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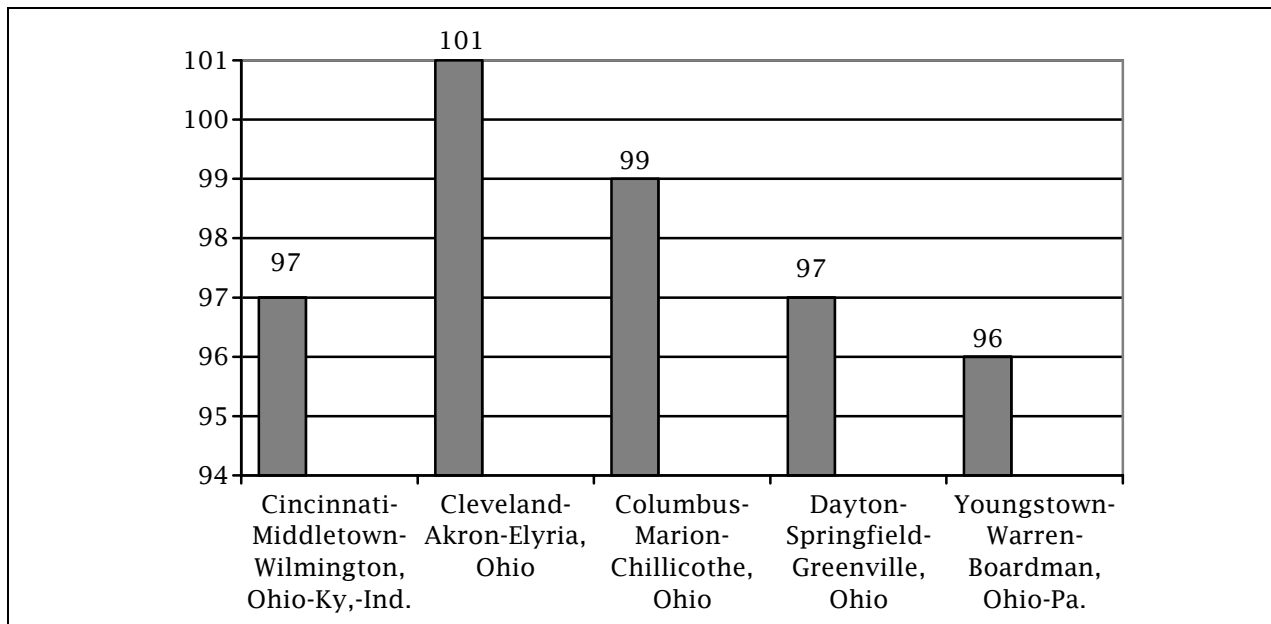
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OCCUPATIONAL PAY RELATIVES FOR METROPOLITAN AREAS IN OHIO, 2007

Average pay across all occupations in both the Cleveland-Akron-Elyria and Columbus-Marion-Chillicothe, Ohio Combined Statistical Areas (CSAs) did not differ significantly from the national average in 2007, according to a recent report from the U.S. Department of Labor's Bureau of Labor Statistics (BLS). However, in three other metropolitan areas in Ohio, average pay was significantly less than that for the nation. Regional Commissioner Jay A. Mousa noted that the Cincinnati-Middletown-Wilmington and Dayton-Springfield-Greenville CSAs had pay relatives of 97, meaning that workers earned 3 percent less than the national average and in the Youngstown-Warren-Boardman Metropolitan Statistical area (MSA), workers earned 4 percent less. (See chart A and table A).

Chart A. Pay relatives for all occupations in metropolitan areas in Ohio, area-to-nation comparisons, National Compensation Survey, July 2007 (U.S. = 100)



BLS produces occupational pay relatives to facilitate comparisons of occupational pay between metropolitan areas and the United States as a whole. Using data from the National Compensation Survey (NCS), pay relatives—a means of assessing relative pay differences—have been prepared for 2007 for each of the 9 major occupational groups within 77 Metropolitan Statistical Areas (MSA), as well as averaged across all occupations for each area.

Area-to-Nation Comparisons

In the Cincinnati area, workers in the management, business, and financial occupational group and the office and administrative support group recorded pay relatives that were significantly lower than the national average. The remaining seven occupational groups did not have pay relatives that were significantly different from the national average.

Table A. Pay relatives for major occupational groups in metropolitan areas in Ohio, area-to-nation comparisons, National Compensation Survey, July 2007

Metropolitan Area ¹	All Occupations	Management, business, and financial	Professional and related	Service	Sales and related
United States	100	100	100	100	100
Cincinnati-Middletown-Wilmington.	97*	93*	99	102	92
Cleveland-Akron-Elyria	101	96	100	101	98
Columbus-Marion-Chillicothe	99	103	95*	101	105
Dayton-Springfield-Greenville	97*	100	94*	96*	97*
Youngstown-Warren-Boardman	96*	99	93*	93*	86*

Metropolitan Area ¹	Office and administrative support	Construction and extraction	Installation, maintenance, and repair	Production	Transportation and material moving
United States	100	100	100	100	100
Cincinnati-Middletown-Wilmington	97*	90	99	100	99
Cleveland-Akron-Elyria	101	102	102	104	105*
Columbus-Marion-Chillicothe	98	99	101	96	98
Dayton-Springfield-Greenville	92*	102	100	106*	102*
Youngstown-Warren-Boardman	92*	95*	94*	101	110*

*The pay relative for this area is significantly different from the national average of all areas at the ten percent level of significance. For additional details, see the Technical Note.

¹ A metropolitan area can be a Metropolitan Statistical Area (MSA) or Combined Statistical Area (CSA) as defined by the Office of Management and Budget, December 2003.

In the Cleveland area, one occupational group--transportation and material moving--had a pay relative that was significantly higher than the national average. None of the other eight occupational groups in Cleveland had pay relatives that differed significantly from that for the nation.

In the Columbus area, the professional and related occupational group recorded a pay relative significantly lower than the national average. No other group registered a pay relative that was significantly different from the U.S. average.

Four occupational groups in the Dayton area had pay relatives that were significantly lower than the national average—professional and related, service, sales and related, and office and administrative support. Two groups had a pay relative that was significantly higher than the national level: transportation and material moving and production.

In the Youngstown area, pay relatives were significantly lower in six occupational groups compared to that for the nation, including sales and related, office and administrative support, and service. Only the transportation and material moving group recorded a significantly higher pay level.

Area-to-Area Comparisons

Area-to-area pay comparisons are useful in determining the differences in pay levels between two metropolitan areas. This type of comparison requires that the base area be changed from the nation to a specific metropolitan area. For example, when Cleveland was the base area (pay relative = 100), average pay for all occupational groups in Youngstown was 5 percent lower than in Cleveland and 3 percent lower in Dayton. (See table 1). When the base area was changed to Youngstown (pay relative = 100), average pay for all occupational groups in Columbus was 4 percent higher and in Dayton, it was 2 percent higher.

Area-to-area comparisons are available on the BLS Web site at www.bls.gov/ncs/ocs/payrel.htm.

Area Definitions:

The Cincinnati-Middletown-Wilmington, Ohio-Ky.-Ind. Combined Statistical Area is comprised Brown, Butler, Clermont, Clinton, Hamilton, and Warren Counties in Ohio; Boone, Bracken, Campbell, Gallatin, Grant, Kenton, and Pendleton Counties in Kentucky; and Dearborn, Franklin, and Ohio Counties in Indiana.

The Cleveland-Akron-Elyria, Ohio Combined Statistical Area is comprised of Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage, and Summit Counties in Ohio.

The Columbus-Marion-Chillicothe, Ohio Combined Statistical Area is comprised of Delaware, Fairfield, Fayette, Franklin, Knox, Licking, Madison, Marion, Morrow, Pickaway, Ross, and Union Counties in Ohio.

The Dayton-Springfield-Greenville, Ohio Combined Statistical Area is comprised of Champaign, Clark, Darke, Greene, Miami, Montgomery, and Preble Counties in Ohio.

The Youngstown-Warren-Boardman, Ohio-Pa. Metropolitan Statistical Area is comprised of Mahoning and Trumbull Counties in Ohio and Mercer County in Pennsylvania.

What is a pay relative?

A pay relative is a calculation of pay—wages, salaries, commissions, and production bonuses—for a given metropolitan area relative to the nation as a whole. The calculation controls for differences among areas in occupational composition, establishment and occupational characteristics, and the fact that data are collected for areas at different times during the year.

Metropolitan areas often differ greatly in the composition of establishments and occupations that are available to the local workforce. For example, in Brownsville, Texas, the ratio of workers in the high-paying management, business, and financial occupational group to the number of workers in all occupations is under 6 percent, whereas nationally this ratio is over 9 percent.¹ In addition to these factors, the NCS collects compensation data for metropolitan areas at different times during the year. Payroll reference dates differ between areas which makes direct comparisons between areas difficult.

The pay relative approach controls for these differences to isolate the geographic effect on wage determination. To illustrate the importance of controlling for these effects, consider the following example.

The average pay for construction and extraction workers in the New York-Newark-Bridgeport, N.Y.-N.J.-Conn.-Pa. area is \$30.42 and the average pay for construction and extraction workers in the entire United States is \$20.14². A simple pay comparison can be calculated from the ratio of the two average pay levels, multiplied by 100 to express the comparison as a percentage. The pay comparison in the example is calculated as:

$$(\$30.42 \div \$20.14) * 100 \cong 151$$

This comparison does not control for differences between the New York-Newark-Bridgeport area and the nation in the mix of occupations, industries, and other factors. A more accurate estimate of the geographic effect of wages can be obtained by taking these differences into account. Controlling for differences in occupational composition, establishment and occupational characteristics, and the payroll reference date relative to the nation as the whole, the pay relative for construction and extraction occupations in New York-Newark-Bridgeport, N.Y.-N.J.-Conn.-Pa. is equal to 133.

¹ Data for this example are based on the May 2007 Metropolitan and Nonmetropolitan Area Occupational Employment and Wage Estimates, www.bls.gov/oes/current/oessrcma.htm.

² Average pay for construction and extraction workers in the New York-Newark-Bridgeport, N.Y.-N.J.-Conn.-Pa. metropolitan area and for the United States are based on wage estimates published in the New York-Newark-Bridgeport, N.Y.-N.J.-Conn.-Pa., National Compensation Survey, May 2007 and the upcoming National Compensation Survey: Occupational Wages in the United States, July 2007, www.bls.gov/ncs/ncswage2007.htm.

Using pay relative data

To assist data users with the use of these data, tests have been conducted to determine whether differences between each pay relative and the pay relative for the nation as a whole are statistically significant (that is, the pay for the given occupation in that area is too different from the national average to be accounted for by the randomness of the survey's sample). Similar tests are conducted for the area-to-area comparisons. In all tables, statistically significant pay relatives are denoted with an asterisk (*). More information on significance testing is available in the Technical Note.

Also because of sample variation from year to year, data users are cautioned about inferring that there have been actual changes in underlying economic conditions from changes in the estimated pay relatives between 2006 and 2007. This caution applies even more strongly to estimates by occupational group.

Technical Note

Because the NCS is a sample survey, data are subject to sampling error. For the data presented here, sampling errors are differences that occur between the pay relatives estimated from the sample and the true pay relatives derived from the population. It is important to assess whether differences between each pay relative and the pay relative for the nation as a whole is likely to be a result of sampling error or of true differences in pay levels. To perform this assessment, a test of statistical significance is conducted.

The test constructs a 90-percent confidence interval that assumes the given area's true pay relative is equal to the national average. The confidence interval is constructed so that there is a 90 percent probability the pay relative calculated from any one sample is contained within the confidence interval. If from a single sample a calculated pay relative falls within the confidence interval, then the pay relative is not statistically significant and the hypothesis that the true pay relative is equal to the national average is accepted. However, if the pay relative falls outside of the constructed confidence interval then the pay relative is statistically significant at the 10-percent level. The hypothesis that the given area's pay relative is equal to the pay relative for the nation is rejected and one can conclude with reasonable confidence that the true pay relative is different from the national average.

In addition to sampling error, pay relatives are subject to a variety of sources that can adversely influence the estimates. The NCS may be unable to obtain information for some establishments; there may be difficulties with survey definitions; respondents may be unable to provide correct information, or mistakes in recording or coding the data may occur. Non-sampling errors of these kinds were not specifically measured. However, they are expected to be minimal due to the extensive training of the field economists who gathered the survey data, computer edits of the data, and detailed data review.

Historical pay relative data are available for 1992-1996, 1998, 2002, 2004-2006. There are several differences between the recent pay relatives and the pay relatives for earlier years, including different industry and occupation classification systems, varying methodology, and different survey designs. These differences limit comparability. The pay relatives for 2004 through 2007 were calculated using the same industry and occupation classification systems, methodology, and survey design. Nonetheless, comparisons between the estimates for the two years should be made only with a high degree of caution.

Pay relatives were estimated using a multivariate regression technique methodology to control for interarea differences. This technique controls for the following ten characteristics:

- Occupational type
- Industry type
- Work level
- Full-time / part-time status
- Time / incentive status

- Union / nonunion status
- Ownership type
- Profit / non-profit status
- Establishment employment
- Payroll reference date

Even accounting for the characteristics used in the current regression analysis, there is still significant wage variation across the areas. The variation is due to differences in wage determinants that were not included in the model. Examples of these determinants include price levels, environmental amenities such as a pleasant climate, and cultural amenities.

The pay relative regression methodology introduces another type of error. Regression models are subject to specification error. The significance test does not specifically measure specification error. However, care was taken to minimize this form of error by an extensive search across specifications for the model that performs best in terms of predictive accuracy.

For more details, see Maury B. Gittleman, "Pay Relatives for Metropolitan Areas in the U.S." *Monthly Labor Review*, March 2005, pp. 46-53, and Parastou Karen Shahpoori, "Pay Relatives for Major Metropolitan Areas," *Compensation and Working Conditions*, Spring 2003.

Table 1. Pay relatives for major occupational groups in metropolitan areas in Ohio, area-to-area comparisons, National Compensation Survey, July 2007

Base Area (Pay relative = 100)	Metropolitan area ¹	All Occupations	Management, business, and financial	Professional and related	Service	Sales and related	Office and administrative support	Construction and extraction	Installation, maintenance, and repair	Produc- tion	Transpor- tation and material moving
Cincinnati- Middletown- Wilmington	Cleveland-Akron-Elyria	104*	103	101	99	107	104*	113	103	104	106
	Columbus-Marion-Chillicothe	103	111*	96	99	114	102	110	101	96	99
	Dayton-Springfield-Greenville	100	108*	95*	94*	105	95*	113	100	106*	103
	Youngstown-Warren-Boardman	98	107	94*	91*	94	95*	106	95	101	111*
Cleveland- Akron-Elyria	Cincinnati-Middletown- Wilmington	96*	97	99	101	94	96*	88	98	96	94
	Columbus-Marion-Chillicothe	99	108	95	100	107	97	97	99	93	94
	Dayton-Springfield-Greenville	97*	105	94*	94*	99	91*	99	98	102	97
	Youngstown-Warren-Boardman	95*	104	94*	92*	88*	91*	93	92	97	105
Columbus- Marion- Chillicothe	Cincinnati-Middletown- Wilmington.	98	90*	105	101	88	98	91	99	104	101
	Cleveland-Akron-Elyria	101	93	105	100	93	103	103	101	108	107
	Dayton-Springfield-Greenville	98*	97	99	94*	92	93*	103	99	110*	104
	Youngstown-Warren-Boardman.	96*	96	99	92*	82*	94*	96	93	105	112*
Dayton- Springfield- Greenville	Cincinnati-Middletown- Wilmington	100	93*	106*	107*	95	106*	89	100	94*	97
	Cleveland-Akron-Elyria	103*	96	106*	106*	101	110*	101	102	98	103
	Columbus-Marion-Chillicothe	102*	103	101	106*	108	107*	97	101	91*	96
	Youngstown-Warren-Boardman	98*	99	100	97*	89*	101	94*	94*	95*	108*
Youngstown- Warren- Boardman	Cincinnati-Middletown- Wilmington	102	93	106*	110*	106	105*	95	106	99	90*
	Cleveland-Akron-Elyria	105*	96	107*	109*	114*	110*	107	108	103	96
	Columbus-Marion-Chillicothe	104*	104	101	109*	121*	107*	104	107	95	89*
	Dayton-Springfield-Greenville	102*	101	100	103*	112*	99	107*	106*	105*	93*

* The pay relative for this area is significantly different from the average in the metropolitan area at the ten percent level of significance. For additional details, see the Technical Note at www.bls.gov/news.release/ncspay.tn.htm.

¹ A metropolitan area can be a Metropolitan Statistical Area (MSA) or Combined Statistical Area (CSA) as defined by the Office of Management and Budget, December 2003.