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The Character of Ohio's Employment Growth

Employment has now been increasing since the beginning of 2010 – eight and a half years. Important question are what types of jobs have driven Ohio's employment growth and whether the employment growth has resulted in wage increases.

This issue of *On the Money* answers those questions by looking at employment in a different way. Typically, these articles consider employment by industry – where one works regardless of what one does. Here, however, we are focusing on 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 Statistical Areas (MSAs) in May 2010 and May 2016 – 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 Occupational Employment Statistics do not include farm 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 compares Ohio employment by occupational group in 2010 and 2016. (The width of these tables requires that they be shown separately in the Appendix at the end of the article.) The first point to emphasize about these statistics is that they are based on a sample, so all of the totals are associated with a margin of error. Generally, the margin of error is greater the smaller the employment total, so the totals for farming, fishing, and forestry occupations (and the associated employment changes) are particularly unreliable. On the other hand, the all-occupation estimates are probably quite close to the actual totals.

Total employment in Ohio was 416,200 (8.5 percent) greater in May 2016 than in May 2010. The higher-level business-related occupations (management and business and financial occupations) enjoyed particularly good growth. In contrast, the lower-level office and administrative support occupations were flat as increasing automation has reduced the need for these office-related positions. Possibly for a similar reason, healthcare practitioner occupations grew while healthcare support occupations did not. The Science, Technology, Engineering, and Math (STEM)-based computer, mathematical, engineering, and healthcare occupations also tended to grow at an above-average rate.

The Occupational Employment Statistics also include average wages and wage distributions for all occupational groups and most occupations.[1] The median annual wages are displayed in the right-hand columns. The 2010 wages are adjusted to 2016-equivalent dollars, so the net changes exclude inflation. In virtually all cases, these changes are negative, even for some of the occupational groups with strong growth. This may be surprising given the scale of that growth, but the severity of the 2007-2009 recession created a large degree of slack in the labor market that has only recently been absorbed. But the point is that many workers were earning a lower real wage in 2016 than they were at the beginning of the expansion in 2010. Changes in wage levels across occupations may also be due to shifts in the occupational mix.

A different database, the U.S. Employment Projections, includes the typical training or education level required for entry into a given occupation, along with any requirements for experience in a related occupation. Combining these statistics with the wage data from the Occupational Employment Statistics allows an exploration of changes in the number of positions by skill and education level – from jobs requiring only brief on-the-job training through doctoral or professional degrees (such as law or medical degrees) – and the average annual wage of the jobs at each level.

[1] Employment and wages are not reported for occupations with few positions, where the estimate would have an especially high margin of error.

It is important to call attention to the difference between the annual wages reported in Table 1 and those in Table 2. Table 1 wages are medians; half of the workers in the occupation earn more than the median and half earn less. Thus, the median can be thought of the wage earned by the typical worker. In contrast, Table 2 wages are means, which are calculated by summing the wages for all workers in an occupation and dividing by the number of workers. This makes a difference if there are relatively few workers earning an unusually high wage – as is often the case. These high wages will have a large impact on the mean but only a minimal impact on the median because a specific high wage counts as only one observation. This implies that mean wages are usually higher than median wages and less representative of the wage of the typical worker. The problem is that while median wages are reported for occupational groups, they cannot be estimated for the occupations in multiple groups that are combined in Table 2; multiple medians cannot be combined to produce a single median. Consequently, the less-desirable mean is the only alternative.

A second point is that the range of occupations included in the 2010 group differs from that in the 2016 group. In order to include an occupation in the analysis, we require both an employment total and an average wage. (The training or education level is available for all occupations.) As noted earlier, these values are not provided if they have especially large margins of error. To assess differences in coverage, we compare the sum of the included occupations to the complete employment total in Table 1. As the last line of Table 2 reveals, the sum of the included observations in the education level analysis in 2010 is 4,890,160, or 99.4 percent of the estimated total employment in Table 1 of 4,921,690. Included employment in Table 2 for 2016 is 99.7 percent. Thus, proportionally less employment is reflected in the 2010 totals than is reflected in 2016 totals. This implies that actual percentage employment changes are generally lower than those given in Table 2 (i.e., positive changes are less positive and negative changes are more negative than those reported). The fact that the two percentages are close implies that the overstatement is not great, and in any case, there is no reason to believe that average wage changes are misstated. However, this point and the one regarding mean wages imply that we should not read too much into the specific values in Table 2, but instead focus on general patterns.

Those patterns suggest that occupations requiring a degree beyond an associate degree saw strong growth, with jobs in the skilled trades requiring a vocational certificate growing even more. Jobs requiring only an associate degree declined more than 10 percent, highlighting the importance of programs at community colleges that provide an easy transition for their graduates to four-year programs. In contrast, growth of jobs with minimal skill requirements – the only jobs available for those without a high school diploma – had essentially no growth. Consistent with the results of the occupational group analysis, 2016 wages were lower than their inflation-adjusted 2010 averages – except for jobs requiring master's and doctoral degrees.

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. Workers with higher levels of education and training and workers with experience are generally more productive than those with less education, so wages of jobs requiring college degrees are higher than those not requiring a degree. Similarly, wages for jobs requiring experience, including previous experience in a similar position or an apprenticeship, pay more. In contrast, the output level generated by the minimally-skilled jobs requiring only short-term on-the-job training paid on average only $26,800 per year. This is below the poverty level for many households and below a living wage for everybody. Recall, however, that the wage of a typical unskilled worker is even less than this mean wage. These workers must cobble together multiple jobs, work more than a 40-hour week, and rely on public and private assistance in order to supply their basic needs.

Occupational Employment and Wages in Ohio's Major Metropolitan Areas

The Occupational Employment Statistics are also available for Metropolitan Statistical Areas (MSAs). This article focuses on Ohio's three largest MSAs, Cincinnati, Cleveland, and Columbus. Smaller MSAs could also be considered, but their smaller employment base would lead to statistics being suppressed for a larger number of occupations and less reliable results.

Cincinnati

Tables 3 and 4 replicate the statewide tables for the Cincinnati MSA, which also includes counties in Kentucky and Indiana. Estimated total employment growth between 2010 and 2016 is 8.2 percent. Although this is only slightly less than the 8.5 percent statewide average, the difference is statistically significant. The growth rate of the higher-level business occupations in the managerial and business operations groups was higher than that of the state, as was the growth of the STEM-related groups. Office and administrative support occupations, however, suffered a 4.9 percent decline, and community and social service, legal, and education occupations also fared worse. Median wage growth across all occupations was flat, a better-than-average performance.

Employment and wage changes across education and training levels are displayed in Table 4. The growth of non-degree jobs was somewhat less than statewide growth, and the growth of degree jobs was somewhat more. While employment growth in the least-skilled jobs was greater than the state, growth in jobs requiring more intensive on-the-job training and experience was less, perhaps suggesting that the upward mobility potential of unskilled workers was less favorable in Cincinnati than elsewhere in the state. The inflation-adjusted decline in wages for non-degree jobs was similar to that at the state level. Wages for jobs requiring a degree declined, however, declined 2.1 percent compared to the zero statewide net change. This was primarily due to a 12 percent decline in wages for jobs requiring a JD, MD, or other professional degree.

Cleveland

Employment and wages in the Cleveland MSA are in Tables 5 and 6. Previous articles have called attention to the relatively weak employment growth in northeast Ohio. That weakness is on display in Table 5 as well, with a net growth between 2010 and 2016 of only 6.1 percent. As elsewhere, higher-level business and STEM occupations experienced growth near or at double-digit rates, with a massive 45 percent growth in jobs in the life, physical, and social sciences. This was offset by weaker-than-average growth in personal care, construction, maintenance, and production occupations. Despite the weak employment growth, the net decline in the region-wide median wage was slightly less than that the state's decline. This could be due to the net population decline in the Cleveland MSA, leading to relatively slow growth in the workforce.

Table 6 reveals that job growth at each education and training level was weaker than that at the state level, except for better-than-average growth in professional degree-requiring occupations. Note, however, that in contrast to the state and the other MSAs, a smaller percentage of total employment is included in the 2016 estimates. This implies that these percentage employment changes are somewhat understated. Wages increased for jobs requiring short-term training. They also increased for those requiring a degree plus experience. Many of these are managerial jobs, and the wage increase is likely driven by the sharp increase in that occupational group. The increases in jobs requiring master's degrees, many of which are in STEM fields, and professional degrees were even larger.

Columbus

Columbus MSA occupational employment and wages are displayed in Tables 7 and 8. As Table 7 shows, total growth was 15.6 percent, significantly faster than average. This too is consistent with the rapid growth shown in industry-based employment statistics. This above-average growth was also evident across most occupational groups, except for a 29 percent decline in healthcare support occupations. Perhaps surprisingly, the region's median wage decreased 3.3 percent, worse than the state average. This could be a function of occupational shifts: there were particularly large increases in the occupational groups in the lower half of Table 7, many of which offer lower pay.

Table 8 bears this possibility out, with high growth in occupations at the lower end of the skill spectrum and growth in all non-degree jobs not much slower than degree job growth. Inflation-adjusted wage declines were particularly severe for jobs requiring short-term on-the-job training, however. This was offset by better-than-average wage changes in the other non-degree categories, producing a 1.6 percent decline in the overall category, equal to the state average. In contrast, the wage growth of jobs requiring degrees was somewhat less than average, except for jobs requiring a degree plus experience or a professional degree.

APPENDIX

Table 1
Ohio Employment and Wages by Occupational Group

Occupational group	Employment		Change, 2010-2016		Annual median wage (2016 dollars)		
	May 2010	May 2016	Number	Percentage	May 2010	May 2016	Pct.chng.
All occupations	**4,921,690**	**5,337,890**	**416,200**	**8.5%**	**$ 36,063**	**$ 35,760**	**-0.8%**
Management	183,760	239,640	55,880	30.4%	98,879	92,650	-6.3%
Business and financial operations	217,470	261,220	43,750	20.1%	63,590	61,700	-3.0%
Computer and mathematical science	119,540	140,110	20,570	17.2%	76,232	75,700	-0.7%
Architecture and engineering	80,770	94,370	13,600	16.8%	72,956	72,650	-0.4%
Life, physical, and social science	29,630	35,490	5,860	19.8%	62,693	58,880	-6.1%
Community and social services	72,360	76,540	4,180	5.8%	43,893	41,530	-5.4%
Legal	29,490	30,740	1,250	4.2%	68,884	66,180	-3.9%
Education, training, and library	303,440	317,620	14,180	4.7%	51,520	49,700	-3.5%
Arts, entertainment, sports, and media	54,620	59,760	5,140	9.4%	41,515	38,840	-6.4%
Healthcare practitioners	324,310	360,860	36,550	11.3%	61,122	59,040	-3.4%
Healthcare support	202,760	199,500	-3,260	-1.6%	25,833	24,640	-4.6%
Protective service	112,710	116,940	4,230	3.8%	41,705	39,060	-6.3%
Food preparation and serving	455,340	506,630	51,290	11.3%	20,224	19,350	-4.3%
Building and grounds cleaning	152,440	160,270	7,830	5.1%	24,094	23,590	-2.1%
Personal care and service	108,180	126,220	18,040	16.7%	22,816	21,510	-5.7%
Sales and related	515,960	509,470	-6,490	-1.3%	25,912	25,540	-1.4%
Office and administrative support	813,290	815,240	1,950	0.2%	33,360	32,790	-1.7%
Farming, fishing, and forestry	4,120	4,180	60	1.5%	27,011	28,170	4.3%
Construction and extraction	153,480	180,550	27,070	17.6%	46,529	45,530	-2.1%
Installation, maintenance & repair	188,650	210,310	21,660	11.5%	43,915	42,580	-3.0%
Production	433,270	494,570	61,300	14.1%	35,805	34,950	-2.4%
Transportation and material moving	366,110	397,650	31,540	8.6%	29,983	29,480	-1.7%

Source: Occupational Employment Statistics, U.S. Bureau of Labor Statistics. May 2010 wages inflated to 2016-equivalent levels using the Consumer Price Index for All Urban Consumers (CPI-U), U.S. Bureau of Labor Statistics.

Table 2
Ohio Employment and Wages by Occupational Skill/Education Level

Training/education requirement	Employment		Change, 2010-2016		Annual mean wage (2016 dollars)		
	May 2010	May 2016	Number	Percentage	May 2010	May 2016	Pct.chng.
Non-degree	**3,622,780**	**3,889,150**	**266,370**	**7.4%**	**$ 34,743**	**$ 34,193**	**-1.6%**
Short-term on-the-job training	1,994,230	2,042,960	48,730	2.4%	27,248	26,823	-1.6%
Moderate-term on-the-job training	774,670	871,570	96,900	12.5%	41,487	41,015	-1.1%
Long-term on-the-job training	194,450	206,870	12,420	6.4%	48,062	47,481	-1.2%
Related work experience	284,010	283,410	-600	-0.2%	52,724	51,277	-2.7%
Postsecondary vocational award	375,420	484,340	108,920	29.0%	40,138	37,333	-7.0%
Degree	**1,267,380**	**1,433,530**	**166,150**	**13.1%**	**77,542**	**77,529**	**0.0%**
Associate degree	137,890	123,250	-14,640	-10.6%	52,451	51,223	-2.3%
Bachelor's degree	689,410	834,780	145,370	21.1%	67,919	67,190	-1.1%
Degree plus experience	243,130	261,370	18,240	7.5%	100,171	101,365	1.2%
Master's degree	77,030	86,660	9,630	12.5%	69,485	72,449	4.3%
Doctoral degree	48,880	48,830	-50	-0.1%	78,444	88,164	12.4%
First professional degree	71,040	78,640	7,600	10.7%	150,290	148,273	-1.3%
Sum of included jobs	**4,890,160**	**5,322,680**					
Percentage of total employment	**99.4%**	**99.7%**					

Source: Derived from data from Occupational Employment Statistics and U.S. Employment Projections, Bureau of Labor Statistics. May 2010 wages inflated to 2016-equivalent levels using the Consumer Price Index for All Urban Consumers (CPI-U), U.S. Bureau of Labor Statistics.

Table 3
Cincinnati MSA Employment and Wages by Occupational Group

Occupational group	Employment		Change, 2010-2016		Annual median wage (2016 dollars)		
	May 2010	May 2016	Number	Percentage	May 2010	May 2016	Pct.chng.
All occupations	**963,290**	**1,042,560**	**79,270**	**8.2%**	**$ 37,162**	**$ 37,200**	**0.1%**
Management	40,360	53,700	13,340	33.1%	104,274	99,510	-4.6%
Business and financial operations	48,270	61,250	12,980	26.9%	63,612	62,470	-1.8%
Computer and mathematical science	26,390	32,170	5,780	21.9%	76,288	76,870	0.8%
Architecture and engineering	15,950	20,000	4,050	25.4%	76,456	76,400	-0.1%
Life, physical, and social science	6,090	8,250	2,160	35.5%	60,202	53,820	-10.6%
Community and social services	12,340	12,380	40	0.3%	42,210	40,680	-3.6%
Legal	6,270	5,980	-290	-4.6%	75,446	77,940	3.3%
Education, training, and library	55,640	57,210	1,570	2.8%	47,987	49,980	4.2%
Arts, entertainment, sports, and media	11,340	12,170	830	7.3%	41,907	41,680	-0.5%
Healthcare practitioners	59,190	66,930	7,740	13.1%	64,083	60,070	-6.3%
Healthcare support	32,240	32,060	-180	-0.6%	28,402	26,920	-5.2%
Protective service	19,950	22,190	2,240	11.2%	38,306	35,330	-7.8%
Food preparation and serving	91,330	101,380	10,050	11.0%	20,516	19,320	-5.8%
Building and grounds cleaning	28,420	30,160	1,740	6.1%	25,620	24,230	-5.4%
Personal care and service	23,060	27,510	4,450	19.3%	22,827	22,110	-3.1%
Sales and related	103,000	102,320	-680	-0.7%	28,839	28,290	-1.9%
Office and administrative support	173,650	165,070	-8,580	-4.9%	34,571	33,850	-2.1%
Farming, fishing, and forestry	n/a	340	n/a	n/a	24,779	24,930	0.6%
Construction and extraction	30,910	34,770	3,860	12.5%	45,979	44,460	-3.3%
Installation, maintenance & repair	35,750	39,710	3,960	11.1%	45,037	44,560	-1.1%
Production	70,490	79,890	9,400	13.3%	36,938	36,090	-2.3%
Transportation and material moving	71,990	77,120	5,130	7.1%	30,107	30,290	0.6%

Source: Occupational Employment Statistics, U.S. Bureau of Labor Statistics. May 2010 wages inflated to 2016-equivalent levels using the Consumer Price Index for All Urban Consumers (CPI-U), U.S. Bureau of Labor Statistics.

Table 4
Cincinnati MSA Employment and Wages by Occupational Skill/Education Level

Training/education requirement	Employment		Change, 2010-2016		Annual mean wage (2016 dollars)		
	May 2010	May 2016	Number	Percentage	May 2010	May 2016	Pct.chng.
Non-degree	**687,750**	**734,860**	**47,110**	**6.8%**	**$ 35,649**	**$ 35,000**	**-1.8%**
Short-term on-the-job training	384,630	399,220	14,590	3.8%	28,000	27,162	-3.0%
Moderate-term on-the-job training	139,200	151,310	12,110	8.7%	43,377	44,090	1.6%
Long-term on-the-job training	37,130	38,100	970	2.6%	48,777	48,015	-1.6%
Related work experience	59,370	56,820	-2,550	-4.3%	53,849	51,774	-3.9%
Postsecondary vocational award	67,420	89,410	21,990	32.6%	40,076	38,409	-4.2%
Degree	**250,740**	**285,880**	**35,140**	**14.0%**	**81,118**	**79,434**	**-2.1%**
Associate degree	25,840	24,580	-1,260	-4.9%	52,186	52,308	0.2%
Bachelor's degree	136,820	166,840	30,020	21.9%	69,076	68,438	-0.9%
Degree plus experience	54,530	58,390	3,860	7.1%	106,964	108,868	1.8%
Master's degree	12,570	13,970	1,400	11.1%	68,751	71,619	4.2%
Doctoral degree	6,320	7,210	890	14.1%	76,373	76,022	-0.5%
First professional degree	14,660	14,890	230	1.6%	161,005	140,977	-12.4%
Sum of included jobs	**938,490**	**1,020,740**					
Percentage of total employment	**97.4%**	**97.9%**					

Source: Derived from data from Occupational Employment Statistics and U.S. Employment Projections, Bureau of Labor Statistics. May 2010 wages inflated to 2016-equivalent levels using the Consumer Price Index for All Urban Consumers (CPI-U), U.S. Bureau of Labor Statistics.

Table 5
Cleveland MSA Employment and Wages by Occupational Group

Occupational group	Employment		Change, 2010-2016		Annual median wage (2016 dollars)		
	May 2010	May 2016	Number	Percentage	May 2010	May 2016	Pct.chng.
All occupations	**968,160**	**1,027,410**	**59,250**	**6.1%**	**$ 38,004**	**$ 37,830**	**-0.5%**
Management	38,650	48,850	10,200	26.4%	101,784	95,420	-6.3%
Business and financial operations	47,250	55,150	7,900	16.7%	64,577	63,450	-1.7%
Computer and mathematical science	22,150	28,390	6,240	28.2%	73,685	71,630	-2.8%
Architecture and engineering	16,620	18,200	1,580	9.5%	74,605	74,440	-0.2%
Life, physical, and social science	5,950	8,640	2,690	45.2%	62,446	66,170	6.0%
Community and social services	12,720	17,110	4,390	34.5%	45,822	47,820	4.4%
Legal	7,620	8,500	880	11.5%	80,337	68,290	-15.0%
Education, training, and library	54,530	58,020	3,490	6.4%	53,562	50,470	-5.8%
Arts, entertainment, sports, and media	11,190	12,460	1,270	11.3%	42,008	40,150	-4.4%
Healthcare practitioners	71,020	75,970	4,950	7.0%	63,422	62,600	-1.3%
Healthcare support	41,410	38,280	-3,130	-7.6%	25,710	25,460	-1.0%
Protective service	29,870	27,230	-2,640	-8.8%	41,301	37,420	-9.4%
Food preparation and serving	84,390	92,410	8,020	9.5%	20,539	19,480	-5.2%
Building and grounds cleaning	30,470	30,730	260	0.9%	24,420	23,180	-5.1%
Personal care and service	23,480	24,830	1,350	5.7%	24,061	22,430	-6.8%
Sales and related	100,880	97,590	-3,290	-3.3%	28,402	28,710	1.1%
Office and administrative support	164,500	162,040	-2,460	-1.5%	34,751	34,360	-1.1%
Farming, fishing, and forestry	400	430	30	7.5%	24,532	25,370	3.4%
Construction and extraction	28,170	30,850	2,680	9.5%	53,236	52,430	-1.5%
Installation, maintenance & repair	35,450	36,620	1,170	3.3%	45,867	44,300	-3.4%
Production	81,300	89,180	7,880	9.7%	36,332	35,010	-3.6%
Transportation and material moving	60,160	65,930	5,770	9.6%	29,523	30,170	2.2%

Source: Occupational Employment Statistics, U.S. Bureau of Labor Statistics. May 2010 wages inflated to 2016-equivalent levels using the Consumer Price Index for All Urban Consumers (CPI-U), U.S. Bureau of Labor Statistics.

Table 6
Cleveland MSA Employment and Wages by Occupational Skill/Education Level

Training/education requirement	Employment		Change, 2010-2016		Annual mean wage (2016 dollars)		
	May 2010	May 2016	Number	Percentage	May 2010	May 2016	Pct.chng.
Non-degree	**691,400**	**712,870**	**21,470**	**3.1%**	**$ 36,313**	**$ 35,477**	**-2.3%**
Short-term on-the-job training	374,840	373,110	-1,730	-0.5%	27,731	28,017	1.0%
Moderate-term on-the-job training	152,420	161,590	9,170	6.0%	44,108	42,320	-4.1%
Long-term on-the-job training	35,420	35,470	50	0.1%	50,740	49,330	-2.8%
Related work experience	54,150	52,570	-1,580	-2.9%	55,501	52,882	-4.7%
Postsecondary vocational award	74,570	90,130	15,560	20.9%	42,730	38,488	-9.9%
Degree	**256,290**	**281,180**	**24,890**	**9.7%**	**79,333**	**79,292**	**-0.1%**
Associate degree	29,060	22,900	-6,160	-21.2%	54,684	54,231	-0.8%
Bachelor's degree	138,830	166,050	27,220	19.6%	70,920	68,971	-2.7%
Degree plus experience	50,500	53,260	2,760	5.5%	102,789	104,805	2.0%
Master's degree	15,560	16,320	760	4.9%	73,294	78,799	7.5%
Doctoral degree	7,440	5,870	-1,570	-21.1%	76,081	66,459	-12.6%
First professional degree	14,900	16,780	1,880	12.6%	134,223	139,624	4.0%
Sum of included jobs	**947,690**	**994,050**					
Percentage of total employment	**97.9%**	**96.8%**					

Source: Derived from data from Occupational Employment Statistics and U.S. Employment Projections, Bureau of Labor Statistics. May 2010 wages inflated to 2016-equivalent levels using the Consumer Price Index for All Urban Consumers (CPI-U), U.S. Bureau of Labor Statistics.

Table 7
Columbus MSA Employment and Wages by Occupational Group

Occupational group	Employment		Change, 2010-2016		Annual median wage (2016 dollars)		
	May 2010	May 2016	Number	Percentage	May 2010	May 2016	Pct.chng.
All occupations	**885,440**	**1,023,480**	**138,040**	**15.6%**	**38,766**	**37,490**	**-3.3%**
Management	36,790	49,840	13,050	35.5%	103,915	97,810	-5.9%
Business and financial operations	53,690	66,650	12,960	24.1%	66,091	63,240	-4.3%
Computer and mathematical science	38,030	43,420	5,390	14.2%	82,883	83,910	1.2%
Architecture and engineering	14,300	18,180	3,880	27.1%	69,860	72,510	3.8%
Life, physical, and social science	7,220	7,740	520	7.2%	62,199	56,010	-10.0%
Community and social services	12,780	13,690	910	7.1%	46,854	41,430	-11.6%
Legal	7,030	6,770	-260	-3.7%	64,330	72,020	12.0%
Education, training, and library	51,830	59,730	7,900	15.2%	54,998	48,220	-12.3%
Arts, entertainment, sports, and media	12,990	13,510	520	4.0%	49,367	45,060	-8.7%
Healthcare practitioners	50,960	63,750	12,790	25.1%	63,534	60,250	-5.2%
Healthcare support	32,670	23,210	-9,460	-29.0%	25,912	22,030	-15.0%
Protective service	20,880	37,140	16,260	77.9%	46,989	44,050	-6.3%
Food preparation and serving	76,930	94,560	17,630	22.9%	20,505	19,790	-3.5%
Building and grounds cleaning	26,040	31,180	5,140	19.7%	23,937	24,760	3.4%
Personal care and service	18,310	24,640	6,330	34.6%	23,971	21,940	-8.5%
Sales and related	88,760	92,800	4,040	4.6%	26,719	25,970	-2.8%
Office and administrative support	164,340	172,430	8,090	4.9%	35,233	34,190	-3.0%
Farming, fishing, and forestry	900	890	-10	-1.1%	25,530	28,540	11.8%
Construction and extraction	23,060	29,120	6,060	26.3%	59,944	57,850	-3.5%
Installation, maintenance & repair	29,520	37,690	8,170	27.7%	45,295	44,010	-2.8%
Production	49,690	56,910	7,220	14.5%	34,762	36,130	3.9%
Transportation and material moving	68,710	80,500	11,790	17.2%	30,174	27,440	-9.1%

Source: Occupational Employment Statistics, U.S. Bureau of Labor Statistics. May 2010 wages inflated to 2016-equivalent levels using the Consumer Price Index for All Urban Consumers (CPI-U), U.S. Bureau of Labor Statistics.

Table 8
Columbus MSA Employment and Wages by Occupational Skill/Education Level

Training/education requirement	Employment		Change, 2010-2016		Annual mean wage (2016 dollars)		
	May 2010	May 2016	Number	Percentage	May 2010	May 2016	Pct.chng.
Non-degree	**599,760**	**698,590**	**98,830**	**16.5%**	**$ 35,536**	**$ 34,973**	**-1.6%**
Short-term on-the-job training	353,410	394,110	40,700	11.5%	28,543	27,094	-5.1%
Moderate-term on-the-job training	109,590	136,460	26,870	24.5%	43,002	44,043	2.4%
Long-term on-the-job training	23,910	30,020	6,110	25.6%	48,527	48,360	-0.3%
Related work experience	51,260	55,730	4,470	8.7%	53,850	53,895	0.1%
Postsecondary vocational award	61,590	82,270	20,680	33.6%	42,093	39,971	-5.0%
Degree	**249,440**	**296,930**	**47,490**	**19.0%**	**80,908**	**80,442**	**-0.6%**
Associate degree	27,960	24,390	-3,570	-12.8%	53,426	51,614	-3.4%
Bachelor's degree	135,310	181,170	45,860	33.9%	71,752	70,323	-2.0%
Degree plus experience	52,540	55,880	3,340	6.4%	104,142	106,745	2.5%
Master's degree	14,100	14,010	-90	-0.6%	72,241	74,727	3.4%
Doctoral degree	6,090	5,860	-230	-3.8%	85,001	84,331	-0.8%
First professional degree	13,440	15,620	2,180	16.2%	146,677	152,381	3.9%
Sum of included jobs	**849,200**	**995,520**					
Percentage of total employment	**95.9%**	**97.3%**					

Source: Derived from data from Occupational Employment Statistics and U.S. Employment Projections, Bureau of Labor Statistics. May 2010 wages inflated to 2016-equivalent levels using the Consumer Price Index for All Urban Consumers (CPI-U), U.S. Bureau of Labor Statistics.