

# ON THE MONEY

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A Hannah News Service Publication

Vol. 131, No. 3

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February 13, 2015

## Ohio Employment Before and After the Recession

Monthly employment statistics reveal that Ohio employment declined 414,000 during the recession, and increased 327,000 since the beginning of 2010 when employment growth resumed. Valuable questions are how the jobs gained compare to those lost, and how earnings have changed for the workers in those jobs.

This issue of *On the Money* answers those questions by looking at employment in a different way from that considered in previous articles. Those articles analyzed employment by industry – where one works regardless of what one does. This article considers employment by occupation – what one does regardless of where one works. Occupational employment and wages are available from the Bureau of Labor Statistics, but only annually and only for May. This article compares occupational employment in Ohio and in the Cincinnati, Cleveland, and Columbus metropolitan areas in May 2007 and May 2013 – the most recent statistics currently available.

### Classifying Occupational Employment

The more than 800 identified occupations are classified by the federal government's Standard Occupational Classification (SOC) system into 23 broad occupational groups. These are:

- 11-0000: Management occupations
- 13-0000: Business and financial operations occupations
- 15-0000: Computer and mathematical science occupations
- 17-0000: Architecture and engineering occupations
- 19-0000: Life, physical, and social science occupations
- 21-0000: Community and social services occupations
- 23-0000: Legal occupations
- 25-0000: Education, training, and library occupations
- 27-0000: Arts, design, entertainment, sports, and media occupations
- 29-0000: Healthcare practitioners and technical occupations
- 31-0000: Healthcare support occupations
- 33-0000: Protective service occupations
- 35-0000: Food preparation and serving related occupations
- 37-0000: Building and grounds cleaning and maintenance occupations
- 39-0000: Personal care and service occupations
- 41-0000: Sales and related occupations
- 43-0000: Office and administrative support occupations

- 45-0000: Farming, fishing, and forestry occupations
- 47-0000: Construction and extraction occupations
- 49-0000: Installation, maintenance, and repair occupations
- 51-0000: Production occupations
- 53-0000: Transportation and material moving occupations
- 55-0000: Military specific occupations

The statistics do not include farm employment or military employment, so group 45 includes only fishing, forestry, and natural resources occupations and group 55 does not appear at all.

## Statewide Employment and Wages

Table 1<sup>1</sup> shows employment by occupational group in 2007 and 2013, together with the numerical and percentage change and the U.S. percentage change. Also shown is the location quotient of the occupational group's employment. The location quotient is a measure of relative concentration. It is the percentage of total Ohio employment in a specific occupational group divided by the percentage of total national employment in that occupational group. Thus, a location quotient greater than one indicates an employment concentration greater than average.

Total employment in Ohio was four percent less in May 2013 than in May 2007, while U.S. employment was only 1.3 percent less. This is largely due to the employment decline during the recession rather than the growth afterward: the recession hit Ohio particularly hard, while growth during the recovery has been much closer to the national average. One noteworthy change at the occupational level is in management positions, which increased 27 percent, triple the U.S. growth. Community and social service occupations; arts, entertainment, sports, and media occupations; and healthcare support occupations also outperformed the respective U.S. growth rates. Other occupational groups underperformed, with the crucial production and transportation occupations off more than 16 percent. (Once again, this is more a result of steep recession losses rather than weak post-recession gains.)

The location quotients for these occupational groups are consistent with industry-based location quotients that show the Ohio economy's strong focus on manufacturing and distribution. Production and transportation jobs both appear in greater numbers than would be expected in an economy Ohio's size. Medical practitioner and support occupations also have particularly high location quotients. Analysis of employment by occupation rather than industry includes medical personnel working outside of a healthcare setting, including schools, factories, and insurance companies. Once again, these statistics omit farming, so the location quotient in farming, fishing, and forestry occupations is misleadingly low.

The Occupational Employment Statistics also include average wages and wage distributions for most occupations.<sup>2</sup> A different database, the U.S. Employment Projections, provides the typical education level required for entry into a given occupation, along with any requirements for experience in a related occupation and job training. Combining these data with the wage data from the Occupational Employment Statistics allows an exploration of changes in the number of positions by skill and education level and the average annual wage.

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<sup>1</sup> All tables are in the Appendix at the end of the article.

<sup>2</sup> Wages are not reported for occupations with few positions, where the estimate would have a high margin of error.

This is shown for the state in Table 2. The number of jobs not requiring a degree declined by more than 335,000 while the number of jobs requiring a degree increased nearly 92,000. As a result, the percentage of all jobs in the state requiring a degree for entry increased from 23.4 percent to 26.3 percent. Jobs requiring more than short-term on-the-job training saw double-digit declines, while those requiring work experience or vocational training saw double-digit increases. Experience also mattered in degree-requiring jobs; the number of jobs requiring only a bachelor's degree declined by an insignificant amount, while those requiring both a degree and experience increased 30 percent.

Wage levels are determined both by the value of occupational output and by the demand and supply of workers available to fill positions in the occupation. Table 2 shows that degrees are richly rewarded, with jobs requiring a degree paying on average more than twice as much as those not requiring a degree. More complex jobs also pay more, with wages rising as the amount of training required to perform the jobs increases. However, workers in non-degree requiring jobs as a class have suffered since 2007; the overall average wage for these positions declined 4.6 percent while the average for degree-requiring jobs declined only 0.9 percent. Experience mattered in wage levels as well as in numbers; wages for jobs requiring experience were considerably higher than those not requiring experience (although average wages declined).

### **Occupational Employment and Wage and Skill Needs in Ohio's Major Metropolitan Areas**

The Occupational Employment Statistics are also available for Metropolitan Statistical Areas (MSAs), allowing the analysis to be localized to the regional level. This article focuses on Ohio's three largest MSAs, Cincinnati, Cleveland, and Columbus – although smaller MSAs could also be analyzed. Tables 3 through 8 replicate Tables 1 and 2 for each of these three MSAs.

Comparing occupational employment, the Cincinnati MSA (which also includes counties in Kentucky and Indiana) experienced a smaller net loss of jobs than the state, while Cleveland's loss was greater. Columbus, on the other hand, had 20,000 more jobs in 2013 than in 2007. These findings are consistent with the industry employment-based analyses in earlier editions of *On the Money*. The location quotients reveal that administrative occupations (management, business and financial, and office and administrative support) are a stronger focus in Cincinnati and Columbus than in Cleveland, production occupations are more common in Cincinnati and Cleveland than in Columbus, while transportation occupations are more common in Cincinnati and Columbus.

All three MSAs experienced a sizeable increase in management occupations. Business and financial operations occupations increased at rates greater than the 10.7 percent national average in Cincinnati and Columbus, but were flat in Cleveland. Computer and mathematical jobs, however, increased at an above-average rate in Cleveland – not so in Cincinnati and Columbus. The large office and administrative support occupational group declined in all three MSAs as it did nationally, but by more than average in Cincinnati and Cleveland and much less than average in Columbus. Columbus also suffered declines in production and transportation occupations that were somewhat less than those in Cincinnati and Cleveland.

Turning to the employment and wage by skill level tables, the distribution of jobs shifted from non-degree to degree in all three MSAs, but the shift was especially pronounced in Cincinnati, where non-degree jobs declined 54,000 while degree jobs increased 26,000. All three MSAs

saw the same general pattern of more training-intensive jobs declining proportionally more than entry-level jobs.

It is not correct to compare wage levels for a given training/education level across MSAs and draw conclusions about general wage levels because the distribution of specific jobs is different, meaning that wages should also be different. Validly reaching such conclusions requires a detailed comparison of wages in individual occupations. However, these tables show that the premiums for education and experience are comparable across the three MSAs.

The fact that the number of lower-skill jobs and the wages for these jobs have both declined suggests that the supply of lower-skill workers has not declined as rapidly as the demand. In Columbus specifically, many have wondered why the poverty rate remains stubbornly high despite the region's robust job growth. This pattern is a possible answer to that question. Meanwhile, the average wage for entry-level jobs in all three MSAs is in the neighborhood of \$26,000 per year, or \$12.50 per hour – much less than a household-sustaining level. (For statistical reasons, the amount that the typical worker earns in these jobs is even less than the average.) Workers must cobble together multiple jobs and work more than a 40-hour week – and rely on public and private assistance – in order to supply their basic needs. A long-term answer to this problem is an increased investment in job readiness and job training programs. These make workers more productive, which both pushes up their wages and makes their employers more competitive. Over time, these programs would also reduce the excess supply of lower-skill workers.

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## APPENDIX

**Table 1**  
**Ohio Occupational Employment, May 2007 and May 2013**

Occupational group	May 2007		May 2013		Ohio change		U.S. chng.
	Employmt.	LQ*	Employmt.	LQ*	Number	Percent	Percent
<b>All occupations</b>	<b>5,341,360</b>	<b>1.000</b>	<b>5,125,850</b>	<b>1.000</b>	<b>-215,510</b>	<b>-4.0%</b>	<b>-1.3%</b>
Management	189,300	0.892	241,000	1.029	51,700	27.3%	9.0%
Business and financial operations	223,400	0.934	236,330	0.918	12,930	5.8%	10.7%
Computer and mathematical science	115,260	0.908	130,630	0.914	15,370	13.3%	15.8%
Architecture and engineering	88,240	0.893	86,680	0.942	-1,560	-1.8%	-4.2%
Life, physical, and social science	37,030	0.742	31,880	0.727	-5,150	-13.9%	-9.6%
Community and social services	62,510	0.877	68,570	0.933	6,060	9.7%	6.1%
Legal	31,730	0.799	30,500	0.757	-1,230	-3.9%	4.3%
Education, training, and library	314,370	0.951	316,100	0.973	1,730	0.6%	1.0%
Arts, entertainment, sports & media	54,510	0.778	56,630	0.833	2,120	3.9%	-0.2%
Healthcare practitioners	308,760	1.129	342,310	1.142	33,550	10.9%	12.8%
Healthcare support	182,050	1.263	200,280	1.320	18,230	10.0%	8.3%
Protective service	116,090	0.946	109,110	0.866	-6,980	-6.0%	5.5%
Food preparation and serving	473,580	1.057	477,060	1.036	3,480	0.7%	5.7%
Building and grounds cleaning	164,990	0.942	155,950	0.940	-9,040	-5.5%	-2.6%
Personal care and service	108,470	0.817	110,710	0.718	2,240	2.1%	19.4%
Sales and related	546,770	0.960	510,750	0.939	-36,020	-6.6%	-1.8%
Office and administrative support	884,490	0.956	807,430	0.974	-77,060	-8.7%	-7.9%
Farming, fishing, and forestry	5,210	0.293	3,970	0.236	-1,240	-23.8%	-2.8%
Construction and extraction	199,590	0.748	161,190	0.819	-38,400	-19.2%	-24.2%
Installation, maintenance & repair	216,800	1.012	195,550	0.984	-21,250	-9.8%	-4.7%
Production	579,700	1.437	485,370	1.432	-94,330	-16.3%	-13.6%
Transportation and material moving	438,510	1.146	367,860	1.057	-70,650	-16.1%	-6.5%

\*Location quotient.

Source: Occupational Employment Statistics, U.S. Bureau of Labor Statistics.

**Table 2**  
**Ohio Employment and Average Wages by Occupational Skill/Education Level, 2007 and 2013**

	Total employment				Change	Average wage	
	May 2007		May 2013			2007*	2013
	Total	Pct. of total	Total	Pct. of total			
<b>Non-degree</b>	<b>4,073,110</b>	<b>76.6%</b>	<b>3,737,540</b>	<b>73.7%</b>	<b>-8.2%</b>	<b>33,956</b>	<b>32,388</b>
Short-term on-the-job training	2,127,450	40.0%	2,054,680	40.5%	-3.4%	26,538	25,984
Moderate-term on-the-job training	1,076,520	20.3%	705,280	13.9%	-34.5%	39,392	38,050
Long-term on-the-job training	328,660	6.2%	245,400	4.8%	-25.3%	44,711	41,753
Related work experience	312,710	5.9%	393,040	7.7%	25.7%	51,787	46,473
Postsecondary vocational award	227,770	4.3%	339,140	6.7%	48.9%	37,541	36,311
<b>Degree</b>	<b>1,242,840</b>	<b>23.4%</b>	<b>1,334,460</b>	<b>26.3%</b>	<b>7.4%</b>	<b>73,846</b>	<b>73,170</b>
Associate degree	231,000	4.3%	244,170	4.8%	5.7%	58,062	55,191
Bachelor's degree	652,470	12.3%	643,930	12.7%	-1.3%	64,814	64,542
Degree plus experience	185,290	3.5%	241,470	4.8%	30.3%	105,577	96,240
Master's degree	79,820	1.5%	76,910	1.5%	-3.6%	64,517	65,014
Doctoral degree	35,460	0.7%	59,640	1.2%	68.2%	81,859	75,847
First professional degree	58,800	1.1%	68,340	1.3%	16.2%	143,906	144,040

\*Inflated to 2013 dollars using the Gross Domestic Product Implicit Price Deflator for Personal Consumption Expenditures, U.S. Bureau of Economic Analysis.

Source: Derived from data from Occupational Employment Statistics and U.S. Employment Projections, Bureau of Labor Statistics.

**Table 3**  
**Cincinnati MSA Occupational Employment, May 2007 and May 2013**

Occupational group	May 2007		May 2013		Cincinnati MSA change		U.S. chng.
	Employmt.	LQ*	Employmt.	LQ*	Number	Percent	Percent
<b>All occupations</b>	<b>1,026,900</b>	<b>1.000</b>	<b>995,170</b>	<b>1.000</b>	<b>-31,730</b>	<b>-3.1%</b>	<b>-1.3%</b>
Management	41,850	0.912	53,360	1.087	11,510	27.5%	9.0%
Business and financial operations	48,730	1.060	55,180	1.104	6,450	13.2%	10.7%
Computer and mathematical science	26,790	1.098	28,950	1.044	2,160	8.1%	15.8%
Architecture and engineering	19,000	1.000	18,700	1.046	-300	-1.6%	-4.2%
Life, physical, and social science	8,180	0.852	7,440	0.873	-740	-9.0%	-9.6%
Community and social services	10,950	0.799	11,990	0.840	1,040	9.5%	6.1%
Legal	5,990	0.785	6,320	0.808	330	5.5%	4.3%
Education, training, and library	56,640	0.891	56,310	0.893	-330	-0.6%	1.0%
Arts, entertainment, sports & media	12,370	0.919	11,990	0.909	-380	-3.1%	-0.2%
Healthcare practitioners	56,990	1.084	64,570	1.109	7,580	13.3%	12.8%
Healthcare support	29,510	1.065	32,970	1.119	3,460	11.7%	8.3%
Protective service	19,330	0.819	20,170	0.825	840	4.3%	5.5%
Food preparation and serving	94,880	1.101	96,590	1.080	1,710	1.8%	5.7%
Building and grounds cleaning	31,230	0.928	27,920	0.867	-3,310	-10.6%	-2.6%
Personal care and service	23,800	0.932	24,350	0.814	550	2.3%	19.4%
Sales and related	107,360	0.980	100,610	0.953	-6,750	-6.3%	-1.8%
Office and administrative support	179,510	1.009	163,800	1.018	-15,710	-8.8%	-7.9%
Farming, fishing, and forestry	520	0.152	380	0.116	-140	-26.9%	-2.8%
Construction and extraction	40,400	0.788	30,380	0.796	-10,020	-24.8%	-24.2%
Installation, maintenance & repair	41,380	1.004	37,190	0.964	-4,190	-10.1%	-4.7%
Production	87,670	1.130	74,460	1.132	-13,210	-15.1%	-13.6%
Transportation and material moving	83,820	1.139	71,530	1.058	-12,290	-14.7%	-6.5%

\*Location quotient.

Source: Occupational Employment Statistics, U.S. Bureau of Labor Statistics.

**Table 4**  
**Cincinnati MSA Employment and Average Wages by Occupational Skill/Education Level, 2007 and 2013**

	Total employment				Change	Average wage	
	May 2007		May 2013			2007*	2013
	Total	Pct. of total	Total	Pct. of total			
<b>Non-degree</b>	<b>751,050</b>	<b>75.4%</b>	<b>697,180</b>	<b>72.0%</b>	<b>-7.2%</b>	<b>34,533</b>	<b>33,284</b>
Short-term on-the-job training	405,470	40.7%	393,670	40.6%	-2.9%	26,962	26,618
Moderate-term on-the-job training	183,860	18.5%	115,600	11.9%	-37.1%	40,617	40,024
Long-term on-the-job training	59,890	6.0%	43,580	4.5%	-27.2%	44,563	44,232
Related work experience	60,030	6.0%	82,940	8.6%	38.2%	53,403	47,050
Postsecondary vocational award	41,800	4.2%	61,390	6.3%	46.9%	39,746	36,969
<b>Degree</b>	<b>245,270</b>	<b>24.6%</b>	<b>271,440</b>	<b>28.0%</b>	<b>10.7%</b>	<b>76,601</b>	<b>75,756</b>
Associate degree	42,800	4.3%	46,430	4.8%	8.5%	59,254	55,729
Bachelor's degree	127,590	12.8%	133,870	13.8%	4.9%	66,050	66,938
Degree plus experience	40,980	4.1%	53,040	5.5%	29.4%	111,902	101,695
Master's degree	14,750	1.5%	13,910	1.4%	-5.7%	65,735	64,378
Doctoral degree	6,990	0.7%	10,870	1.1%	55.5%	84,526	81,696
First professional degree	12,160	1.2%	13,320	1.4%	9.5%	138,022	137,925

\*Inflated to 2013 dollars using the Gross Domestic Product Implicit Price Deflator for Personal Consumption Expenditures, U.S. Bureau of Economic Analysis.

Source: Derived from data from Occupational Employment Statistics and U.S. Employment Projections, Bureau of Labor Statistics.



**Table 5  
Cleveland MSA Occupational Employment, May 2007 and May 2013**

Occupational group	May 2007		May 2013		Cleveland MSA change		U.S. chng.
	Employmt.	LQ*	Employmt.	LQ*	Number	Percent	Percent
<b>All occupations</b>	<b>1,059,760</b>	<b>1.000</b>	<b>1,010,190</b>	<b>1.000</b>	<b>-49,570</b>	<b>-4.7%</b>	<b>-1.3%</b>
Management	39,830	0.841	50,900	1.021	11,070	27.8%	9.0%
Business and financial operations	49,770	1.049	50,330	0.992	560	1.1%	10.7%
Computer and mathematical science	22,620	0.899	27,930	0.992	5,310	23.5%	15.8%
Architecture and engineering	16,800	0.857	16,330	0.900	-470	-2.8%	-4.2%
Life, physical, and social science	8,300	0.838	5,210	0.602	-3,090	-37.2%	-9.6%
Community and social services	12,470	0.882	12,390	0.855	-80	-0.6%	6.1%
Legal	8,860	1.125	7,980	1.005	-880	-9.9%	4.3%
Education, training, and library	58,700	0.895	58,340	0.912	-360	-0.6%	1.0%
Arts, entertainment, sports & media	10,930	0.787	11,070	0.826	140	1.3%	-0.2%
Healthcare practitioners	64,000	1.180	75,880	1.284	11,880	18.6%	12.8%
Healthcare support	34,960	1.223	41,730	1.396	6,770	19.4%	8.3%
Protective service	28,970	1.189	25,780	1.039	-3,190	-11.0%	5.5%
Food preparation and serving	85,520	0.962	88,270	0.972	2,750	3.2%	5.7%
Building and grounds cleaning	32,900	0.947	31,670	0.969	-1,230	-3.7%	-2.6%
Personal care and service	22,590	0.858	23,270	0.766	680	3.0%	19.4%
Sales and related	109,420	0.968	99,330	0.927	-10,090	-9.2%	-1.8%
Office and administrative support	190,830	1.040	163,630	1.002	-27,200	-14.3%	-7.9%
Farming, fishing, and forestry	420	0.119	380	0.115	-40	-9.5%	-2.8%
Construction and extraction	35,180	0.665	29,460	0.760	-5,720	-16.3%	-24.2%
Installation, maintenance & repair	40,450	0.951	37,120	0.948	-3,330	-8.2%	-4.7%
Production	105,850	1.323	91,880	1.376	-13,970	-13.2%	-13.6%
Transportation and material moving	80,370	1.058	61,280	0.893	-19,090	-23.8%	-6.5%

\*Location quotient.

Source: Occupational Employment Statistics, U.S. Bureau of Labor Statistics.

**Table 6  
Cleveland MSA Employment and Average Wages by Occupational Skill/Education Level, 2007 and 2013**

	Total employment				Change	Average wage	
	May 2007		May 2013			2007*	2013
	Total	Pct. of total	Total	Pct. of total			
<b>Non-degree</b>	<b>779,170</b>	<b>75.6%</b>	<b>716,420</b>	<b>72.9%</b>	<b>-8.1%</b>	<b>35,484</b>	<b>33,436</b>
Short-term on-the-job training	409,840	39.7%	392,990	40.0%	-4.1%	27,394	26,740
Moderate-term on-the-job training	199,670	19.4%	134,800	13.7%	-32.5%	41,676	39,272
Long-term on-the-job training	61,570	6.0%	49,040	5.0%	-20.4%	47,554	42,808
Related work experience	60,940	5.9%	75,780	7.7%	24.4%	54,847	48,263
Postsecondary vocational award	47,150	4.6%	63,810	6.5%	35.3%	38,793	37,539
<b>Degree</b>	<b>252,060</b>	<b>24.4%</b>	<b>266,240</b>	<b>27.1%</b>	<b>5.6%</b>	<b>77,016</b>	<b>75,790</b>
Associate degree	48,090	4.7%	52,790	5.4%	9.8%	61,043	59,111
Bachelor's degree	132,120	12.8%	125,580	12.8%	-5.0%	67,404	67,012
Degree plus experience	39,850	3.9%	48,420	4.9%	21.5%	112,625	99,899
Master's degree	15,090	1.5%	15,820	1.6%	4.8%	66,301	70,006
Doctoral degree	3,700	0.4%	8,090	0.8%	118.6%	75,204	69,863
First professional degree	13,210	1.3%	15,540	1.6%	17.6%	136,630	137,243

\*Inflated to 2013 dollars using the Gross Domestic Product Implicit Price Deflator for Personal Consumption Expenditures, U.S. Bureau of Economic Analysis.

Source: Derived from data from Occupational Employment Statistics and U.S. Employment Projections, Bureau of Labor Statistics.

**Table 7  
Columbus MSA Occupational Employment, May 2007 and May 2013**

Occupational group	May 2007		May 2013		Columbus MSA change		U.S. chng.
	Employmt.	LQ*	Employmt.	LQ*	Number	Percent	Percent
<b>All occupations</b>	<b>920,470</b>	<b>1.000</b>	<b>940,940</b>	<b>1.000</b>	<b>20,470</b>	<b>2.2%</b>	<b>-1.3%</b>
Management	36,700	0.892	47,770	1.029	11,070	30.2%	9.0%
Business and financial operations	53,070	1.288	58,950	1.248	5,880	11.1%	10.7%
Computer and mathematical science	35,830	1.639	40,010	1.525	4,180	11.7%	15.8%
Architecture and engineering	15,310	0.899	14,590	0.864	-720	-4.7%	-4.2%
Life, physical, and social science	8,290	0.964	7,840	0.973	-450	-5.4%	-9.6%
Community and social services	9,650	0.786	11,820	0.876	2,170	22.5%	6.1%
Legal	7,610	1.112	6,820	0.923	-790	-10.4%	4.3%
Education, training, and library	49,180	0.863	56,580	0.949	7,400	15.0%	1.0%
Arts, entertainment, sports & media	11,280	0.935	13,230	1.060	1,950	17.3%	-0.2%
Healthcare practitioners	47,320	1.004	56,830	1.033	9,510	20.1%	12.8%
Healthcare support	28,690	1.155	32,990	1.185	4,300	15.0%	8.3%
Protective service	21,000	0.993	21,340	0.923	340	1.6%	5.5%
Food preparation and serving	82,040	1.062	84,060	0.994	2,020	2.5%	5.7%
Building and grounds cleaning	28,940	0.959	29,860	0.980	920	3.2%	-2.6%
Personal care and service	18,450	0.806	20,930	0.740	2,480	13.4%	19.4%
Sales and related	94,700	0.964	89,740	0.899	-4,960	-5.2%	-1.8%
Office and administrative support	169,260	1.062	165,000	1.084	-4,260	-2.5%	-7.9%
Farming, fishing, and forestry	900	0.293	830	0.269	-70	-7.8%	-2.8%
Construction and extraction	30,980	0.674	24,060	0.666	-6,920	-22.3%	-24.2%
Installation, maintenance & repair	34,680	0.939	30,200	0.828	-4,480	-12.9%	-4.7%
Production	62,710	0.902	58,050	0.933	-4,660	-7.4%	-13.6%
Transportation and material moving	73,870	1.120	69,440	1.087	-4,430	-6.0%	-6.5%

\*Location quotient.

Source: Occupational Employment Statistics, U.S. Bureau of Labor Statistics.

**Table 8**  
**Columbus MSA Employment and Average Wages by Occupational Skill/Education Level, 2007 and 2013**

	Total employment				Change	Average wage	
	May 2007		May 2013			2007*	2013
	Total	Pct. of total	Total	Pct. of total			
<b>Non-degree</b>	<b>656,530</b>	<b>73.9%</b>	<b>641,140</b>	<b>70.8%</b>	<b>-2.3%</b>	<b>34,660</b>	<b>32,735</b>
Short-term on-the-job training	384,480	43.3%	381,650	42.1%	-0.7%	27,376	26,486
Moderate-term on-the-job training	115,670	13.0%	105,780	11.7%	-8.6%	40,993	39,472
Long-term on-the-job training	35,160	4.0%	30,970	3.4%	-11.9%	44,829	42,461
Related work experience	80,060	9.0%	73,690	8.1%	-8.0%	51,420	48,342
Postsecondary vocational award	41,160	4.6%	49,050	5.4%	19.2%	43,616	37,245
<b>Degree</b>	<b>231,370</b>	<b>26.1%</b>	<b>264,320</b>	<b>29.2%</b>	<b>14.2%</b>	<b>76,025</b>	<b>76,039</b>
Associate degree	38,800	4.4%	43,680	4.8%	12.6%	55,437	55,740
Bachelor's degree	126,880	14.3%	135,290	14.9%	6.6%	68,412	66,572
Degree plus experience	34,780	3.9%	52,230	5.8%	50.2%	106,499	101,343
Master's degree	10,750	1.2%	12,230	1.4%	13.8%	66,200	65,027
Doctoral degree	9,380	1.1%	7,650	0.8%	-18.4%	84,273	82,371
First professional degree	10,780	1.2%	13,240	1.5%	22.8%	144,036	146,449

\*Inflated to 2013 dollars using the Gross Domestic Product Implicit Price Deflator for Personal Consumption Expenditures, U.S. Bureau of Economic Analysis.

Source: Derived from data from Occupational Employment Statistics and U.S. Employment Projections, Bureau of Labor Statistics.