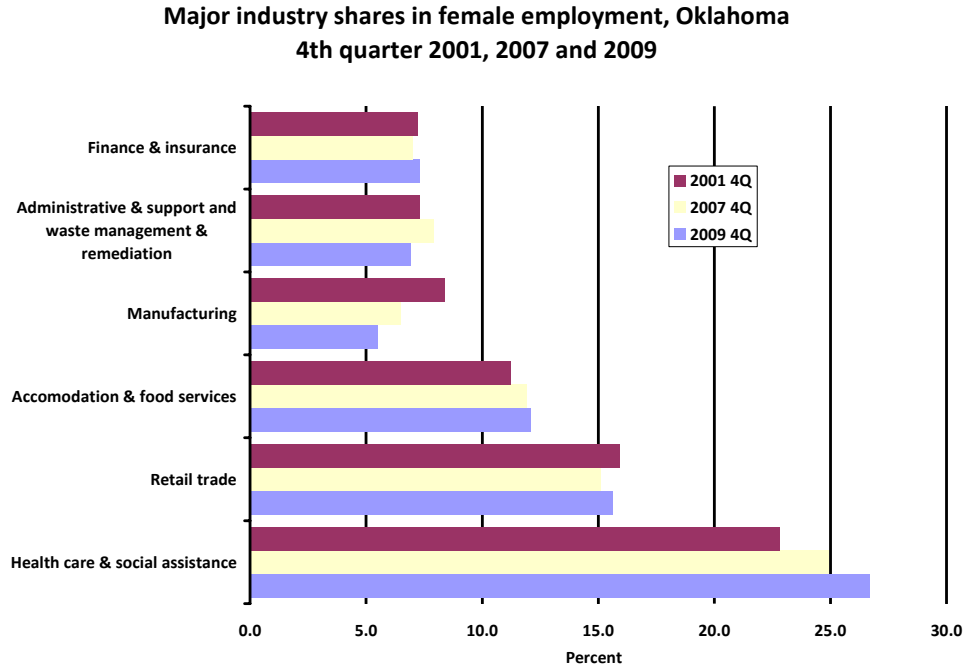
In other words, in the past nine years in Oklahoma, the six major industries that employed a large number of female workers changed some in terms of the composition.

Compared with female employment, there were relatively big changes in the sectors that predominately employed male workers in Oklahoma. Over the past nine years, on average, about 70 out of 100 male workers employed came from seven industries in Oklahoma. These leading industries are manufacturing, retail trade, administrative and support and waste management and

³ See Appendix regarding NAICS (two digit).classifications

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Chart 8

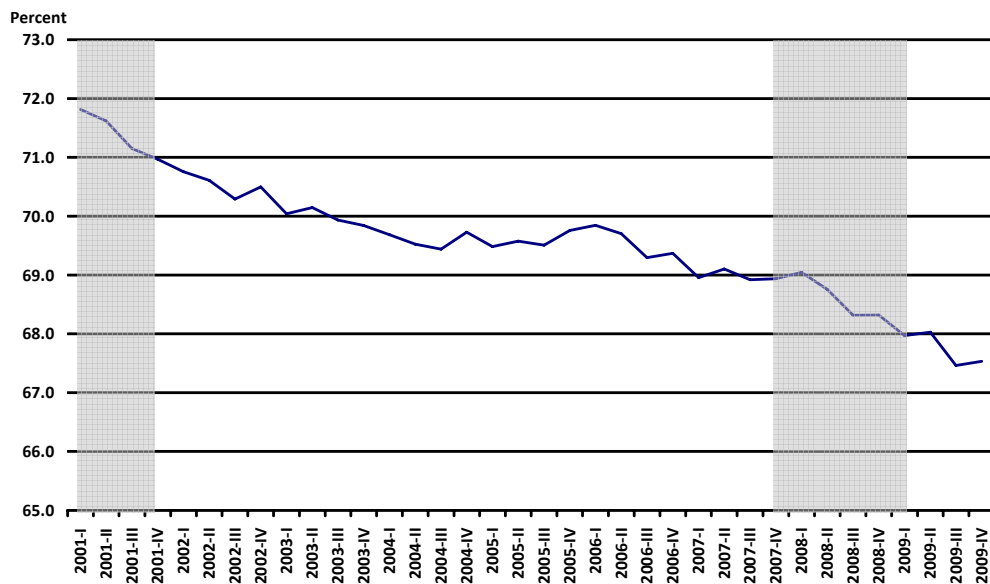


Source: Local Employment Dynamics (LED), Quarterly Workforce Indicators (QWI), U.S. Census Bureau, 2010.

remediation services, construction, accommodation and food services, wholesale trade, and transportation and warehousing. However, the aggregate share of these seven industries as a group in male employment declined from 71.8 percent in 1st quarter 2001 to 67.5 percent in 4th quarter 2009 (not seasonally adjusted). See Chart 9 below for the details (the shaded areas represent the past two recessions).

Chart 9

**Share of male employment, seven major industries as a group, Oklahoma
1st quarter 2001 to 4th quarter 2009**



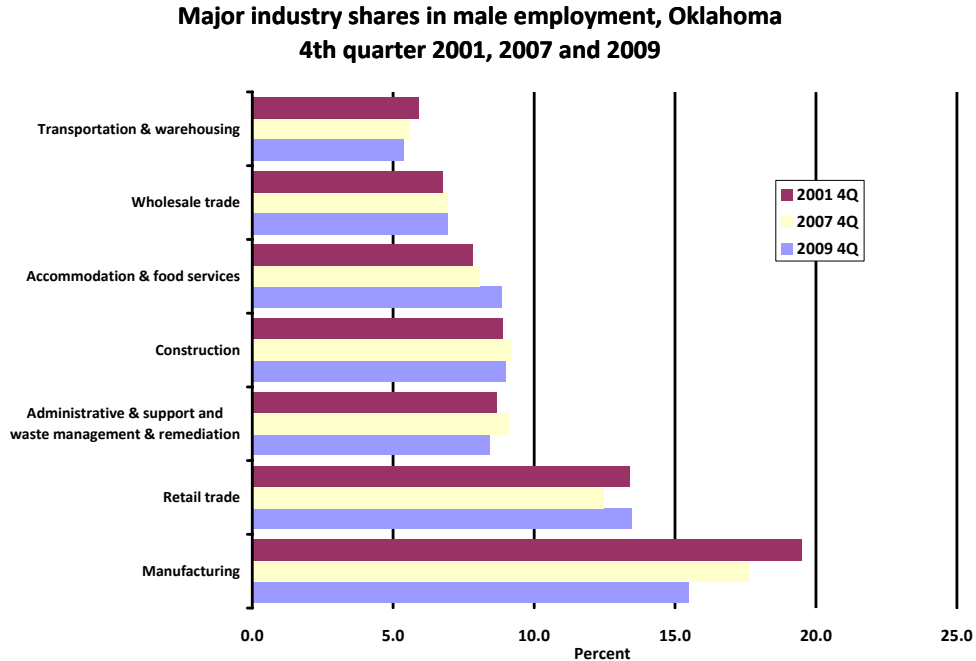
Source: Local Employment Dynamics (LED), Quarterly Workforce Indicators (QWI), U.S. Census Bureau, 2010.

Of these seven industries, manufacturing suffered the greatest loss in its share of male employment, shrinking 5.4 percent in the past nine years (not seasonally adjusted).

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Chart 10 shows the seven major industry shares in the male employment during three different time periods in Oklahoma (not seasonally adjusted). Obviously, manufacturing experienced a significantly negative growth in its male employment share from 4th quarter 2001 to 4th quarter 2009.

Chart 10



Source: Local Employment Dynamics (LED), Quarterly Workforce Indicators (QWI), U.S. Census Bureau, 2010.

In the past nine years in Oklahoma, four industries grew rapidly in their shares of male employment: health care and social assistance, mining, quarrying, and oil and gas extraction, finance and insurance, and professional, scientific, and technical services.

Chart 12



Source: Local Employment Dynamics (LED), Quarterly Workforce Indicators (QWI), U.S. Census Bureau, 2010.

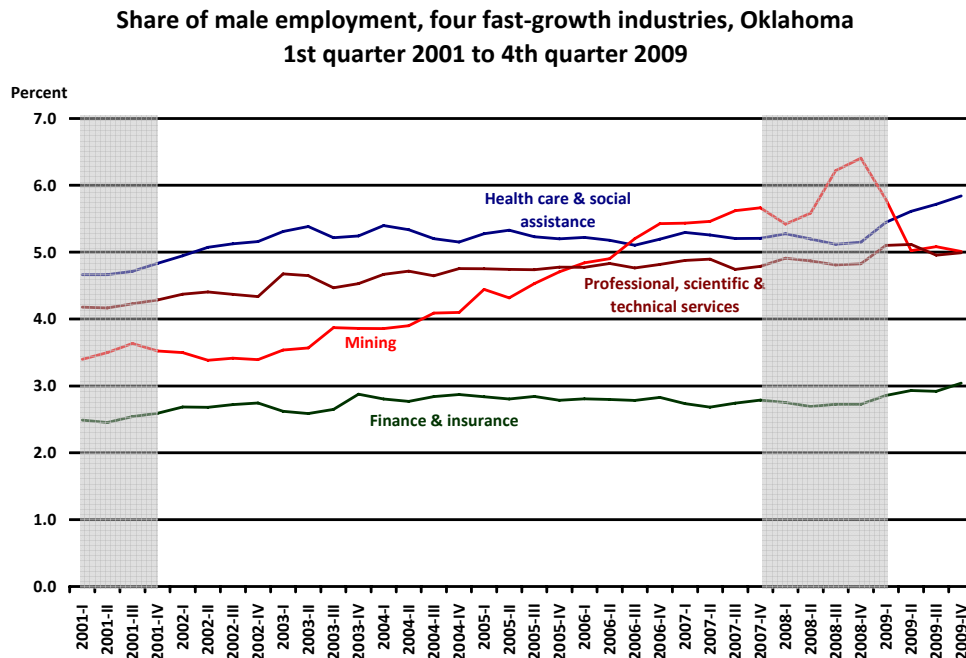
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As a group, these industries increased 4.2 percent in the male employment share, from 14.7 percent in 1st quarter 2001 to 18.9 percent in 4th quarter 2009 (not seasonally adjusted). See Chart 11, (on the previous page), for more details.

Of the four fast-growth industries in terms of the share in the male employment, the mining, quarrying, and oil and gas extraction industry saw the largest expansion in its share of male employment over the past nine years. Though affected by the recession, its share increased by 1.6 percent, from 3.4 percent in 1st quarter 2001 to 5.0 percent in 4th quarter 2009 (not seasonally adjusted).

The second fast-growth industry is health care and social assistance. Its share in male employment grew from 4.7 percent in 1st quarter 2001 to 5.8 percent in 4th quarter 2009, or by 1.1 percent. Chart 12 displays more details.

Chart 12



Source: Local Employment Dynamics (LED), Quarterly Workforce Indicators (QWI), U.S. Census Bureau, 2010.

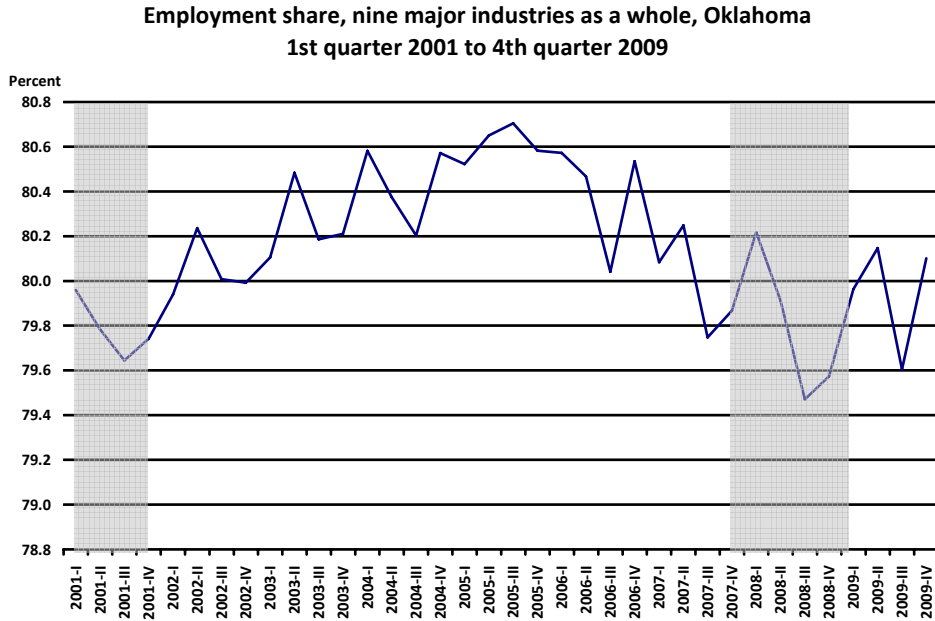
Change of Industry Employment Share in Oklahoma: 2001 to 2009

Oklahoma's total employment (non-seasonally adjusted) was mainly concentrated in nine industries from 2001 to 2009. The nine leading industries are accommodation and food services; administrative and support and waste management and remediation services; construction; finance and insurance; health care and social assistance; manufacturing; professional, scientific, and technical services; retail trade; and wholesale trade. On average, over the past nine years, 80 out of 100 workers employed in Oklahoma came from these industries: 14 from retail trade; 14 from health care and social assistance; 13 from manufacturing; 10 from accommodation and food services; 8 from administrative and support and waste management and remediation services; 6 from construction; 5 from wholesale trade; 5 from professional, scientific, and technical services; and 5 from finance and insurance.

The nine industries as a group maintained a fairly stable share (approximately 80 percent on average) of total employment over the past nine years. See Chart 13 below (the shaded areas represent the two recent recessions).

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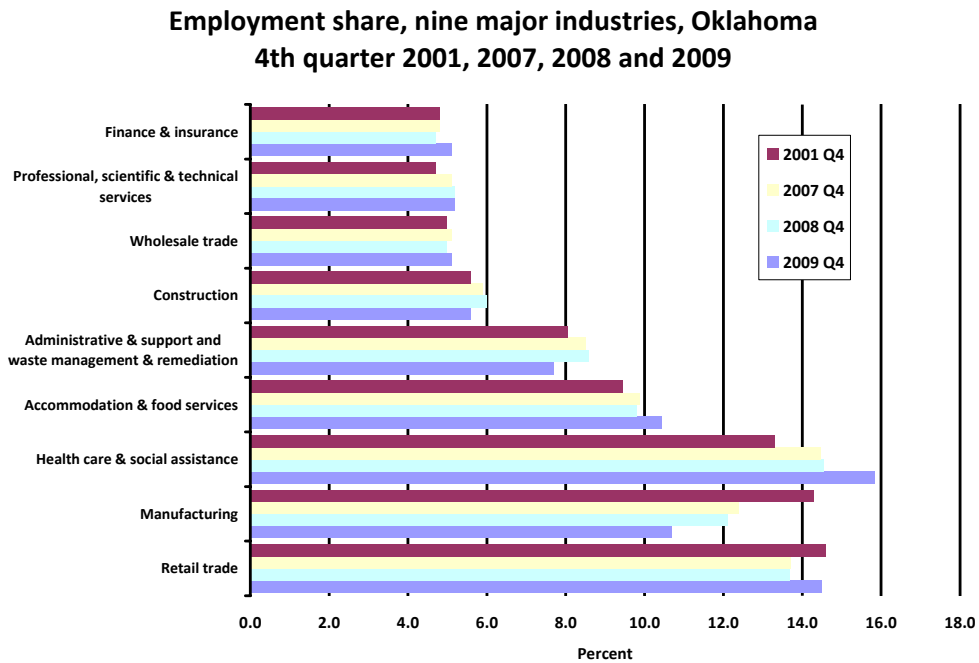
Chart 13



Source: Local Employment Dynamics (LED), Quarterly Workforce Indicators (QWI), U.S. Census Bureau, 2010.

Over the past nine years, two major changes occurred in the nine-industry group: a 3.0 percent expansion in health care employment coupled with an approximately 4.6 percent contraction in manufacturing employment. Accommodation and food services grew 1.2 percent while the other six industries experienced less than a 1 percent change in employment share from 2001 to 2009. Chart 14 (not seasonally adjusted) below, details employment in the nine major industries in Oklahoma during four different time periods.

Chart 14



Source: Local Employment Dynamics (LED), Quarterly Workforce Indicators (QWI), U.S. Census Bureau, 2010.

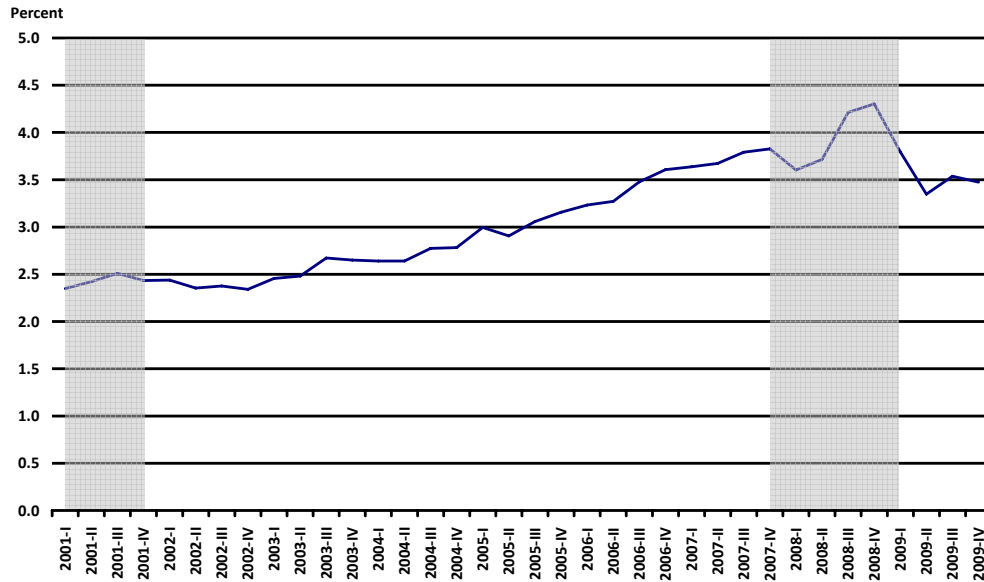
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Of the other 10 industries accounting for a small part of total employment in Oklahoma, mining, quarrying, oil and gas extraction performed the best from 2001 to 2009. Although affected by the latest recession, mining, quarrying, oil and gas extraction's share in total employment increased by 1.2 percentage point, from 2.3 percent in 1st quarter 2001 to 3.5 percent in 4th quarter 2009.

Chart 15 below shows the employment share of mining, quarrying, oil and gas extraction from 2001 to 2009 in Oklahoma (the shaded areas represent the two recent recessions).

Chart 15

**Employment share, mining, quarrying, and oil and gas extraction, Oklahoma
1st quarter 2001 to 4th quarter 2009**



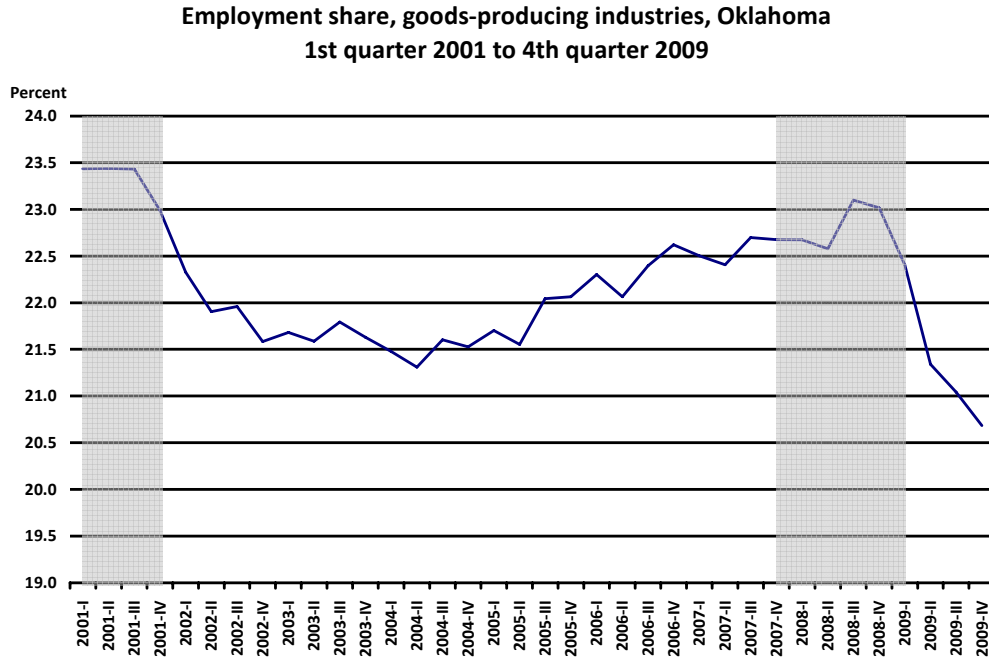
Source: Local Employment Dynamics (LED), Quarterly Workforce Indicators (QWI), U.S. Census Bureau, 2010.

There are a total of 20 industries classified by the North American Industry Classification System's (NAICS) two-digit industry code. Of the 20, four belong to goods-producing industries, and 16 to service-producing industries. The employment share by the four goods-producing sectors as a whole declined 2.7 percent from 1st quarter 2001 to 4th quarter 2009. By contrast, the employment share of 15 service-producing industries, (data for public administration in Oklahoma is not available), as a whole increased 2.7 percent for the same time period.

During the latest recession, total employment share of the goods-producing industries as a whole first rose and then fell, while the service-producing industries, as a whole, first fell and then rose in total employment share in Oklahoma. See Charts 16 and 17 (next page).

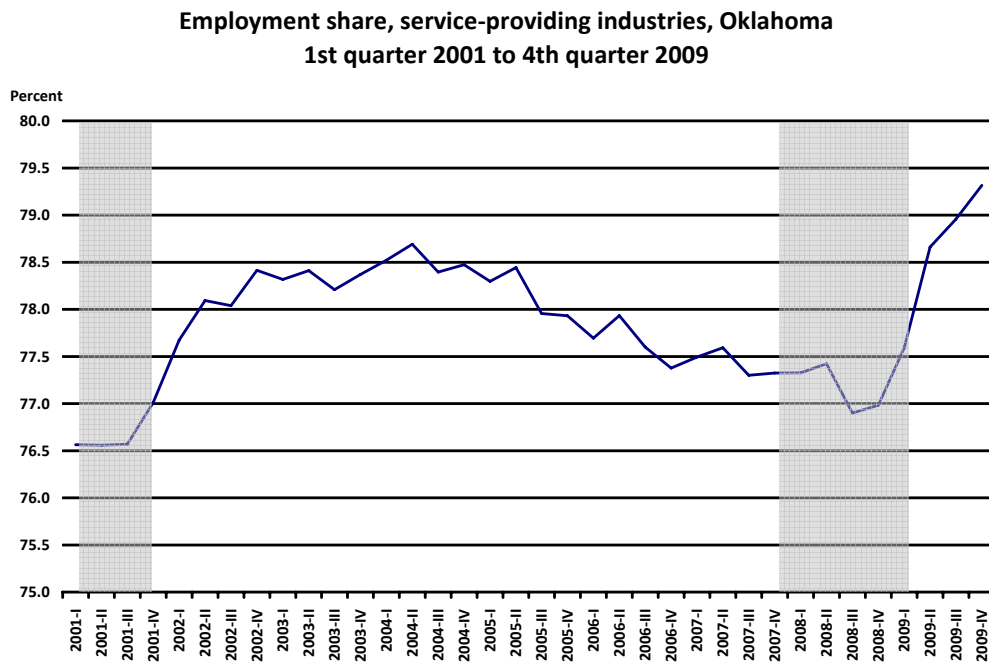
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Chart 16



Source: Local Employment Dynamics (LED), Quarterly Workforce Indicators (QWI), U.S. Census Bureau, 2010.

Chart 17



Source: Local Employment Dynamics (LED), Quarterly Workforce Indicators (QWI), U.S. Census Bureau, 2010.

Oklahoma Employment in the Past Two Recessions

Summary

Several major findings of this report are summarized below:

- Oklahoma lost nearly 100,000 jobs from 3rd quarter 2008 to 4th quarter 2010, reflecting the adverse effects of the latest recession on statewide employment.
- After 1st quarter 2009, Oklahoma experienced negative over-the-year changes in employment. By the last quarter of 2009, the state saw the largest employment drop in the past nine years (2001 to 2009), falling 7.5 percent compared to the same quarter of 2008.
- The latest recession appears to have affected male workers more negatively than female workers.
- Nine industries employed a larger number of workers from the beginning of the latest recession (4th quarter 2007) up to 4th quarter 2009. Five industries, (retail trade; finance and insurance; professional, scientific, and technical services; health care and social assistance; and accommodation and food services) increased employment share while four industries, (construction; manufacturing; wholesale trade; and administrative and support and waste management and remediation services) lost employment share. Manufacturing lost the largest employment share.
- Service-providing industries gained a larger portion of employment from 2001 to 2009. However, the service-providing industry group suffered greater job losses than the goods-producing industry group during the most recent recession.
- Over the past nine years, (2001 to 2009), six industries, (health care and social assistance; retail trade; accommodation and food services; manufacturing; administrative support and waste management and remediation services; and finance and insurance), contributed to the majority shares of female employment with some changes in composition. For male employment, there were significant changes in seven industries, (manufacturing; retail trade; administrative and support and waste management and remediation services; construction; accommodation and food services; wholesale trade; and transportation and warehousing), that predominately employ male laborers. Four industries grew faster in terms of the shares in the male employment.
- Nine industries as a group absorbed the majority employment in Oklahoma from 2001 to 2009. Among them, manufacturing declined approximately 4.6 percent while health care and social assistance expanded 3.0 percent in employment share.
- Ten industries as a group accounted for a small part of employment in Oklahoma from 2001 to 2009. Among them, mining, quarrying, oil and gas extraction grew the fastest in terms of employment share.
- During the latest recession, the employment share of the goods-producing industry group first rose and then fell, while the service-producing industry group first fell and then rose in total employment share.

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APPENDIX

- NAICS (North American Industry Classification System) classifies all economic activities into 20 sectors. The NAICS sectors and their 2-digit codes are listed in the table below.

NAICS code	Industry
11*	Agriculture, forestry, fishing and hunting
21*	Mining, quarrying, and oil and gas extraction
22	Utilities
23*	Construction
31-33*	Manufacturing
42	Wholesale trade
44-45	Retail trade
48-49	Transportation and warehousing
51	Information
52	Finance and insurance
53	Real estate and rental and leasing
54	Professional, scientific, and technical services
55	Management of companies and enterprises
56	Administrative and support and waste management and remediation services
61	Educational services
62	Health care and social assistance
71	Arts, entertainment, and recreation
72	Accommodation and food services
81	Other services (except public administration)
92**	Public administration

Source: North American Industry Classification System (NAICS), Office of Management and Budget, 2007.

*NAICS 11, 21, 23, and 31-33 are goods-producing industries, the rest are service-providing industries (including public administration).

** Data not available.

- The two recent recessions defined by the National Bureau of Economics Research (NBER) Business Cycle Dating committee are:
 - 2001 Recession: March 2001 to November 2001 (8 months)
 - 2007-09 Recession: December 2007 to June 2009 (18 months)
- All the data used, (including all the calculations based on these data), in this report are not seasonally adjusted.