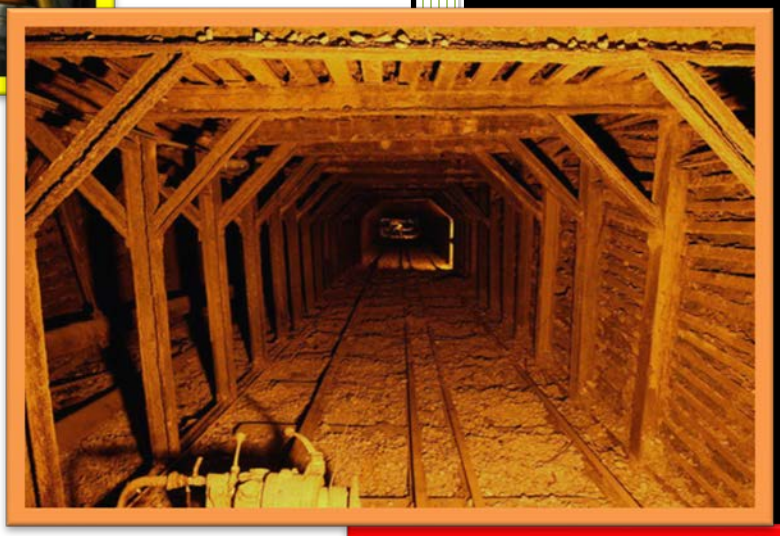
2019

Oklahoma Job Quarterly Earnings Percentile Changes

All Industries, Mining, Manufacturing and Health for Years 2008 to 2018



Oklahoma Employment Security Commission
Economic Research and Analysis Division

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Oklahoma Job Quarterly Earnings Percentile Changes:
All industry, Mining, Manufacturing and Health for Years 2008 to 2018
(An update of three previous 10-year reports)

I. Introduction

A time series analysis of earnings and earnings change is an important economic indicator of the relative health of Oklahoma's businesses, as well as our workforce well-being. While we have always been able to measure the change in average earnings by using administrative records, we have not viewed these changes in earnings across the income spectrum. To address this we have used our agency administrative earnings records to construct a 10-year history and recent year changes in earnings as measured by percentiles. In short, this analysis uses percentile ranking of the job quarterly earnings of individual jobs, from lowest to highest to report job earnings changes and to determine important earnings changes by income level.

The data set is by job not individual. Consequently, if a person works two part-time jobs then the two part-time jobs would each show up separately. In addition we excluded any job with earnings of less than $300 for the reference quarter. The data for second job quarter earnings for the years 2008 and 2018 as well as a number of years in between are included. The data set does not include federal jobs.

This report is an update of three previous year 2005 to 2015, 2006 to 2016 and 2007 to 2017 annual reports, and as such, provides new 10-year, 3-year and 1-year percentile earnings for the four NAICS industry sectors: NAICS 00 Total, All Industries, ('all industries'); NAICS 21 Mining, Quarrying, and Oil and Gas Extraction, ('mining'); NAICS 31-33 Manufacturing, ('manufacturing'); and NAICS 62 Health Care and Social Assistance, ('health'), comparing them with their two previous time series analysis earnings and earnings change findings and the findings of each category with the three others."

II. Industry Percentile Job Quarterly Earnings: 10-Year Changes - Years 2008 to 2018

Table 1 shows the job quarterly earnings and percentile change of an aggregate of all industries between the 2nd quarter 2008 and the 2nd quarter 2018.

Table 1. All Industry Percentage Change of Quarterly Job Earnings by Percentile, in 10-Year Interval: 2008 to 2018

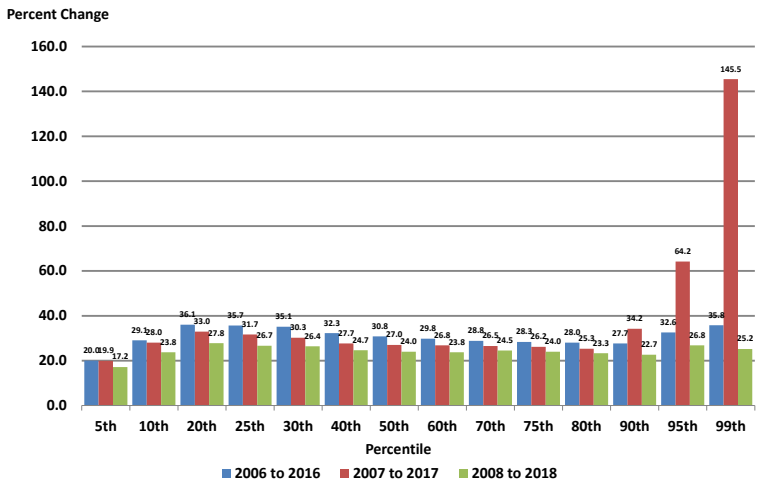
Percentile	2008	2018	Numeric Change	Percent Change
5th	$583	$683	$100	17.2
10th	$938	$1,161	$223	23.8
20th	$1,879	$2,402	$523	27.8
25th	$2,487	$3,150	$663	26.7
30th	$3,142	$3,971	$829	26.4
40th	$4,505	$5,617	$1,112	24.7
50th	$5,843	$7,244	$1,401	24.0
60th	$7,309	$9,046	$1,737	23.8
70th	$9,115	$11,350	$2,235	24.5
75th	$10,325	$12,800	$2,475	24.0
80th	$11,791	$14,538	$2,747	23.3
90th	$16,217	$19,894	$3,677	22.7
95th	$20,693	$26,249	$5,556	26.8
99th	$39,807	$49,838	$10,032	25.2
Total Jobs	**1,666,137**	**1,746,541**	**80,404**	**4.8**

Note[1]: The unit of analyis is a job and earnings are second quarter job totals, excluding Federal jobs.

Note[2]: Cases where earnings are less than $300 removed.

On next page 2, Chart 1a shows the all industries percentile earnings changes for the three 10-year intervals of 2006 to 2016, 2007 to 2017 and 2008 to 2018 in comparison.

Chart 1a. All Industry Job Quarterly Earnings Percentile Percent Change, Three 10-Year Interval Comparisons: 2006 to 2016, 2007 to 2017 and 2008 to 2018



In the 10-year interval of 2006 to 2016, all industries had the two larger size earnings percent change in the lower 20th and highest 99th percentiles, with 36.1 and 35.8 percent change, respectively. The 2007 to 2017 10-year interval showed the two percentiles with the largest increases of all, a 145.5 percent increase in the 99th and a 64.2 percent increase in the 95th percentile.[1] The recent 2008 to 2018 10-year interval had their two highest increase in the lower percentile 25th percentile and upper 95th percentile, with 27.8 and 26.8 percent change, respectively. The latter ten year interval showed the lower of the three in earnings change for all 14 percentiles, with each percentile being lower than their 2006 to 2016 and the 2007 to 2017 ten year interval counterparts.

Table 2. Mining Percentage Change of Quarterly Job Earnings by Percentile, in 10-Year Interval: 2008 to 2018

Percentile	2008	2018	Numeric Change	Percent Change
5th	$1,415	$1,890	$475	33.6
10th	$2,720	$3,854	$1,134	41.7
20th	$5,746	$7,905	$2,159	37.6
25th	$7,000	$9,609	$2,609	37.3
30th	$8,076	$11,023	$2,947	36.5
40th	$10,033	$13,644	$3,611	36.0
50th	$12,015	$16,124	$4,110	34.2
60th	$14,226	$18,632	$4,406	31.0
70th	$16,660	$21,902	$5,242	31.5
75th	$18,228	$24,035	$5,807	31.9
80th	$20,380	$26,577	$6,197	30.4
90th	$27,506	$35,411	$7,905	28.7
95th	$37,970	$47,889	$9,919	26.1
99th	$94,592	$96,016	$1,423	1.5
Total Jobs	**56,960**	**58,110**	**1,150**	**2.0**

Note[1]: The unit of analyis is a job and earnings are second quarter job totals, excluding Federal jobs.

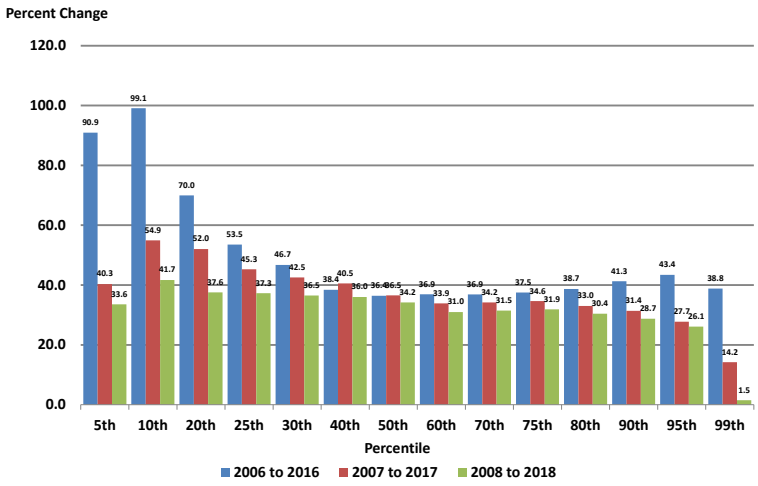
Note[2]: Cases where earnings are less than $300 removed.

Table 2 displays that for the 2008 to 2018 10-year interval the larger two size percentile percent earnings change occurred in the 10th and the 20th percentiles, with the highest earnings percent change of 41.7 percent in the former and the second highest of 37.6 percent in the latter. The third highest earnings percent change of 37.3 percent occurred in the 25th percentile.

[1] The difference is likely an arithmetic artifact, due to the "lower" $9,745 starting 2007 year earnings for the former vs the $33,000 (not shown) starting 2005 year earnings for the latter, with flat earnings gains to $48,466 in 2017 and to $48,176 in 2015.

The 2008 to 2018 mining 10-year interval is compared to the two 10-year intervals of 2006 to 2016 and 2007 to 2017 in Chart 2a.

Chart 2a. Mining Job Quarterly Earnings Percentile Percent Change, Three 10-Year Interval Comparisons: 2006 to 2016, 2007 to 2017 and 2008 to 2018



The 10-year intervals of 2006 to 2016 years, 2007 to 2017 and 2008 to 2018 all had their larger size mining earnings percent change at the lower end of the percentile range. The 2006 to 2016 10-year interval had its highest mining earnings change of 99.1 percent in the 10th percentile, the second highest of 90.9 percent in the 5th percentile and their third highest mining earnings change of 70.0 percent in the 20 percentile. The 2007 to 2017 10-year interval had its highest mining earnings change of 54.9 percent in the 10th percentile, the second highest of 52.0 percent in the 20th percentile and their third highest mining earnings change of 45.3 percent in the 25 percentile. The 2008 to 2018 10-year interval highest three ranking earnings percent change in the same three percentiles; of 41.7, 37.7 and 37.3 percent respectively.

Table 3, below shows the percentile earnings and earnings change for manufacturing, for the 10-year interval of 2008 to 2018

Table 3. Manufacturing Percentage Change of Quarterly Job Earnings by Percentile, in 10-Year Interval: 2008 to 2018

Percentile	2008	2018	Numeric Change	Percent Change
5th	$1,248	$1,610	$362	29.0
10th	$2,542	$3,351	$809	31.8
20th	$4,695	$6,179	$1,484	31.6
25th	$5,363	$7,083	$1,720	32.1
30th	$5,976	$7,901	$1,925	32.2
40th	$7,139	$9,400	$2,261	31.7
50th	$8,262	$10,913	$2,651	32.1
60th	$9,543	$12,607	$3,064	32.1
70th	$11,227	$14,733	$3,506	31.2
75th	$12,301	$16,045	$3,744	30.4
80th	$13,571	$17,555	$3,984	29.4
90th	$17,662	$22,939	$5,277	29.9
95th	$22,312	$29,340	$7,028	31.5
99th	$39,389	$48,717	$9,329	23.7
Total Jobs	**166,886**	**143,583**	**-23,303**	**-14.0**

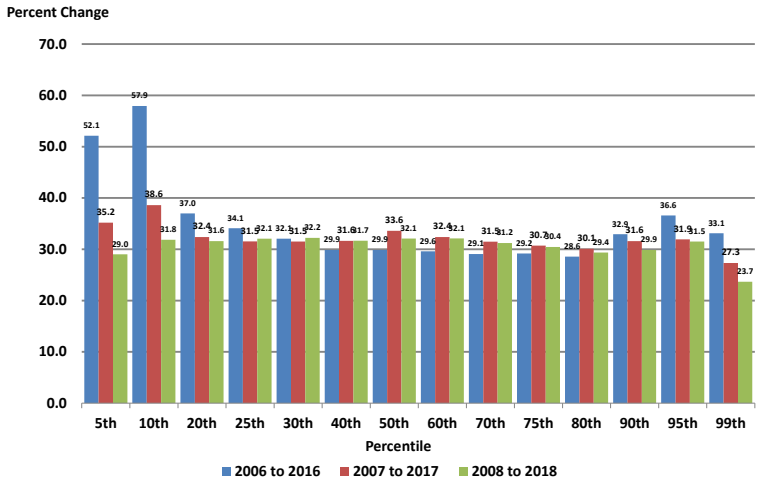
Note[1]: The unit of analyis is a job and earnings are second quarter job totals, excluding Federal jobs.

Note[2]: Cases where earnings are less than $300 removed.

Table 3 displays that most manufacturing percentiles percent change in this interval was of a larger size than the same percentile in all industry shown in Table 1 on page 1, but most percentiles changed less

than those of the same percentile in mining in Table 2 on page 2. However of the three industry categories of all industries, mining and manufacturing, mining generally has the largest earnings and the larger earnings amount change of each industry when comparing the same percentile. Below, Chart 3a shows manufacturing 2008 to 2018 percentile changes in comparison to 2006 to 2016 and 2007 to 2017.

Chart 3a. Manufacturing Job Quarterly Earnings Percentile Percent Change, Three 10-Year Interval Comparisons: 2006 to 2016, 2007 to 2017 and 2008 to 2018



The 10-year interval of 2006 to 2016 had the first and second largest earnings change in the lower two 10th and 5th percentiles. The 2007 to 2017 10-year interval had its largest two earnings change in the same two percentiles. The 2008 to 2018 10-year interval had the highest earnings change of 32.2 percent in the 30th percentile, with the 50th and 60th percentiles tied for second, each with 32.1 percent earnings change. Of the three 10-year intervals, 2006 to 2016 most often had the percentile with the higher change, with seven percentiles, four in the lower and three in the higher range with this distinction.

Table 4, below shows the percentile earnings and earnings change for health, for the 10-year interval of 2008 to 2018.

Table 4. Health Percentage Change of Quarterly Job Earnings by Percentile, in 10-Year Interval: 2008 to 2018

Percentile	2008	2018	Numeric Change	Percent Change
5th	$686	$821	$135	19.7
10th	$1,158	$1,450	$292	25.2
20th	$2,327	$3,013	$686	29.5
25th	$2,996	$3,886	$890	29.7
30th	$3,610	$4,693	$1,083	30.0
40th	$4,715	$6,111	$1,396	29.6
50th	$5,785	$7,432	$1,647	28.5
60th	$7,042	$9,025	$1,983	28.2
70th	$8,830	$11,470	$2,640	29.9
75th	$10,089	$13,112	$3,023	30.0
80th	$11,632	$15,031	$3,399	29.2
90th	$16,072	$20,738	$4,666	29.0
95th	$21,357	$29,085	$7,728	36.2
99th	$65,681	$86,581	$20,900	31.8
Total Jobs	**176,444**	**187,521**	**11,077**	**6.3**

Note[1]: The unit of analysis is a job and earnings are second quarter job totals, excluding Federal jobs.

Note[2]: Cases where earnings are less than $300 removed.

Table 4 reveals that in the majority of percentiles the health 10-year earning change was of a larger size

than the same percentile in all industry shown in Table 1 on page 1, smaller than manufacturing as shown in Table 3 on the previous page, and in most cases less than those of the same percentile in mining, as show in Table 2 on page 2. A comparison of the median 50th percentile earnings in Tables 1 though Table 4 determines the earnings rank by descending order for 2008 to be mining, manufacturing, all industries and health. However by 2018 the median 50th percentile descending order rank of health was third. Chart 4a, below, compares health's change in the 2006 to 2016, 2007 to 2017 and 2008 to 2018 intervals.

Chart 4a. Health Job Quarterly Earnings Percentile Percent Change, Three 10-Year Interval Comparisons: 2006 to 2016, 2007 to 2017 and 2008 to 2018

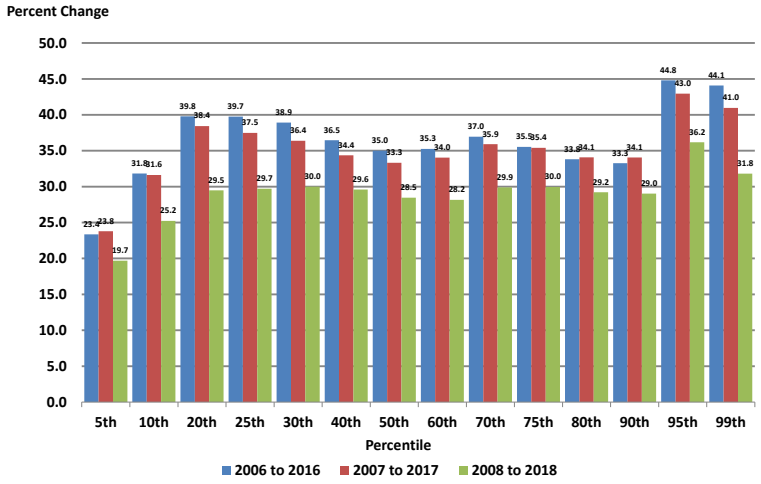


Chart 4a for the health industry illustrates different patterns than all industries, mining and manufacturing on the previous four pages. The chart shows health had two areas of higher earnings change for the three 10-year intervals. All three intervals had the first and second highest earnings change percentiles in either the 95th and 99th percentile. However, the three 10-year intervals had a second range of higher percentiles in the 20th through the 30 percentiles in the 2006 to 2016 and 2007 to 2017 intervals and in the 25th to the 40th percentile in the most recent 2008 to 2018 10-year interval. Comparing the median 50th percentile earnings change determines that earnings change decreases with ages of the time intervals.

III. Industry Percentile Job Quarterly Earnings: 3-Year Changes - Years 2008 to 2017

Table 5 shows the 3-year job quarterly earnings and earnings change by percentile of an aggregate of all industries between the 2nd quarter 2009 and the 2nd quarter 2018.

Table 5. All Industry Percentage Change of Quarterly Job Earnings by Percentile, in 3-Year Intervals: 2009 to 2018

Percentile	2009	2012	2015	2018	2009-2012 % Change	2012-15 % Change	2015-18 % Change
5th	$631	$650	$656	$683	3.0	0.9	4.1
10th	$1,038	$1,086	$1,105	$1,161	4.6	1.7	5.1
20th	$2,088	$2,202	$2,262	$2,402	5.5	2.7	6.2
25th	$2,723	$2,873	$2,970	$3,150	5.5	3.4	6.1
30th	$3,388	$3,558	$3,708	$3,971	5.0	4.2	7.1
40th	$4,697	$4,947	$5,212	$5,617	5.3	5.4	7.8
50th	$5,990	$6,365	$6,750	$7,244	6.3	6.0	7.3
60th	$7,415	$7,988	$8,450	$9,046	7.7	5.8	7.1
70th	$9,179	$10,006	$10,554	$11,350	9.0	5.5	7.5
75th	$10,361	$11,316	$11,947	$12,800	9.2	5.6	7.1
80th	$11,812	$12,936	$13,608	$14,538	9.5	5.2	6.8
90th	$16,267	$17,685	$18,698	$19,894	8.7	5.7	6.4
95th	$20,790	$22,877	$24,641	$26,249	10.0	7.7	6.5
99th	$39,682	$44,495	$48,176	$49,838	12.1	8.3	3.4
Total Jobs	**1,587,094**	**1,673,232**	**1,730,040**	**1,746,541**	**5.4**	**3.4**	**1.0**

Note[1]: The unit of analyis is a job and earnings are second quarter job totals, excluding Federal jobs.

Note[2]: Cases where earnings are less than $300 removed.

As shown on the previous page in Table 5, the first 3-year interval of 2009 to 2012 for all industries had the larger three size percentile earnings percent increases of increasing rank in the 80th, 95th and 99th percentiles. The second 3-year interval of 2012 to 2015 had the three larger size earnings percent changes in increasing rank in the 50th, 95th and 99th percentiles. The third 3-year interval of 2015 to 2018 tied for third rank in the 30th, 60th and 75th percentiles of 7.1 percent, had a second largest 7.5 percent in the 70th and largest 7.8 percent earnings percent change in the 40th percentiles. Chart 5a illustrates these changes.

Chart 5a All Industry Percentage Change of Quarterly Job Earnings by Percentile, in 3-Year Intervals: 2009 to 2018

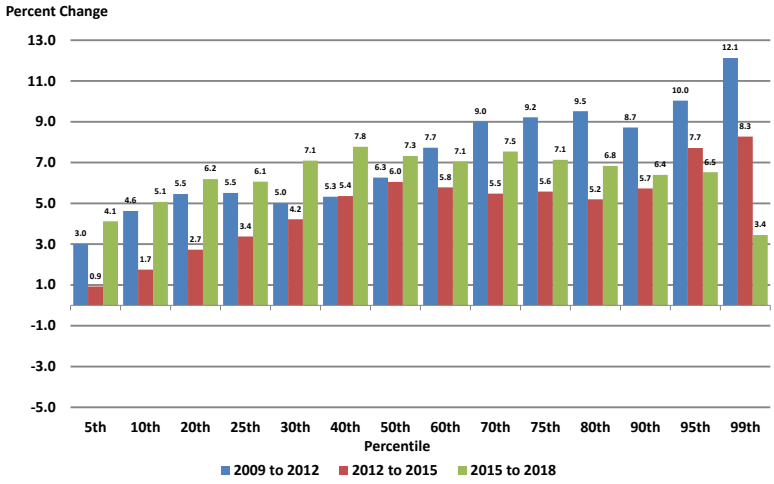


Chart 5a shows that different regions in the range of percentiles have the larger size earnings percent change increases for the different 3-year intervals. The 2009 to 2012 interval has the larger size earnings change in its 75th percentile and higher; the 2012 to 2015 interval has the larger size increases in its upper two 95th and 99th percentiles and also in its middle 50th, 60th and 75th percentiles; while the 2015 to 2018 3-year interval has the largest earnings percent increases in the lower 30th through the upper 75th percentiles. Comparing the earning change 50th percentile earnings percent changes for the three 3-year intervals determines that the 2015 to 2018 had the largest earnings change. Below, Table 6 shows the same 3-year interval earnings and earnings change for mining.

Table 6. Mining Percentage Change of Quarterly Job Earnings by Percentile, in 3-Year Intervals: 2009 to 2018

Percentile	2009	2012	2015	2018	2009-2012 % Change	2012-15 % Change	2015-18 % Change
5th	$1,660	$1,691	$1,794	$1,890	1.9	6.1	5.4
10th	$3,170	$3,244	$3,688	$3,854	2.3	13.7	4.5
20th	$6,150	$6,261	$7,409	$7,905	1.8	18.3	6.7
25th	$7,235	$7,543	$8,746	$9,609	4.3	15.9	9.9
30th	$8,132	$8,677	$9,900	$11,023	6.7	14.1	11.3
40th	$9,821	$10,718	$12,200	$13,644	9.1	13.8	11.8
50th	$11,686	$12,749	$14,510	$16,124	9.1	13.8	11.1
60th	$13,845	$15,000	$17,160	$18,632	8.3	14.4	8.6
70th	$16,606	$17,837	$20,325	$21,902	7.4	13.9	7.8
75th	$18,364	$19,581	$22,414	$24,035	6.6	14.5	7.2
80th	$20,763	$21,797	$25,007	$26,577	5.0	14.7	6.3
90th	$28,790	$29,584	$34,079	$35,411	2.8	15.2	3.9
95th	$39,900	$40,279	$47,060	$47,889	0.9	16.8	1.8
99th	$83,509	$72,731	$91,840	$96,016	-12.9	26.3	4.5
Total Jobs	**45,957**	**67,480**	**59,205**	**58,110**	**46.8**	**-12.3**	**-1.8**

Note[1]: The unit of analyis is a job and earnings are second quarter job totals, excluding Federal jobs.

Note[2]: Cases where earnings are less than $300 removed.

Comparing the mining 50th percentile earnings changes in Table 6 with those for all industries in Table 5,

reveals that the largest earnings changes for mining occurred in the 2012 to 2015, while for all industries the largest earnings changes was in the 3-year interval of 2015 to 2018. Below, Chart 6a illustrates these 3-year earnings changes for mining.

Chart 6a. Mining Percentage Change of Quarterly Job Earnings by Percentile, 3-Year Intervals: 2009 to 2018

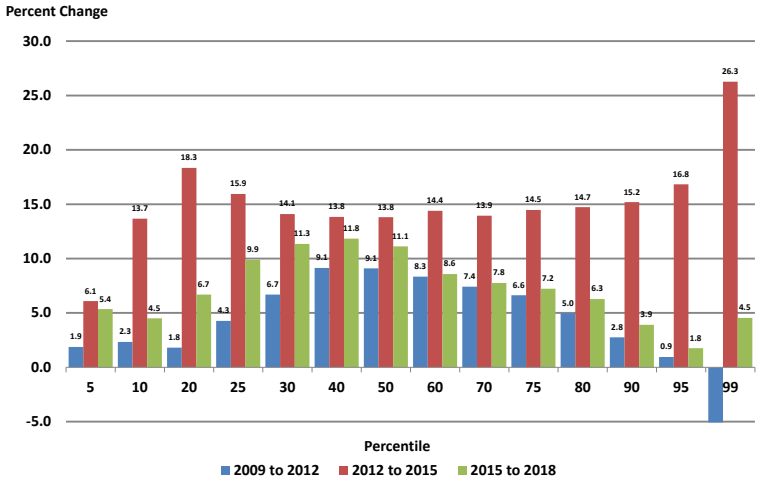


Chart 6a reveals that, as in all industries, in mining the different 3-year intervals have a different section of the percentile range with the higher earnings change. The 2009 to 2012 3-year interval has the higher five earnings percent change in the 30th percentile to 70th percentiles with the 99th percentile showing a sharp decline in earnings. The 2012 to 2015 has the five larger size earnings percent change in two areas of the percentile range: the 20th and 25th lower percentiles and the higher 90th through the 99th percentiles. The 2015 to 2018 3-year interval has the largest five earnings percent change in the lower 25th and mid-60th percentiles. Below, Table 7 displays the 3-year earnings and earnings change for manufacturing.

Table 7. Manufacturing Percentage Change of Quarterly Job Earnings by Percentile, in 3-Year Intervals: 2009 to 2018

Percentile	2009	2012	2015	2018	2009-2012 % Change	2012-15 % Change	2015-18 % Change
5th	$1,570	$1,458	$1,600	$1,610	-7.1	9.7	0.6
10th	$3,000	$2,983	$3,227	$3,351	-0.6	8.2	3.9
20th	$4,848	$5,324	$5,644	$6,179	9.8	6.0	9.5
25th	$5,446	$6,053	$6,410	$7,083	11.1	5.9	10.5
30th	$5,989	$6,719	$7,109	$7,901	12.2	5.8	11.1
40th	$7,039	$8,037	$8,394	$9,400	14.2	4.4	12.0
50th	$8,188	$9,426	$9,835	$10,913	15.1	4.3	11.0
60th	$9,458	$10,959	$11,442	$12,607	15.9	4.4	10.2
70th	$11,177	$12,940	$13,579	$14,733	15.8	4.9	8.5
75th	$12,229	$14,135	$14,915	$16,045	15.6	5.5	7.6
80th	$13,500	$15,494	$16,444	$17,555	14.8	6.1	6.8
90th	$17,707	$19,868	$21,399	$22,939	12.2	7.7	7.2
95th	$22,615	$24,879	$27,200	$29,340	10.0	9.3	7.9
99th	$38,838	$44,217	$46,730	$48,717	13.8	5.7	4.3
Total Jobs	**141,763**	**149,642**	**151,737**	**143,583**	**5.6**	**1.4**	**-5.4**

Note[1]: The unit of analyis is a job and earnings are second quarter job totals, excluding Federal jobs.

Note[2]: Cases where earnings are less than $300 removed.

Comparing the median 50th percentile of the 3-year earnings income change of manufacturing in Table 7 on this page with that of all industry in Table 5 on page 5 and the 50th percentiles of mining in Table 6 on page 6 reveals that manufacturing had the largest earnings change in in the 2009 to 2012 interval, all industry's largest change was in years 2015 to 2018, while mining had the largest 3-year earnings change in the 2012 to 2015 interval. Chart 7 (next page) shows manufacturing's 3-year earnings changes.

Chart 7a. Manufacturing Percentage Change of Quarterly Job Earnings by Percentile, in 3-Year Intervals: 2009 to 2018

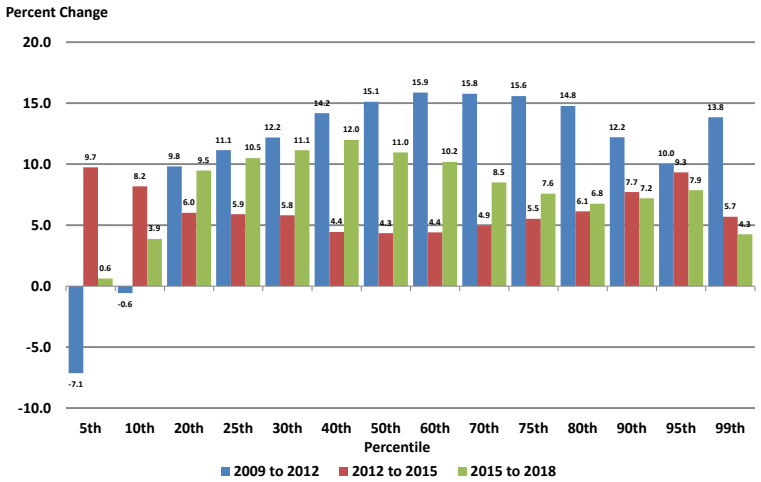


Chart 7a for manufacturing also displays that each of the three 3-year intervals has different sections of the percentile ranges with the larger size earnings change. For the 2009 to 2012 3-year interval the mid-50th through upper 80th percentiles of manufacturing had the larger percent change, but with the 5th and 10th percentiles showing decreases in earnings. The 2012 to 2015 3-year interval had their larger increases in earnings in the lower 5th and 10th percentiles and the upper range 80th through the 95th percentiles. The 2015 to 2018 3-year interval had the greater manufacturing earnings size change, in the mid-lower 25th percentile to the 60th percentile. Comparing the median 50th percentile earnings change for the three 3-year interval determined that the 2009 to 2012 interval had the largest change of 15.1 percent, while the 2012 to 2015 interval had the lowest 50th percentile earnings percent change of 4.3 percent.

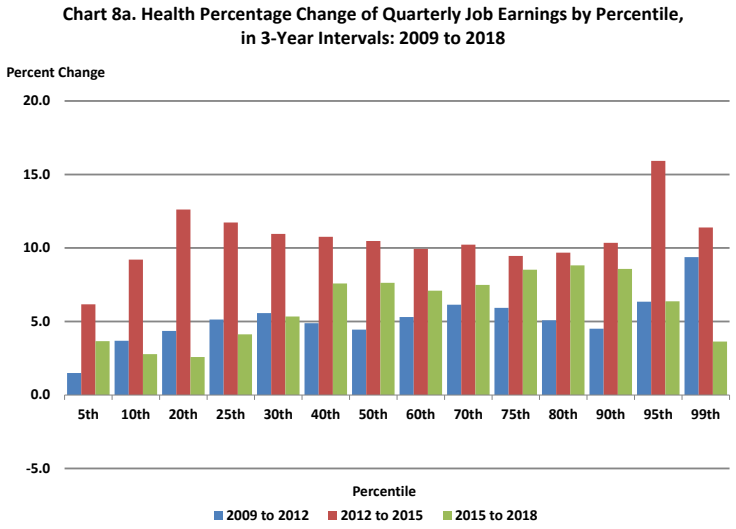
Table 8. Health Percentage Change of Quarterly Job Earnings by Percentile, in 3-Year Intervals: 2009 to 2018

Percentile	2009	2012	2015	2018	2009-2012 % Change	2012-15 % Change	2015-18 % Change
5th	$735	$746	$792	$821	1.5	6.2	3.7
10th	$1,246	$1,292	$1,411	$1,450	3.7	9.2	2.8
20th	$2,499	$2,608	$2,937	$3,013	4.4	12.6	2.6
25th	$3,177	$3,340	$3,732	$3,886	5.1	11.7	4.1
30th	$3,803	$4,015	$4,455	$4,693	5.6	11.0	5.3
40th	$4,889	$5,128	$5,680	$6,111	4.9	10.8	7.6
50th	$5,984	$6,250	$6,905	$7,432	4.4	10.5	7.6
60th	$7,279	$7,665	$8,427	$9,025	5.3	9.9	7.1
70th	$9,121	$9,681	$10,671	$11,470	6.1	10.2	7.5
75th	$10,420	$11,038	$12,082	$13,112	5.9	9.5	8.5
80th	$11,985	$12,594	$13,813	$15,031	5.1	9.7	8.8
90th	$16,560	$17,308	$19,100	$20,738	4.5	10.4	8.6
95th	$22,177	$23,585	$27,342	$29,085	6.3	15.9	6.4
99th	$68,566	$75,000	$83,545	$86,581	9.4	11.4	3.6
Total Jobs	**179,062**	**187,664**	**182,923**	**187,521**	**4.8**	**-2.5**	**2.5**

Note[1]: The unit of analyis is a job and earnings are second quarter job totals, excluding Federal jobs.

Note[2]: Cases where earnings are less than $300 removed.

Table 8 shows that in health the 3-year interval of 2012 to 2015 experienced the highest earning change in all percentiles, with a median 50th percentile change of 10.5 percent, followed by the 2015 to 2018 3-year intervals change of 7.6 percent and the 2009 to 2012 3-year interval's 50th percentile earnings change of 4.4 percent. On the next page, Chart 8a illustrates these 3-year earnings changes for health.



In the three 3-year intervals health experienced the five percentiles with the largest change in different parts of the fourteen percentile ranges. In the 2009 to 2012 3-year interval this larger change was in the upper 99th and 95th percentiles, the mid-upper 70th and 75th percentiles and in the lower 30th percentiles. In the 2012 to 2015 3-year interval the largest change was in the 95th and 99th percentile followed by the lower 25th to mid-40th percentiles. The 2015 to 2018 interval experienced the larger changes in the upper 75th to 90th percentile range and a tie in the two middle 40th and 50th percentiles, each with 7.6 percent.

When comparing health earnings change with the other three prior discussed industries, Table 8 on page 8 shows that health had the larger size percentile earnings change in the 2012 to 2015 3-year interval, the same 3-year interval that Table 6 on page 6 shows that mining had its largest earnings change. As noted previously, Table 5 on page 5 shows that all industry experienced its largest change in the 2015 to 2018. Table 7 on page 7 displays that manufacturing had its largest change in the 2009 to 2012 3-year interval. Comparing the median 50th percentile earnings changes of four industry categories in the most recent 3-year interval of 2015 to 2018, identifies that mining experience the larger earnings percent change.

IV. Industry Percentile Job Quarterly Earnings: 1-Year Changes - Years 2015 to 2018

Table 9 shows three 1-year job quarterly earnings and percentile change of an aggregate of all industries between the 2nd quarter 2015 and the 2nd quarter 2018.

Table 9. All Industry Percentage Change of Quarterly Job Earnings by Percentile, in 1-Year Intervals: 2009 to 2018

Percentile	2015	2016	2017	2018	2015-16 % Change	2016-17 % Change	2017-18 % Change
5th	$656	$671	$680	$683	2.3	1.3	0.4
10th	$1,105	$1,140	$1,155	$1,161	3.2	1.3	0.5
20th	$2,262	$2,347	$2,372	$2,402	3.8	1.1	1.3
25th	$2,970	$3,068	$3,090	$3,150	3.3	0.7	1.9
30th	$3,708	$3,861	$3,888	$3,971	4.1	0.7	2.1
40th	$5,212	$5,408	$5,461	$5,617	3.8	1.0	2.9
50th	$6,750	$6,948	$7,042	$7,244	2.9	1.4	2.9
60th	$8,450	$8,639	$8,816	$9,046	2.2	2.0	2.6
70th	$10,554	$10,770	$11,026	$11,350	2.0	2.4	2.9
75th	$11,947	$12,127	$12,434	$12,800	1.5	2.5	2.9
80th	$13,608	$13,804	$14,107	$14,538	1.4	2.2	3.1
90th	$18,698	$18,884	$19,381	$19,894	1.0	2.6	2.6
95th	$24,641	$24,863	$25,452	$26,249	0.9	2.4	3.1
99th	$48,176	$48,000	$48,466	$49,838	-0.4	1.0	2.8
Total Jobs	**1,730,040**	**1,701,877**	**1,716,953**	**1,746,541**	**-1.6**	**0.9**	**1.7**

Note[1]: The unit of analyis is a job and earnings are second quarter job totals, excluding Federal jobs.

Note[2]: Cases where earnings are less than $300 removed.

On the previous page, Table 9 displays the all industry 1-year earnings change that has occurred in the last three years. Of the three 1-year intervals shown, the 2017 to 2018 interval and the 2015 to 2016 interval tied for the largest earnings change, with the median 50th percentile showing a 2.9 percent earnings change each. However the latter interval shows a decrease in earnings in the 99th percentile of 0.4 percent. Below Chart 9a illustrates these percentile earnings changes.

Chart 9a. All Industry Percentage Change of Quarterly Job Earnings by Percentile, in 1-Year Intervals: 2015 to 2018

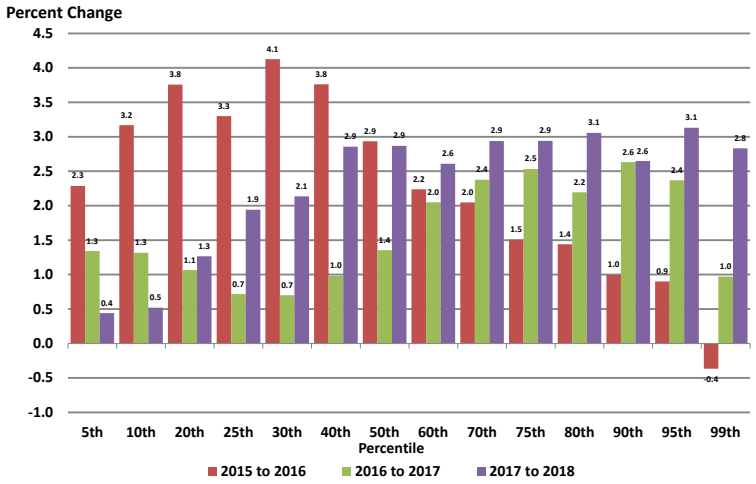


Chart 9a displays that in the three 1-year intervals, all industry experienced the five percentiles with the largest change in different parts of the fourteen percentile range. In the 2015 to 2016 1-year interval this larger change was in the lower 10th through mid-40th percentiles. In the 2016 to 2017 1-year interval the largest change was in the upper end 60th through the 95th percentiles. The 2017 to 2018 interval had 6 percentiles of the 14 with the five largest change. These were in the mid-lower 40th to upper 95th percentile range. In the latter interval, the 80th and 95th percentile tied for the largest change of 3.1 percent each and the 40th, 50th, 70th, and 75th percentiles' each had 2.9 percent earnings change.

Table 10. Mining Percentage Change of Quarterly Job Earnings by Percentile, in 1-Year Intervals: 2015 to 2018

Percentile	2015	2016	2017	2018	2015-16 % Change	2016-17 % Change	2017-18 % Change
5th	$1,794	$2,101	$1,837	$1,890	17.1	-12.6	2.9
10th	$3,688	$4,182	$3,749	$3,854	13.4	-10.3	2.8
20th	$7,409	$7,832	$7,800	$7,905	5.7	-0.4	1.3
25th	$8,746	$9,100	$9,400	$9,609	4.1	3.3	2.2
30th	$9,900	$10,268	$10,793	$11,023	3.7	5.1	2.1
40th	$12,200	$12,391	$13,350	$13,644	1.6	7.7	2.2
50th	$14,510	$14,759	$15,680	$16,124	1.7	6.2	2.8
60th	$17,160	$17,307	$18,216	$18,632	0.9	5.2	2.3
70th	$20,325	$20,363	$21,398	$21,902	0.2	5.1	2.4
75th	$22,414	$22,396	$23,488	$24,035	-0.1	4.9	2.3
80th	$25,007	$24,988	$25,938	$26,577	-0.1	3.8	2.5
90th	$34,079	$34,626	$34,386	$35,411	1.6	-0.7	3.0
95th	$47,060	$47,500	$45,567	$47,889	0.9	-4.1	5.1
99th	$91,840	$96,878	$88,590	$96,016	5.5	-8.6	8.4
Total Jobs	**59,205**	**47,597**	**52,292**	**58,110**	**-19.6**	**9.9**	**11.1**

Note[1]: The unit of analyis is a job and earnings are second quarter job totals, excluding Federal jobs.

Note[2]: Cases where earnings are less than $300 removed.

Table 10 shows that in mining the 1-year interval of 2016 to 2017 experienced the highest earning change of the three 1-year intervals, with a median 50th percentile change of 6.2 percent, followed by the 2017 to

2018 1-year interval's change of 2.8 percent and the 2015 to 2016 1-year interval's median 50th percentile earnings change of 1.7 percent. Below, Chart 10a illustrates these 1-year earnings changes for mining.

Chart 10a. Mining Percentage Change of Quarterly Job Earnings by Percentile, in 1-Year Intervals: 2015 to 2018

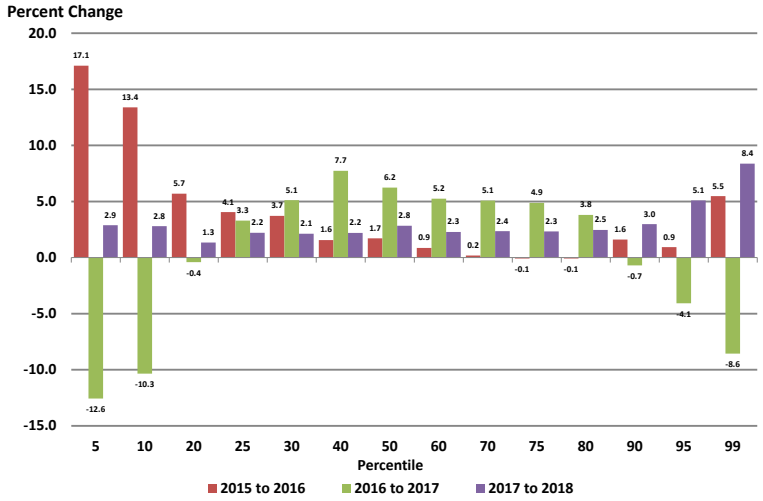


Chart 10a for mining displays that each of the three 1-year intervals had different sections of the percentile ranges with the five larger size percentile earnings change. For the 2015 to 2016 1-year interval the lower 5th through the 25th percentiles and the upper 99th percentile had the larger change. The 2016 to 2017 1-year interval, experienced its larger percent change in the lower 30th through the mid-upper 70th percentiles. Interestingly, even though this interval by 50th median comparisons had the largest of the three 1-year earnings percent change, the two 5th and 10th percentiles at the lower end and the three 90th through the 99th percentiles at the upper end experienced earnings decreases. Finally, the 2017 to 2018 1-year interval had the larger 5 percentiles with mining earnings percent change in the two lowest 5th and 10th percentiles and the three upper 90th percentile to the 99th percentile.

Table 11. Manufacturing Percentage Change of Quarterly Job Earnings by Percentile, in 1-Year Intervals: 2015 to 2018

Percentile	2015	2016	2017	2018	2015-16 % Change	2016-17 % Change	2017-18 % Change
5th	$1,600	$1,704	$1,606	$1,610	6.5	-5.8	0.2
10th	$3,227	$3,502	$3,267	$3,351	8.5	-6.7	2.6
20th	$5,644	$5,843	$5,935	$6,179	3.5	1.6	4.1
25th	$6,410	$6,607	$6,776	$7,083	3.1	2.6	4.5
30th	$7,109	$7,271	$7,543	$7,901	2.3	3.7	4.7
40th	$8,394	$8,558	$8,998	$9,400	2.0	5.1	4.5
50th	$9,835	$9,984	$10,518	$10,913	1.5	5.3	3.8
60th	$11,442	$11,663	$12,167	$12,607	1.9	4.3	3.6
70th	$13,579	$13,692	$14,244	$14,733	0.8	4.0	3.4
75th	$14,915	$15,000	$15,509	$16,045	0.6	3.4	3.5
80th	$16,444	$16,508	$16,963	$17,555	0.4	2.8	3.5
90th	$21,399	$21,800	$22,106	$22,939	1.9	1.4	3.8
95th	$27,200	$27,853	$28,161	$29,340	2.4	1.1	4.2
99th	$46,730	$46,307	$46,180	$48,717	-0.9	-0.3	5.5
Total Jobs	**151,737**	**139,624**	**140,377**	**143,583**	**-8.0**	**0.5**	**2.3**

Note[1]: The unit of analyis is a job and earnings are second quarter job totals, excluding Federal jobs.

Note[2]: Cases where earnings are less than $300 removed.

Examining the median 50th percentiles in Table 11 reveals that manufacturing also had its largest earnings changes in the 1-year interval of 2016 to 2017, as did mining. However both manufacturing and mining had some percentiles in two of the 1-year intervals of 2015 to 2016 and 2016 to 2017 that declined in

earnings, as shown in this manufacturing table, and for mining in previous Table 10 on page 10. All industry, as shown in Table 9 on page 9, experienced one percentile with earnings decline in the 2015 to 2016 1-year interval. Chart 11a below illustrates these earnings changes for manufacturing.

Chart 11a. Manufacturing Percentage Change Job Quarterly Earnings by Percentile, in 1-Year Intervals: 2015 to 2018

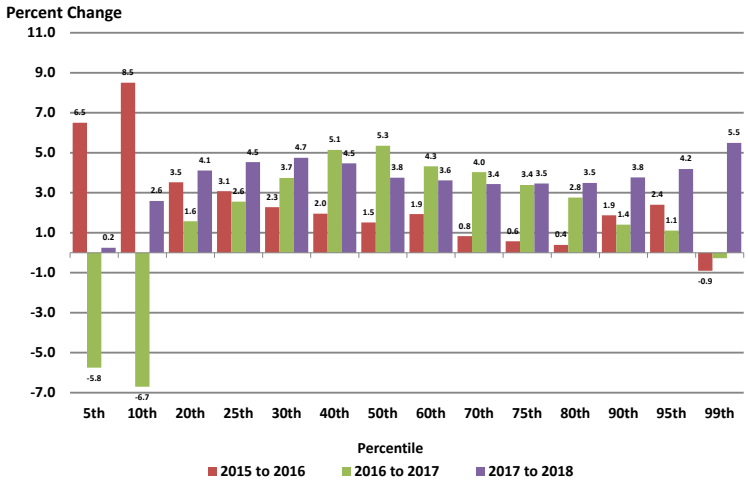


Chart 11a shows that in manufacturing different regions in the range of fourteen percentiles have the five larger percent earnings change increases for the different 1-year intervals. The 2015 to 2016 interval has the five larger size percent earnings change in its lowest 5th percentile through 25th percentiles and a fifth highest in its high 95th percentile. The 2016 to 2017 interval has the five larger size percentile increases in the lower 30th to mid-upper 70th percentile region. The 2017 to 2018 1-year interval has two areas with the higher percentile earnings percent change: the lower 25th through mid-40th percentiles and the highest two 95th and 99th percentiles.

Table 12. Health Percentage Change of Quarterly Job Earnings by Percentile, in 1-Year Intervals: 2015 to 2018

Percentile	2015	2016	2017	2018	2015-16 % Change	2016-17 % Change	2017-18 % Change
5th	$792	$808	$817	$821	2.0	1.1	0.5
10th	$1,411	$1,441	$1,436	$1,450	2.1	-0.3	1.0
20th	$2,937	$3,018	$3,000	$3,013	2.8	-0.6	0.4
25th	$3,732	$3,871	$3,869	$3,886	3.7	-0.1	0.4
30th	$4,455	$4,612	$4,662	$4,693	3.5	1.1	0.7
40th	$5,680	$5,877	$6,045	$6,111	3.5	2.9	1.1
50th	$6,905	$7,130	$7,372	$7,432	3.3	3.4	0.8
60th	$8,427	$8,694	$9,009	$9,025	3.2	3.6	0.2
70th	$10,671	$11,011	$11,449	$11,470	3.2	4.0	0.2
75th	$12,082	$12,447	$13,032	$13,112	3.0	4.7	0.6
80th	$13,813	$14,201	$14,894	$15,031	2.8	4.9	0.9
90th	$19,100	$19,662	$20,643	$20,738	2.9	5.0	0.5
95th	$27,342	$28,228	$29,097	$29,085	3.2	3.1	0.0
99th	$83,545	$86,451	$87,622	$86,581	3.5	1.4	-1.2
Total Jobs	**182,923**	**185,235**	**188,223**	**187,521**	**1.3**	**1.6**	**-0.4**

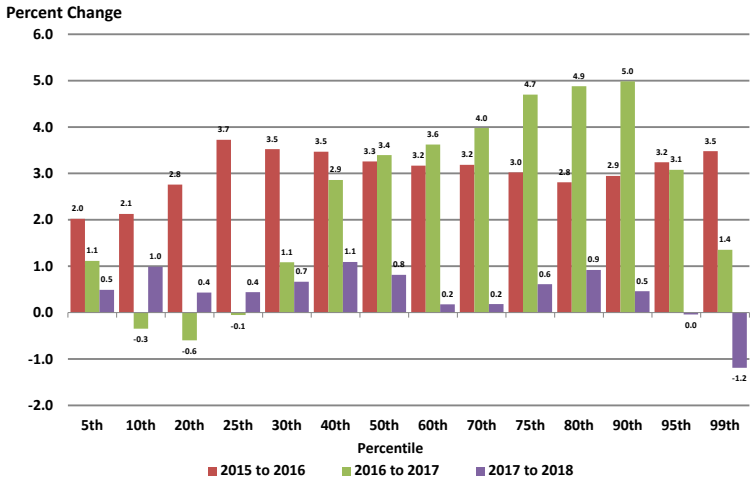
Note[1]: The unit of analyis is a job and earnings are second quarter job totals, excluding Federal jobs.

Note[2]: Cases where earnings are less than $300 removed.

As determined by the earnings percent change in the median 50th percentiles, Table 12 shows that health had the largest earnings percentile changes in the 2016 to 2017 1-year interval, as did mining and manufacturing. As noted before, all industry tied for its largest percent earnings change in the 2015 to

2016 and in its most recent 2017 to 2018 and 1-year interval. Health had earnings percentile declines in the 2016 to 2017 interval and the 2017 to 2018 1-year interval. As shown in their tables on page 9 and 10, mining and manufacturing also had percentiles with earnings percent declines in the 2016 to 2017 interval, and additionally had percentile declines in the 2015 to 2016 1-year interval. All industry in Table 9 on page 9 only had one percentile with earnings percent decline in the 2015 to 2016 1-year interval. Below, Chart 12b illustrates three 1-year interval earnings changes for health.

Chart 12a. Health Percentage Change of Quarterly Job Earnings by Percentile, in 1-Year Intervals: 2015 to 2018



In Chart 12a, health experienced the five highest percentile earnings percent change in different percentile ranges in each of the three 1-year intervals. For the 2015 to 2016 1-year interval the lower 25th through the mid-50th percentiles had the larger percent earnings change. The 2016 to 2017 1-year interval, experienced its larger percent change in the mid-60th through the upper 90th percentiles. Finally, the 2017 to 2018 1-year interval had the greater health earnings percent change in two areas, with three percentiles in the 30th through mid-50th percentiles and two in the two upper 75th and 80th percentiles.

V. Summary and Conclusions

This report's analysis examined percentile earnings and earnings change by an aggregate of all industry, and the three industries of mining, manufacturing and health. These four industry categories were investigated for earnings and earnings change, by the 10-year, 3-year and 1-year intervals for the years 2008 through 2018. Each of the four industry categories' 10-year interval earnings changes were also compared for 2006 to 2016, 2007 and 2017 and 2008 to 2018; the former two 10-year intervals were in two of our previous three reports on percentile earnings and earnings change.

In a comparison of all industry, mining, manufacturing and health earnings change for the three 10-year intervals of 2008 to 2018, with 2006 to 2016 and 2007 to 2017 and the latter two 10-year intervals from our two previous analyses and reports established the following. For all four industry categories, the larger median 50th percentile earnings percent change for 2008 to 2018 by descending rank were mining, manufacturing, health and all industries. In our just previous 2007 to 2017 interval the rank was the same in descending order of mining, manufacturing, health and all industries. In the previous oldest of the three reports, as measured by the median 50th percentile the rank for the 2006 to 2016 10-year interval by descending rank in earnings change were mining, health, all industry and manufacturing.

Comparing the four industry categories percentile earnings changes by 10-year interval also determined that in all three 10-year intervals of 2006 to 2016, 2007 to 2017 and 2008 to 2018 the five largest percentile earnings changes for mining and manufacturing tended to fall in the lower half of the percentile range. In the three 10-year intervals all industry and health split their highest five percentile earnings change between high and the low ends of the 14 percentile range, with three of the five most often falling in the lower half of the percentile range and two of the five largest most often falling in the upper end of the 14 percentile range. The one exception of this for the all industry and health was where all industry in the 2006 to 2016 10-year interval, having two percentiles falling in the lower half and three percentiles fell in the upper half of the fourteen percentile range.

The four industry categories of all industry, mining, manufacturing and health the earnings change for the three 3-year intervals of 2009 to 2012, 2012 to 2015 and 2015 to 2018 were compared, with the findings summarized as follows. Comparing by the four industry categories median 50th percentiles for the 2015 to 2018 3-year interval the decreasing rank for the earnings percent change was mining, manufacturing, health and all industry. When comparing the same for the four industry categories for the 2012 to 2015 interval the descending rank was mining, health, all industry and manufacturing. Comparing by the four industry categories median 50th percentiles for the 2009 to 2012 3-year interval the decreasing rank was manufacturing, mining, all industry and health. Also in the year 2009 to 2012 3-year interval mining experienced a large earnings percent decline, in the 99th percentile, while manufacturing earnings percent declined in the lower 5th and 10 percentiles.

Examining and comparing the four industry categories by 3-year intervals also determined that each of the three 3-year intervals displayed different patterns for the larger five percentile change. In the most recent 2015 to 2018 interval all five percentiles fell somewhere in the middle percentile range of 25th to 75, in all industry, mining and manufacturing, while health split the five of the larger earning percentiles with two in the 40th and 50th percentiles and three in the mid-upper percentile range in the 75th through 90th percentiles. In the 2012 to 2015 3-year interval in all industry all five of the larger earnings percent change were somewhere in the 50th and above percentiles; while mining, manufacturing and health split the five highest percentiles between upper and lower ends of the 14 percentile range, mining and manufacturing with three towards the upper end of the percentile range and health with three of the larger five percentiles below the 50th median percentile. In the remaining 2009 to 2012 3-year interval, the five larger percentile earnings change for all industry fell in the upper 75th and higher percentile range, for mining and manufacturing the five larger percentiles fell somewhere in the lower 30th to upper 80th percentile range, and for health the pattern for the five larger percentile earnings percent change was one percentile in the lower percentile range and the other four of the five percentiles split distributed in the upper 70th, 75th, 95th and 99th percentiles.

In a comparison of all industry, mining, manufacturing and health earnings change for the three 1-year intervals of 2008 to 2018, with 2006 to 2016 and 2007 to 2017 the median 50th percentile earning percent change was used to determine industry descending size rank. In the 2017 to 2018 1-year interval the rank was manufacturing, all industry, mining and health, in the 2016 to 2017 interval the rank was mining, manufacturing, health and all industry and in the 2015 to 2016 1-year interval the descending rank size of the median 50th percentile earnings percent change was health, all industry, mining and manufacturing, with the ranking scrambled for each of the three 1-year intervals to the next.

Analyzing and comparing the four industry categories by 1-year intervals also determined that each of the three 1-year intervals displayed different patterns for the larger five percentile changes. In the 2017 to 2018 interval, all industry's five larger percentile changes were scattered in the 40th to the 95th percentile range; mining's five larger percentiles had two at the lower end and three at the upper end of the percentile range; manufacturing had three at the 40th and immediately lower percentiles and two of the five larger percentiles at the extreme upper end. In the same 1-year interval, health had three of its five

larger percentile earnings percent changes in the lower 30th to the mid-50th percentile range and two in the mid-upper 75th and 80th percentiles. In the 2016 to 2017 1-year interval all industry's five larger percentiles fell immediately above the median 50th percentile; mining and manufacturing's five largest percentiles were on and straddled the 50th median percentile, with two on each side; and health's five largest percentiles in earnings change fell in the 60th and immediately above percentile range.

Continuing the comparison of the four industry categories in the 2015 to 2016 1-year interval, for pattern of distribution of the five higher percentiles in earnings percent change determined that all industries five percentiles fell in the lower 10th through 40th percentiles; in mining and manufacturing four of their five largest percentiles fell in the extreme lower percentile range with one for mining falling in the upper 99th percentile and one for manufacturing falling in the upper 95th percentile. In this same 1-year interval, health experienced four of the larger five percentiles earning percent change falling in the lower 25th to the mid-50th percentiles and the remaining one of the five larger percentiles in earnings percent change in the extreme upper 99th percentile.

Three conclusions can be readily stated using the findings of this analysis for all industry, mining, manufacturing and health 2008 to 2018 10-year interval comparisons and comparisons with the previous two 10-year findings; as well as the comparisons made of these four industry categories in their 10-year, 3-year and 1-year analysis comparisons. First, all three industry groups of mining, health and manufacturing play an important role in the health and vigor of Oklahoma economy. For example, during the three 10-year intervals as well as the 3-year and 1-year intervals, manufacturing displayed first a decreasing then an increasing role in Oklahoma's economy, depending on which time interval was being examined. Third, an industry job percentile earnings and earnings change analysis provides much more information and specific detailed information, than does a normal evaluation using averages or median earnings.