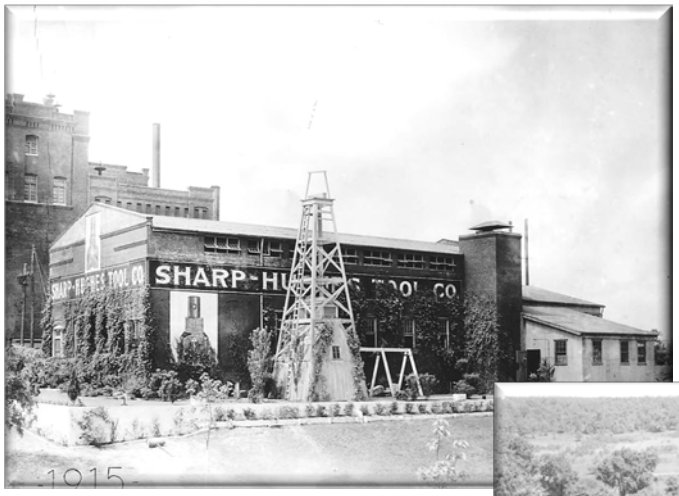
2021

Oklahoma Job Quarterly Earnings Percentile Changes

All Industries, Mining, Manufacturing and Health for Years 2009 to 2019



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 2009 to 2019
(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 2009 and 2019 as well as several years in between are included. The data set does not include federal jobs.

This report is an update of four previous year 2005 to 2015, 2006 to 2016, 2007 to 2017 and 2008 to 2018 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 industry'); 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 2009 to 2019

Table 1 shows the job quarterly earnings and percentile change of an aggregate of all industries between the 2nd quarter 2009 and the 2nd quarter 2019.

Table 1. All Industry Percentage Change of Quarterly Job Earnings by Percentile, in 10-Year Interval: 2009 to 2019

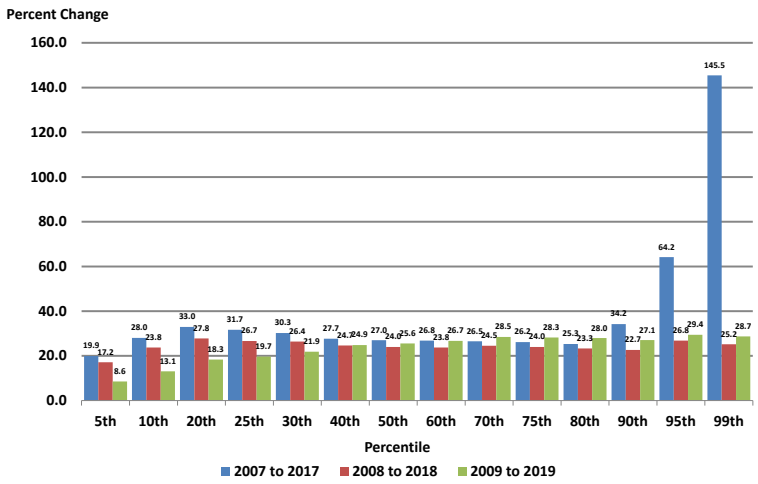
Percentile	2009	2019	Numeric Change	Percent Change
5th	$631	$685	$54	8.6
10th	$1,038	$1,174	$136	13.1
20th	$2,088	$2,471	$383	18.3
25th	$2,723	$3,259	$536	19.7
30th	$3,388	$4,130	$742	21.9
40th	$4,697	$5,865	$1,168	24.9
50th	$5,990	$7,522	$1,532	25.6
60th	$7,415	$9,394	$1,979	26.7
70th	$9,179	$11,794	$2,615	28.5
75th	$10,361	$13,289	$2,928	28.3
80th	$11,812	$15,116	$3,304	28.0
90th	$16,267	$20,672	$4,405	27.1
95th	$20,790	$26,906	$6,116	29.4
99th	$39,682	$51,083	$11,401	28.7
Total Jobs	**1,587,094**	**1,759,690**	**172,596**	**10.9**

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 industry's percentile earnings changes for the three 10-year intervals of 2007 to 2017, 2008 to 2018 and 2009 to 2019 in comparison.

Chart 1a. All Industry Job Quarterly Earnings Percentile Percent Change, Three 10-Year Interval Comparisons: 2007 to 2017, 2008 to 2018 and 2009 to 2019



In the 2007 to 2017 10-year interval the two percentiles with the largest increases of all, is a 145.5 percent increase in the 99th and a 64.2 percent increase in the 95th percentile.[1] The 2008 to 2018 10-year interval has the two highest increases in the lower percentile 20th percentile and upper 95th percentile, with 27.8 and 26.8 percent change, respectively. The 2009 to 2019 ten-year interval showed the highest two earnings changes for the upper 95th and 99th percentiles, with the 30th and lower percentiles exhibiting the smaller change than their 2007 to 2017 and 2008 to 2018 ten-year interval counterparts.

Table 2. Mining Percentage Change of Quarterly Job Earnings by Percentile, in 10-Year Interval: 2009 to 2019

Percentile	2009	2019	Numeric Change	Percent Change
5th	$1,660	$2,058	$398	24.0
10th	$3,170	$4,156	$986	31.1
20th	$6,150	$8,400	$2,250	36.6
25th	$7,235	$9,971	$2,737	37.8
30th	$8,132	$11,360	$3,228	39.7
40th	$9,821	$14,000	$4,179	42.6
50th	$11,686	$16,488	$4,802	41.1
60th	$13,845	$19,028	$5,183	37.4
70th	$16,606	$22,276	$5,670	34.1
75th	$18,364	$24,409	$6,045	32.9
80th	$20,763	$27,000	$6,237	30.0
90th	$28,790	$35,707	$6,917	24.0
95th	$39,900	$47,018	$7,118	17.8
99th	$83,509	$89,329	$5,820	7.0
Total Jobs	**45,957**	**55,200**	**9,243**	**20.1**

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

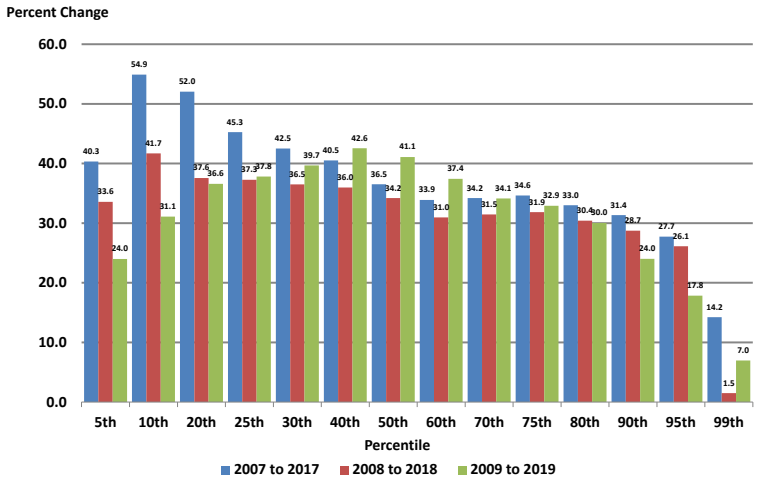
Note[2]: Cases where earnings are less than $300 removed.

Table 2 displays that for the 2009 to 2019 10-year interval the larger two percentile percent earnings changes occur in the 40th and the 50th percentiles, with the highest earnings percent change of 42.6 percent in the former and the second highest of 41.1 percent in the latter. The third highest earnings percent change of 39.7 percent occur in the 30th percentile.

The 2009 to 2019 mining 10-year interval is compared 2007 to 2017 and 2008 to 2018 in Chart 2a.

[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.

Chart 2a. Mining Job Quarterly Earnings Percentile Percent Change, Three 10-Year Interval Comparisons: 2007 to 2017, 2008 to 2018 and 2009 to 2019



The 10-year intervals of 2007 to 2017 and 2008 to 2018 both have their larger mining earnings percent change at the lower end of the percentile range, while the 10-year interval of 2009 to 2019 has its larger earnings in the middle percentile range. The 2007 to 2017 10-year interval has 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 25th 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. The 2009 to 2019 10-year interval has the highest earnings change of 42.6 percent in the 40th percentile, the second highest of 41.1 percent in the 50th and the third highest percent change of 39.7 percent in the 30th percentile.

Table 3 below, shows the percentile earnings and earnings change for manufacturing, for the 10-year interval of 2009 to 2019.

Table 3. Manufacturing Percentage Change of Quarterly Job Earnings by Percentile, in 10-Year Interval: 2009 to 2019

Percentile	2009	2019	Numeric Change	Percent Change
5th	$1,570	$1,717	$147	9.4
10th	$3,000	$3,574	$574	19.1
20th	$4,848	$6,435	$1,587	32.7
25th	$5,446	$7,315	$1,869	34.3
30th	$5,989	$8,078	$2,089	34.9
40th	$7,039	$9,513	$2,474	35.1
50th	$8,188	$11,022	$2,834	34.6
60th	$9,458	$12,754	$3,296	34.8
70th	$11,177	$14,983	$3,806	34.1
75th	$12,229	$16,323	$4,094	33.5
80th	$13,500	$17,991	$4,491	33.3
90th	$17,707	$23,301	$5,595	31.6
95th	$22,615	$29,668	$7,053	31.2
99th	$38,838	$49,057	$10,218	26.3
Total Jobs	**141,763**	**150,148**	**8,385**	**5.9**

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

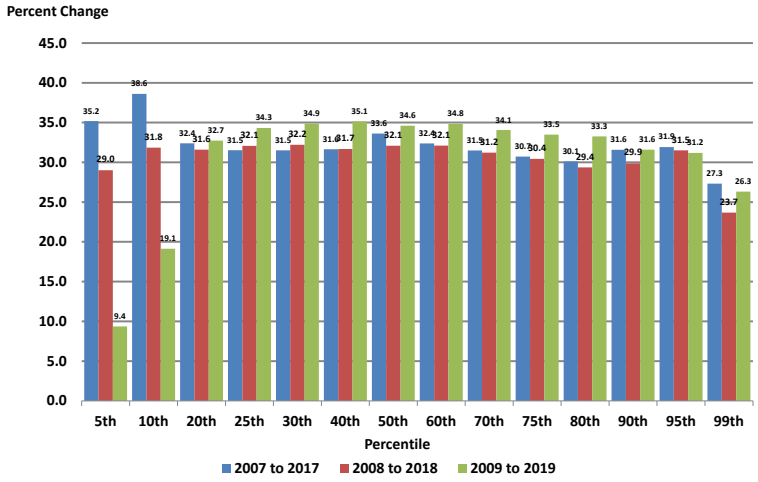
Note[2]: Cases where earnings are less than $300 removed.

Table 3 displays that most manufacturing percentiles percent change in this interval are larger in the middle percentiles, as did mining in this interval as shown in page 2 Table 2, while all industry has its larger earnings percent changes in the 70th percentile and higher. However, the changes in all industry shown on Table 1 on page 1 in this same interval are generally less than their counterpart percentiles in

the other two industries. Manufacturing has its largest percentile earnings percent change of 35.1 percent in the 40th percentile, its second largest percentile earnings change of 34.9 percent in the 30th percentile and the third largest percentile percent change of 34.8 percent in the 60th percentile in the 2009 to 2019 10-year interval.

Below, Chart 3a shows manufacturing 2009 to 2019 percentile changes in comparison to 2007 to 2017 and 2008 to 2018.

Chart 3a. Manufacturing Job Quarterly Earnings Percentile Percent Change, Three 10-Year Interval Comparisons: 2007 to 2017, 2008 to 2018 and 2009 to 2019



The 10-year interval manufacturing of 2007 to 2017 has the first and second largest earnings change in the lower two 10th and 5th percentiles. The 2008 to 2018 10-year interval has the largest earnings change of 32.2 percent in the 30th percentile, with the 25th, 50th and 60th percentiles having the second most, each with 32.1 percent earnings change. The 2009 to 2019 10-year interval has its largest earnings change in the 40th, the second largest in the 30th and the third largest percent earnings change in the 60th percentile of 35.1, 34.9, and 34.8 percent, respectively.

Table 4 below, shows the percentile earnings and earnings change for health, for the 10-year interval of 2009 to 2019.

Table 4. Health Percentage Change of Quarterly Job Earnings by Percentile, in 10-Year Interval: 2009 to 2019

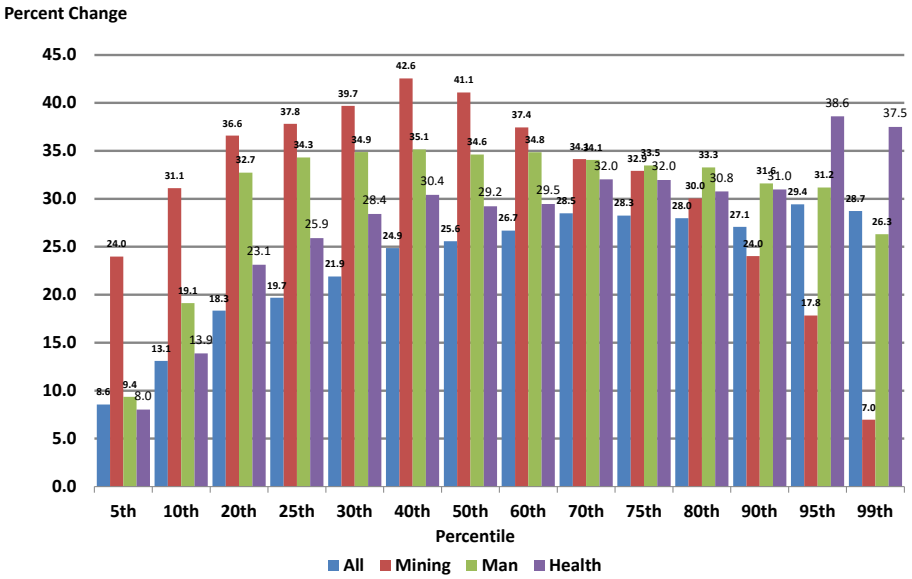
Percentile	2009	2019	Numeric Change	Percent Change
5th	$735	$794	$59	8.0
10th	$1,246	$1,419	$173	13.9
20th	$2,499	$3,077	$578	23.1
25th	$3,177	$4,000	$823	25.9
30th	$3,803	$4,884	$1,081	28.4
40th	$4,889	$6,376	$1,487	30.4
50th	$5,984	$7,733	$1,749	29.2
60th	$7,279	$9,423	$2,144	29.5
70th	$9,121	$12,042	$2,921	32.0
75th	$10,420	$13,750	$3,330	32.0
80th	$11,985	$15,672	$3,687	30.8
90th	$16,560	$21,689	$5,129	31.0
95th	$22,177	$30,737	$8,560	38.6
99th	$68,566	$94,273	$25,707	37.5
Total Jobs	**179,062**	**186,570**	**7,508**	**4.2**

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 4 reveals that the 95th percentile has the largest percent earnings change of 38.6 percent, the 99th percentile has the second largest change of 37.5 and with the 70th and 75th percentile tied for the 3rd largest percent earnings change of 32.0 percent. Below, Chart 4a compares the 10-year 2009 to 2019 percentile changes of all industry, manufacturing, mining, and health.

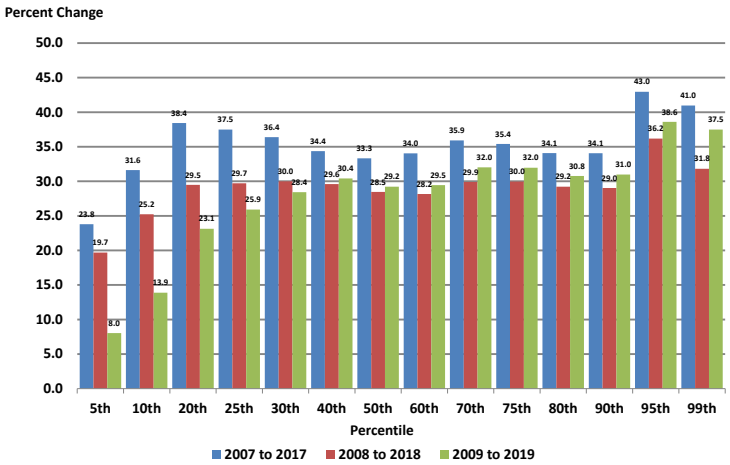
Chart 4a. All Industry, Mining, Manufacturng and Health Job Quarterly Earnings Percentile Percent Change, 10-Year Interval Comparisons: 2009 to 2019



Comparing the 10-year 2009 to 2019 intervals of the four industries we have examined, in rank order the percentile earnings percent change tended to be smallest in all industry percentiles (also on Table 1 page 1), next smallest in health (Table 4 page 4) percentiles, next to the largest in manufacturing (Table 3 page 3) percentiles and tended to be largest in the percentile counter parts in mining (above and in Table 2 page 2).

Chart 4b below, compares health's change in the 2007 to 2017, 2008 to 2018 and 2009 to 2019 intervals.

Chart 4b. Health Job Quarterly Earnings Percentile Percent Change, Three 10-Year Interval Comparisons: 2007 to 2017, 2008 to 2018 and 2009 to 2019



The 10-year interval health of 2007 to 2017 has the first and second largest earnings change in the upper

two 95th and 99th percentiles, of 43.0 percent and 41.0 percent, respectively. The 2008 to 2018 10-year interval also has the highest earnings change in the 95th percentile of 36.2 percent and the second highest in the 95th percentile of 31.8 percent earnings percent change. The 2009 to 2019 10-year interval as well has its largest earnings percent change of in the 95th and 99th percentile of 38.6 percent and 37.5 percent, respectively. All three 10-year intervals have their smaller earnings percent change in the lower percentiles.

III. Industry Percentile Job Quarterly Earnings: 3-Year Changes - Years 2009 to 2019

Table 5 shows the 3-year job quarterly earnings and earnings change by percentile of an aggregate of all industries between the 2nd quarter 2010 and the 2nd quarter 2019.

Table 5. All Industry Percentage Change of Quarterly Job Earnings by Percentile, in 3-Year Intervals: 20010 to 2019

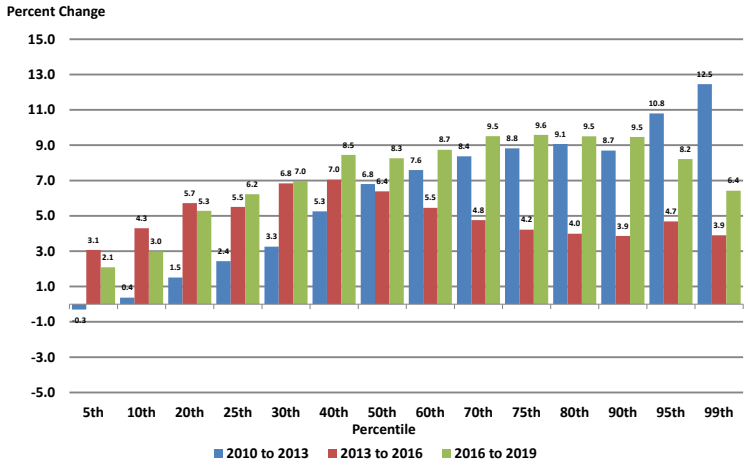
Percentile	2010	2013	2016	2019	2010-2013 % Change	2013-16 % Change	2016-19 % Change
5th	$653	$651	$671	$685	-0.3	3.1	2.1
10th	$1,089	$1,093	$1,140	$1,174	0.4	4.3	3.0
20th	$2,187	$2,220	$2,347	$2,471	1.5	5.7	5.3
25th	$2,839	$2,908	$3,068	$3,259	2.4	5.5	6.2
30th	$3,500	$3,614	$3,861	$4,130	3.3	6.8	7.0
40th	$4,800	$5,052	$5,408	$5,865	5.3	7.0	8.5
50th	$6,115	$6,531	$6,948	$7,522	6.8	6.4	8.3
60th	$7,614	$8,192	$8,639	$9,394	7.6	5.5	8.7
70th	$9,487	$10,281	$10,770	$11,794	8.4	4.8	9.5
75th	$10,693	$11,636	$12,127	$13,289	8.8	4.2	9.6
80th	$12,172	$13,275	$13,804	$15,116	9.1	4.0	9.5
90th	$16,728	$18,182	$18,884	$20,672	8.7	3.9	9.5
95th	$21,437	$23,751	$24,863	$26,906	10.8	4.7	8.2
99th	$41,084	$46,200	$48,000	$51,083	12.5	3.9	6.4
Total Jobs	**1,560,884**	**1,704,091**	**1,701,877**	**1,759,690**	**9.2**	**-0.1**	**3.4**

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 shown in Table 5, the first 3-year interval of 2010 to 2013 for all industry has the larger three percentile earnings percent increases in decreasing rank in the 99th, 95th and 80th percentiles. The second 3-year interval of 2013 to 2016 has the three larger size earnings percent changes in decreasing rank in the 40th, 30th and 50th percentiles. The third 3-year interval of 2016 to 2019 has the highest earnings percent change of 9.6 percent in the 75th percentile, and the second highest change of 9.5 percent in the 70th percentile. Chart 5a illustrates these changes.

Chart 5a All Industry Percentage Change of Quarterly Job Earnings by Percentile, in 3-Year Intervals: 2009 to 2019



Shown on the previous page, Chart 5a displays that different regions in the range of percentiles have the larger earnings percent change increases for the different 3-year intervals. The 2010 to 2013 interval has the five largest earnings changes in the 75th percentile and higher; the 2013 to 2016 interval has the five larger increases in its low-middle 20th to 60th percentiles; while the 2016 to 2019 3-year interval has the largest five earnings percent increases in the upper 60th through the 90th percentiles, with three of the latter percentiles tying for a 9.5 percent change. Comparing the earnings change 50th percentile earnings percent changes for the three 3-year intervals determines that the 2016 to 2019 have the largest earnings change for that percentile. 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: 2010 to 2019

Percentile	2010	2013	2016	2019	2010-2013 % Change	2013-16 % Change	2016-19 % Change
5th	$1,500	$1,675	$2,101	$2,058	11.7	25.4	-2.0
10th	$3,000	$3,347	$4,182	$4,156	11.6	24.9	-0.6
20th	$6,300	$6,960	$7,832	$8,400	10.5	12.5	7.3
25th	$7,585	$8,287	$9,100	$9,971	9.3	9.8	9.6
30th	$8,607	$9,426	$10,268	$11,360	9.5	8.9	10.6
40th	$10,421	$11,674	$12,391	$14,000	12.0	6.1	13.0
50th	$12,311	$13,878	$14,759	$16,488	12.7	6.4	11.7
60th	$14,635	$16,350	$17,307	$19,028	11.7	5.9	9.9
70th	$17,433	$19,262	$20,363	$22,276	10.5	5.7	9.4
75th	$19,301	$21,182	$22,396	$24,409	9.7	5.7	9.0
80th	$21,830	$23,550	$24,988	$27,000	7.9	6.1	8.1
90th	$29,403	$31,692	$34,626	$35,707	7.8	9.3	3.1
95th	$40,072	$42,601	$47,500	$47,018	6.3	11.5	-1.0
99th	$80,332	$77,063	$96,878	$89,329	-4.1	25.7	-7.8
Total Jobs	**46,807**	**66,750**	**47,597**	**55,200**	**42.6**	**-28.7**	**16.0**

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.

Comparing the mining median 50th percentile earnings changes in Table 6 with those for all industry in Table 5, reveals that the largest earnings changes for mining occur in the 2010 to 2013, while for all industry the largest earnings changes is in the 3-year interval of 2016 to 2019, for this percentile.

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 2019

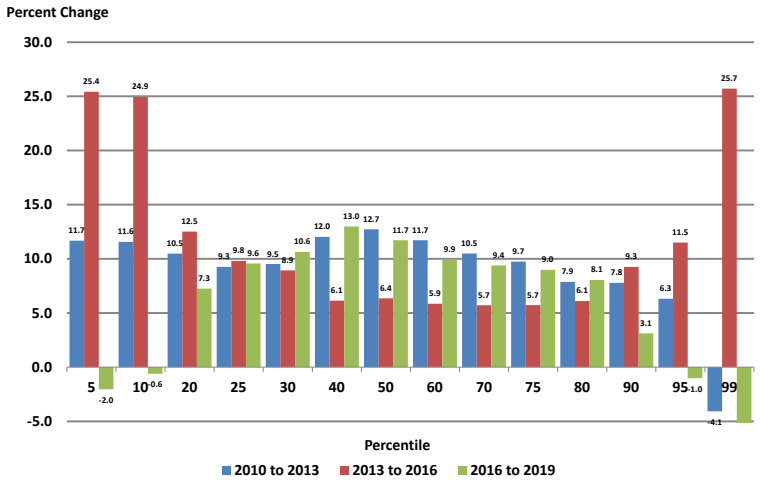


Chart 6a reveals that, as in all industry, in mining the different 3-year intervals have a different section of the percentile range with the higher earnings change. The 2010 to 2013 3-year interval has the higher five

earnings percent change in the 40th percentile to 60th percentiles and the lower 5th and 10th percentiles, with the 99th percentile displaying a decline. The 2013 to 2016 has the five larger earnings percent changes in lower 5th through 20th and the highest 95th and 99th percentiles. The 2016 to 2019 3-year interval has the largest five earnings percent changes in the middle 25th and mid-60th percentiles, with the 95th and 99th percentiles exhibiting declines. 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: 2010 to 2019

Percentile	2010	2013	2016	2019	2010-2013 % Change	2013-16 % Change	2016-19 % Change
5th	$1,512	$1,568	$1,704	$1,717	3.7	8.7	0.8
10th	$3,005	$3,213	$3,502	$3,574	6.9	9.0	2.1
20th	$5,078	$5,510	$5,843	$6,435	8.5	6.0	10.1
25th	$5,775	$6,287	$6,607	$7,315	8.9	5.1	10.7
30th	$6,409	$6,978	$7,271	$8,078	8.9	4.2	11.1
40th	$7,631	$8,253	$8,558	$9,513	8.2	3.7	11.2
50th	$8,895	$9,627	$9,984	$11,022	8.2	3.7	10.4
60th	$10,309	$11,212	$11,663	$12,754	8.8	4.0	9.4
70th	$12,062	$13,287	$13,692	$14,983	10.2	3.0	9.4
75th	$13,162	$14,567	$15,000	$16,323	10.7	3.0	8.8
80th	$14,538	$16,005	$16,508	$17,991	10.1	3.1	9.0
90th	$18,668	$20,740	$21,800	$23,301	11.1	5.1	6.9
95th	$23,397	$26,124	$27,853	$29,668	11.7	6.6	6.5
99th	$40,617	$46,948	$46,307	$49,057	15.6	-1.4	5.9
Total Jobs	**133,166**	**149,349**	**139,624**	**150,148**	**12.2**	**-6.5**	**7.5**

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.

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 7 reveals that manufacturing, and all industry have their largest earnings change in the 2016 to 2019 interval; while mining has the largest 3-year earnings change in the 50th percentile in the 2010 to 2013 interval. Chart 7a below, shows manufacturing's 3-year earnings changes.

Chart 7a. Manufacturing Percentage Change of Quarterly Job Earnings by Percentile, in 3-Year Intervals: 2010 to 2019

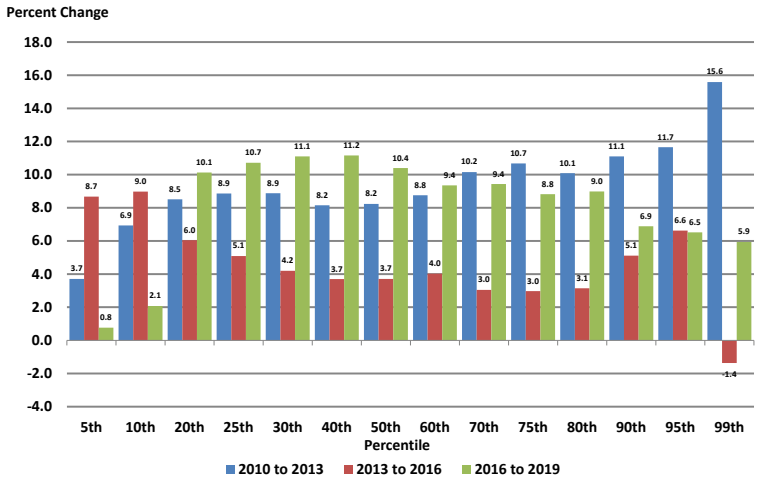


Chart 7a for manufacturing also displays that each of the three 3-year intervals has different sections of the percentile ranges with the larger earnings change. For the 2010 to 2013 3-year interval the upper 75th through the 99th percentiles have the five largest percent earnings change. The 2013 to 2016 3-year interval has their four largest increases in percent earnings in the lower 5th thru 20th percentiles, and the upper 95th percentile, with the 25th and the 90th percentiles having a 5.1 percent tie for 5th earnings

percent change; the upper 99th percentile displays a 1.4 percent decrease. The 2016 to 2019 3-year interval has the five largest manufacturing percentile earnings size percent change, in the mid-lower 20th percentile to the 50th percentile. Comparing the median 50th percentile earnings change for the three 3-year interval determined that the 2016 to 2019 interval has the largest change of 10.5 percent, while the 2013 to 2016 interval has the lowest 50th percentile earnings percent change of 3.7 percent.

Table 8. Health Percentage Change of Quarterly Job Earnings by Percentile, in 3-Year Intervals: 2010 to 2019

Percentile	2010	2013	2016	2019	2010-2013 % Change	2013-16 % Change	2016-19 % Change
5th	$754	$790	$808	$794	4.8	2.3	-1.7
10th	$1,300	$1,384	$1,441	$1,419	6.5	4.1	-1.5
20th	$2,625	$2,861	$3,018	$3,077	9.0	5.5	2.0
25th	$3,305	$3,619	$3,871	$4,000	9.5	7.0	3.3
30th	$3,928	$4,288	$4,612	$4,884	9.2	7.6	5.9
40th	$5,000	$5,411	$5,877	$6,376	8.2	8.6	8.5
50th	$6,097	$6,566	$7,130	$7,733	7.7	8.6	8.5
60th	$7,461	$8,018	$8,694	$9,423	7.5	8.4	8.4
70th	$9,363	$10,109	$11,011	$12,042	8.0	8.9	9.4
75th	$10,711	$11,501	$12,447	$13,750	7.4	8.2	10.5
80th	$12,294	$13,071	$14,201	$15,672	6.3	8.6	10.4
90th	$16,926	$17,940	$19,662	$21,689	6.0	9.6	10.3
95th	$22,791	$24,600	$28,228	$30,737	7.9	14.7	8.9
99th	$70,148	$77,911	$86,451	$94,273	11.1	11.0	9.0
Total Jobs	**181,032**	**186,551**	**185,235**	**186,570**	**3.0**	**-0.7**	**0.7**

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.

Table 8 shows that in health the 3-year interval of 2013 to 2016 experienced the highest median 50th percentile earnings change of 8.6 percent. The 2016 to 2019 3-year interval with a median 50th percentile change of 8.5 percent change is second, with the lower two percentiles displaying earnings decreases. The 2010 to 2013 3-year interval is last in the median 50th percentile earnings change comparisons, with a 7.7 percent earnings change.

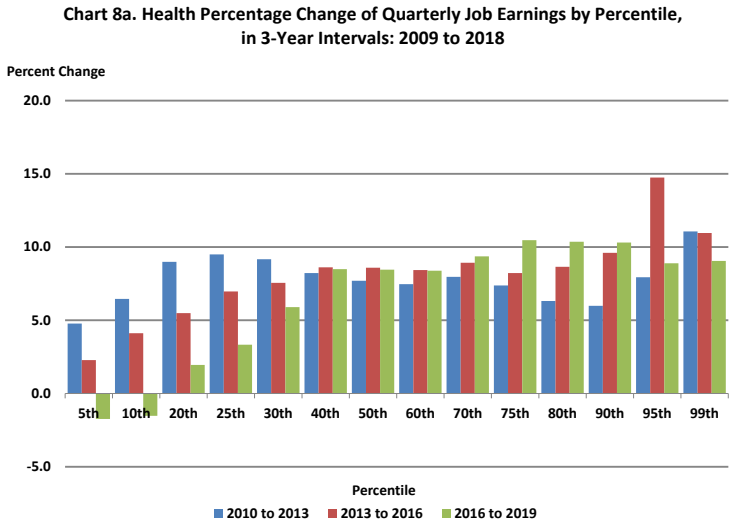


Chart 8a displays that in the 2010 to 2013 3-year interval five of the fourteen percentiles with the larger changes are in the mid-lower 20th and 40th percentiles. In the 2013 to 2016 3-year interval the percentiles with the five largest changes are in the upper 90th to 99th percentile, the mid-upper 70th percentile and the 40th, 50th and 80th percentiles tied for fifth largest, having an 8.6 percent earnings change. The percentiles with the five largest percent earnings changes in the 2016 to 2019 3-year interval is the 70th to 90th percentiles, with the 95th percentile showing the fifth largest percent change; the 5th and 10th percentiles display decreases.

When comparing health median 50th percentile earnings change in these four discussed industries, Table 8 on page 9 shows that health has the larger size percentile earnings change in the 2013 to 2016 3-year interval. Table 6 on page 7 shows that mining has its largest earnings change in the 2010 to 2013 3-year interval. Table 5 on page 6 shows that all industry experienced its largest change in the 2016 to 2019 interval, with Table 7 on page 8 displaying that manufacturing has its largest earnings percent change in the same 3-year interval. Comparing the median 50th percentile earnings changes of four industry categories in the most recent 3-year interval of 2016 to 2019, identifies that mining experience the larger earnings percent change in this interval.

IV. Industry Percentile Job Quarterly Earnings: 1-Year Changes - Years 2016 to 2019

Table 9 shows three 1-year job quarterly earnings and percentile change of an aggregate of all industries between the 2nd quarter 2016 and the 2nd quarter 2019.

Table 9. All Industry Percentage Change of Quarterly Job Earnings by Percentile, in 1-Year Intervals: 2016 to 2019

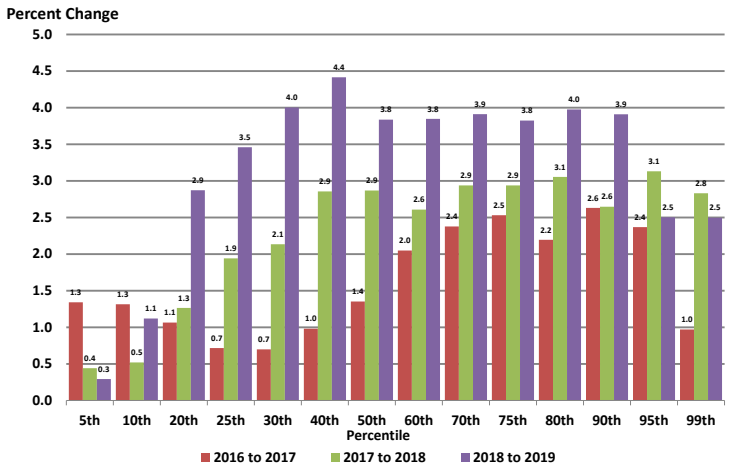
Percentile	2016	2017	2018	2019	2016-17 % Change	2017-18 % Change	2018-19 % Change
5th	$671	$680	$683	$685	1.3	0.4	0.3
10th	$1,140	$1,155	$1,161	$1,174	1.3	0.5	1.1
20th	$2,347	$2,372	$2,402	$2,471	1.1	1.3	2.9
25th	$3,068	$3,090	$3,150	$3,259	0.7	1.9	3.5
30th	$3,861	$3,888	$3,971	$4,130	0.7	2.1	4.0
40th	$5,408	$5,461	$5,617	$5,865	1.0	2.9	4.4
50th	$6,948	$7,042	$7,244	$7,522	1.4	2.9	3.8
60th	$8,639	$8,816	$9,046	$9,394	2.0	2.6	3.8
70th	$10,770	$11,026	$11,350	$11,794	2.4	2.9	3.9
75th	$12,127	$12,434	$12,800	$13,289	2.5	2.9	3.8
80th	$13,804	$14,107	$14,538	$15,116	2.2	3.1	4.0
90th	$18,884	$19,381	$19,894	$20,672	2.6	2.6	3.9
95th	$24,863	$25,452	$26,249	$26,906	2.4	3.1	2.5
99th	$48,000	$48,466	$49,838	$51,083	1.0	2.8	2.5
Total Jobs	**1,701,877**	**1,716,953**	**1,746,541**	**1,759,690**	**0.9**	**1.7**	**0.8**

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.

Table 9 displays the all industry 1-year earnings change that has occurred in 2016 to 2019 years, showing that there are several ties in these intervals in the 14 percentiles. Comparing the median 50th percentile for the three intervals reveals that with 3.8 percent earnings change, the 2018 to 2019 interval is the largest. With 2.9 percent 2017 to 2018 has the second largest change, and with 1.4 percent the 2016 to 2017 1-year interval has the smallest median 50th percentile earnings change.

Chart 9a. All Industry Percentage Change of Quarterly Job Earnings by Percentile, in 1-Year Intervals: 2016 to 2019



On the previous page, Chart 9a displays that in the three 1-year intervals, all industry experienced the two percentiles with the largest change in different parts of the 14-percentile range. In the 2016 to 2017 1-year interval the largest change is in the 90th percentile with 2.6 percent and the second largest change in the 75th percentile with 2.5 percent earnings change. 2017 to 2018 has its largest change with a tie in the 80th and 95th percentiles of 3.1 percent and with the four 40th, 50th, 70th, and 80th percentiles having the second largest change of 2.9 percent. The 2018 to 2019 1-year interval has its largest earnings percent change in the 40th percentile of 4.4 percent change and the 30th and 80th percentiles tied for the second largest change with 4.0 percent. Table 10 displays the same three 1-year change for mining.

Table 10. Mining Percentage Change of Quarterly Job Earnings by Percentile, in 1-Year Intervals: 2016 to 2019

Percentile	2016	2017	2018	2019	2016-17 % Change	2017-18 % Change	2018-19 % Change
5th	$2,101	$1,837	$1,890	$2,058	-12.6	2.9	8.9
10th	$4,182	$3,749	$3,854	$4,156	-10.3	2.8	7.8
20th	$7,832	$7,800	$7,905	$8,400	-0.4	1.3	6.3
25th	$9,100	$9,400	$9,609	$9,971	3.3	2.2	3.8
30th	$10,268	$10,793	$11,023	$11,360	5.1	2.1	3.1
40th	$12,391	$13,350	$13,644	$14,000	7.7	2.2	2.6
50th	$14,759	$15,680	$16,124	$16,488	6.2	2.8	2.3
60th	$17,307	$18,216	$18,632	$19,028	5.2	2.3	2.1
70th	$20,363	$21,398	$21,902	$22,276	5.1	2.4	1.7
75th	$22,396	$23,488	$24,035	$24,409	4.9	2.3	1.6
80th	$24,988	$25,938	$26,577	$27,000	3.8	2.5	1.6
90th	$34,626	$34,386	$35,411	$35,707	-0.7	3.0	0.8
95th	$47,500	$45,567	$47,889	$47,018	-4.1	5.1	-1.8
99th	$96,878	$88,590	$96,016	$89,329	-8.6	8.4	-7.0
Total Jobs	**47,597**	**52,292**	**58,110**	**55,200**	**9.9**	**11.1**	**-5.0**

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.

Comparing the median 50th percentile in Table 10 shows that in mining the 1-year interval of 2016 to 2017 experienced the highest earnings change of the three 1-year intervals of 6.2 percent change, followed by the 2017 to 2018 1-year interval's change of 2.8 percent and the 2018 to 2019 1-year interval's median 50th percentile earnings change of 2.3 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: 2016 to 2019

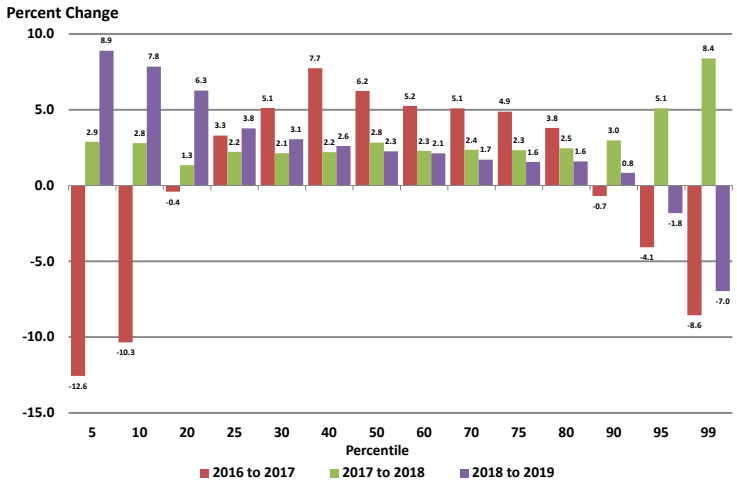


Chart 10a for mining displays that each of the three 1-year intervals has different sections of the

percentile ranges with the five larger percentile earnings change. For the 2016 to 2017 1-year interval the mid-lower 30th through the mid-upper 70th percentiles have the larger change. In the 2016 to 2017 1-year interval, the five larger percentile changes are the lower 10th, median 50th and the 90th and above percentiles. Finally, the 2018 to 2019 1-year interval has the percentiles with the five larger mining earnings percent change the 30th and lower percentiles. The 2016 to 2017 1-year interval experienced percentiles with earnings percent decreases, at both the upper and lower ends of the 14-percentile range, while the 2018 to 2019 experienced percentiles with earnings percent declines in the upper two percentiles.

Table 11. Manufacturing Percentage Change of Quarterly Job Earnings by Percentile, in 1-Year Intervals: 2016 to 2019

Percentile	2016	2017	2018	2019	2015-16 % Change	2016-17 % Change	2017-18 % Change
5th	$1,704	$1,606	$1,610	$1,717	-5.8	0.2	6.6
10th	$3,502	$3,267	$3,351	$3,574	-6.7	2.6	6.6
20th	$5,843	$5,935	$6,179	$6,435	1.6	4.1	4.1
25th	$6,607	$6,776	$7,083	$7,315	2.6	4.5	3.3
30th	$7,271	$7,543	$7,901	$8,078	3.7	4.7	2.2
40th	$8,558	$8,998	$9,400	$9,513	5.1	4.5	1.2
50th	$9,984	$10,518	$10,913	$11,022	5.3	3.8	1.0
60th	$11,663	$12,167	$12,607	$12,754	4.3	3.6	1.2
70th	$13,692	$14,244	$14,733	$14,983	4.0	3.4	1.7
75th	$15,000	$15,509	$16,045	$16,323	3.4	3.5	1.7
80th	$16,508	$16,963	$17,555	$17,991	2.8	3.5	2.5
90th	$21,800	$22,106	$22,939	$23,301	1.4	3.8	1.6
95th	$27,853	$28,161	$29,340	$29,668	1.1	4.2	1.1
99th	$46,307	$46,180	$48,717	$49,057	-0.3	5.5	0.7
Total Jobs	**139,624**	**140,377**	**143,583**	**150,148**	**0.5**	**2.3**	**4.6**

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 has its largest earnings changes in the 1-year interval of 2016 to 2017, as did mining. However, both manufacturing and mining have some percentiles in this period that declined in earnings, with manufacturing it is the 2016 to 2017 interval. As shown in previous Table 10 for mining it is the 2016 to 2017 and the 2017 to 2018 1-year intervals. As shown in Table 9, all industry did not experience any percentiles with earnings percent declines. Chart 11a below illustrates these earnings changes for manufacturing.

Chart 11a. Manufacturing Percentage Change Job Quarterly Earnings by Percentile, in 1-Year Intervals: 2016 to 2019

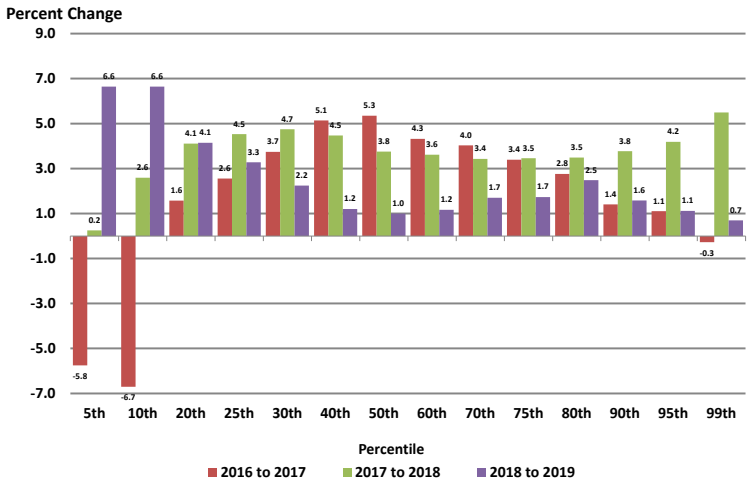


Chart 11a shows for manufacturing different regions in the range of fourteen percentiles have the larger five percent earnings change for the different 1-year intervals. The 2016 to 2017 interval has the larger percent earnings change in middle 30th through the 70th percentile range, with decreases at both the lower and upper percentiles. The 2017 to 2018 interval has the larger five percentile increases in the upper two percentiles, and the mid-lower 25th through the 40th three percentiles. The 2018 to 2019 1-year interval has the highest three percentile earnings percent change in the lower end 5th through the 25th percentiles and the 80th percentile. Table 12 shows the 1-year interval changes for health.

Table 12. Health Percentage Change of Quarterly Job Earnings by Percentile, in 1-Year Intervals: 2016 to 2019

Percentile	2016	2017	2018	2019	2016-17 % Change	2017-18 % Change	2018-19 % Change
5th	$808	$817	$821	$794	1.1	0.5	-3.3
10th	$1,441	$1,436	$1,450	$1,419	-0.3	1.0	-2.2
20th	$3,018	$3,000	$3,013	$3,077	-0.6	0.4	2.1
25th	$3,871	$3,869	$3,886	$4,000	-0.1	0.4	2.9
30th	$4,612	$4,662	$4,693	$4,884	1.1	0.7	4.1
40th	$5,877	$6,045	$6,111	$6,376	2.9	1.1	4.3
50th	$7,130	$7,372	$7,432	$7,733	3.4	0.8	4.1
60th	$8,694	$9,009	$9,025	$9,423	3.6	0.2	4.4
70th	$11,011	$11,449	$11,470	$12,042	4.0	0.2	5.0
75th	$12,447	$13,032	$13,112	$13,750	4.7	0.6	4.9
80th	$14,201	$14,894	$15,031	$15,672	4.9	0.9	4.3
90th	$19,662	$20,643	$20,738	$21,689	5.0	0.5	4.6
95th	$28,228	$29,097	$29,085	$30,737	3.1	0.0	5.7
99th	$86,451	$87,622	$86,581	$94,273	1.4	-1.2	8.9
Total Jobs	**185,235**	**188,223**	**187,521**	**186,570**	**1.6**	**-0.4**	**-0.5**

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.

In Table 12, comparing the median 50th percentiles of each of the three intervals reveals that with 4.1 percent the 2018 to 2019 has the largest change, with 3.4 percent the 2016 to 2017 has the second largest change, and at 0.8 percent the 2017 to 2018 has the smallest median 50th percentile earnings percent change. 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: 2016 to 2019

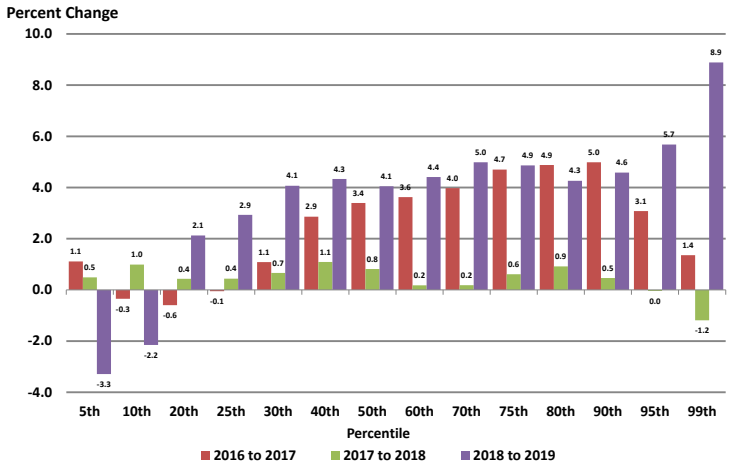


Chart 12a displays that health has one or more percentiles in each of the three 1-year intervals with decreases in earnings percent change. The 2016 to 2017 has its earnings percent declines in the 10th through the 25th percentiles, the 2017 to 2018 has its earnings decline in the 99th percentile and the 2018 to 2019 1-year interval has its earnings percent decreases in the 5th and 10th percentiles. Comparing the

median 50th percentiles, with 4.1 percent the 2018 to 2019 is the largest, 3.4 percent in 2016 to 2017 has the second largest, and with 0.8 percent the 2017 to 2018 has the third largest earnings percent 1-year change.

V. Summary and Conclusions

This report's analysis examined percentile earnings and earnings change by an aggregate of all industries, 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 2009 through 2019. Each of the four industry categories' 10-year interval earnings changes were also compared for 2007 and 2017, 2008 to 2018 and 2009 to 2019; the former two 10-year intervals are in two of our previous four 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 2009 to 2019, with 2007 to 2017 and 2008 to 2018, the latter two 10-year intervals take from our two previous analyses and reports, established the following. For all four industry categories, the larger median 50th percentile earnings percent change for 2009 to 2019 ranked in descending order are mining, manufacturing, health, and all industry. In our previous 2008 to 2018 interval the rank is the same in descending order of mining, manufacturing, health, and all industry. In the previous oldest of the three reports as measured by the median 50th percentile, the rank for these in the 2007 to 2017 10-year interval in earnings change by descending order are also mining, manufacturing, health, and all industry. However, in the latter interval the median 50th percentiles percent range between mining and health is only 2.9%, and between manufacturing and health only 0.3%.

Comparing the four industry categories percentile earnings changes by 10-year interval also determined that in all three 10-year intervals of 2007 to 2017, 2008 to 2018 and 2009 to 2019 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 has its larger percentiles falling in the upper half percentile range in 2009 to 2019 and in 2007 to 2017. With health its larger earnings changes are in the upper half percentile range in 2009 to 2019 and split its five largest percentile earnings percent change in the 2007 to 2017 and the 2008 to 2018 10-year range.

In this analysis, the four industry categories of all industry, mining, manufacturing, and health their earnings change for the three 3-year intervals of 2010 to 2013, 2013 to 2016 and 2016 to 2019 were also compared, with the findings summarized as follows. Comparing the four industry categories by median 50th percentiles for the 2016 to 2019 3-year interval the decreasing order rank for the earnings percent change was mining, manufacturing, health, and all industry. When comparing the same for the four industry categories for the 2013 to 2016 interval health has the largest, all industry and mining tied for second largest, with manufacturing having the third largest earnings percent change. Comparing by the four industry categories' median 50th percentiles for the 2010 to 2013 3-year interval the decreasing rank order was mining, manufacturing, health, and all industry.

Continuing the four industry three 3-year interval comparisons, in the year 2010 to 2013 3-year interval mining experienced earnings percent declines, in the 99th percentile, and also in the 2016 to 2019 3-year interval experienced declines in the two smallest and the two largest percentiles, while in this interval health experienced earnings precent declines in the lowest two percentiles. All industry and manufacturing each experienced one percentile with earnings declines, the former in the 2010 to 2013 in the 5th percentile and the latter industry in the 2013 to 2016 3-year interval in the 99th percentile.

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 all industry, the larger five percentile changes are in the upper half percentile range in the 2010 to 2013 and in the 2013 to 3019 3-year interval, while in the 2013 to 2016 3-year interval these five largest are in the lower half percentile range. In mining the larger five percentile changes are in the middle and lower half percentile range in the 2010 to 2013 3-year range, split between the lower and upper percentile ends in the 2013 to 2016 interval and in the 2016 to 2019 3-year interval are in the upper lower half and middle percentiles. In manufacturing the five larger percentiles are in the upper percentile in the 2010 to the 2013 3-year interval, in the lower percentiles and 95th percentile in the 2013 to 2016 interval, and in the upper lower percentiles in the 2016 to 2019 3-year range. In health the 2013 to 2016 and the 2016 to 2019 3-year intervals have their largest five percentile earnings change in the upper half percentile range, while in the 2010 to the 2013 has it largest five percentile changes in the mid-lower percentiles and in the 99th percentile.

A comparison of all industry, mining, manufacturing, and health earnings change for the three 1-year intervals of 2018 to 2019, 2017 to 2018 and 2016 to 2017 using the median 50th percentile earnings percent change determined the industry descending size rank. In the 2018 to 2019 interval the descending rank is health, a tie in all industry and manufacturing for the second rank and mining following for third. In the 2017 to 2018 interval the descending rank size is manufacturing, all industry, mining, and health. In the four industries in the 2016 to 2017 1-year interval the descending rank size is mining, health, manufacturing, and all industry in their median 50th percentile earnings percent change.

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 2018 to 2019 interval, the five largest percentiles of earnings percent change for all industry is in the middle and mid-upper percentiles, health are in the upper percentiles, mining are in the extreme lower percentiles, and manufacturing is in the extreme lower and the 80th percentile of the 14-percentile range. In the 2017 to 2018 interval, all industry's five largest percentiles are scattered in the 40th through the 90th percentiles with several duplicate values, health is in the mid-upper and upper percentiles, mining's are in the upper and in the 10th and 50th percentiles, and manufacturing's are in the upper lower and the upper two percentiles. In the 2016 to 2019 interval all industry's five largest percentiles are in the 70th through the 95th percentiles, health's are in 60th through the 90th percentiles, mining's are the upper and, in the 10th, and the 50th percentiles and manufacturing's percentiles are in the middle 30th through the 70th percentiles.

It is of note that in these three 1-year intervals, mining, and manufacturing both experienced two or more percentiles, while health experienced earnings percent declines in one or more percentiles in all three 1-year intervals. When these earnings declines occur, it is usually at the upper or lower ends of the 14-percentile ranges. All industry did not experience any percentiles with income declines in the three 1-year periods.

Three conclusions can be readily stated using the findings of this analysis for all industry, mining, manufacturing and health 2009 to 2019 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 robustness of Oklahoma's economy. Second, these industries appear to 'jostle' for the lead position in their earnings contributions to the economy at different chronological times during the three 10-year intervals as well as in the 3-year and 1-year intervals. 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.