

# News

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## **NEW ENGLAND OCCUPATIONAL PAY COMPARISONS, 2007**

Pay relatives averaged across all occupations were significantly different from the national average in the four New England metropolitan areas in 2007: Boston-Worcester-Manchester, Mass.-N.H.; Hartford-West Hartford-Willimantic, Conn.; Providence-New Bedford-Fall River, R.I.-Mass.; and Springfield, Mass. Workers in the Hartford area had an overall pay relative of 113, meaning that pay on average was 13 percent higher than the nation as a whole. In the Boston area, workers had a pay relative of 112, or earned 12 percent above the national average. The Springfield and Providence areas posted pay relatives of 110 and 109, respectively. Among the 77 metropolitan areas for which pay relative data were available, all four of the New England areas ranked in the top ten highest paid.

The Bureau of Labor Statistics (BLS) of the U.S. Department of Labor produces occupational “pay relatives” to facilitate comparisons of pay differences between metropolitan areas and the United States as a whole. Using data from the National Compensation Survey (NCS), pay relatives have been prepared for the 9 major occupational groups within 77 Metropolitan Statistical Areas, as well as averaged across all occupations for each area.

### **Area to Nation Comparisons**

Workers in the Boston area earned significantly higher pay than the nation as a whole in all nine occupational groups. Pay relatives in the Boston area ranged from 125 for construction and extraction occupations to 106 for sales and related occupations. Pay in installation, maintenance, and repair occupations was 15 percent above the national average, the highest in the nation for this occupational group. (Along with Boston, Sacramento-Arden-Arcade-Truckee, Calif.-Nev., also had a pay relative of 115 for this group.) Among office and administrative support workers in the Boston area, pay was also 15 percent above the national average, second highest in the nation, a ranking it shared with the New York-Newark-Bridgeport, N.Y.-N.J.-Conn.-Pa. area.

Workers in the Hartford area had earnings that were significantly above the national average in six of the nine occupational groups. (The exceptions were sales and related occupations; construction and extraction occupations; and installation, maintenance, and repair occupations.) Pay relatives ranged from 121 for service workers to 108 for transportation and material moving workers. Pay in service occupations in Hartford was 21 percent above the national average, second highest in the nation among the 77 metropolitan areas surveyed.

Workers in the Providence area had earnings that were significantly above the national average in eight of the nine occupational groups, the exception being sales and related occupations. Pay relatives ranged from 116 for service workers to 106 for both management, business, and financial workers and transportation and material moving workers.

**Table A. Pay relatives for major occupational groups in New England metropolitan areas, National Compensation Survey, July 2007** (Average pay for all occupations nationally = 100. Average pay nationally for each occupational group shown = 100.)

New England Metropolitan Area <sup>1</sup>	All occupations	Management, business, and financial	Professional and related	Service	Sales and related
<b>United States</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
Boston-Worcester-Manchester, Mass.-N.H.	112*	108*	109*	114*	106*
Hartford-West Hartford-Willimantic, Conn.	113*	111*	109*	121*	107
Providence-New Bedford-Fall River, R.I.-Mass.	109*	106*	113*	116*	102
Springfield, Mass.	110*	101	112*	107*	110*
New England Metropolitan Area <sup>1</sup>	Office and administrative support	Construction and extraction	Installation, maintenance, and repair	Production	Transportation and material moving
<b>United States</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
Boston-Worcester-Manchester, Mass.-N.H.	115*	125*	115*	108*	111*
Hartford-West Hartford-Willimantic, Conn.	112*	115	111	112*	108*
Providence-New Bedford-Fall River, R.I.-Mass.	107*	113*	111*	111*	106*
Springfield, Mass.	110*	109*	103	109*	113*

\* The pay relative for this area is significantly different from the national average of all areas at the 10% level of significance. For additional details, see the Technical note.

<sup>1</sup> 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.

Workers in the Springfield area earned significantly higher pay than the nation in seven of the nine occupational groups. Pay relatives in the Springfield area ranged from 113 for transportation and material moving occupations to 107 for service occupations. Pay in transportation and material moving occupations was 13 percent higher than that for the nation, placing Springfield at the top of the national ranking for this occupational group.

### Area to Area Pay Comparisons

Similar area-to-area comparisons have been calculated for all 77 areas and are available on the BLS website at [www.bls.gov/ncs/ocs/payrel.htm](http://www.bls.gov/ncs/ocs/payrel.htm).

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, table 1 illustrates the pay relatives for metropolitan areas in New England when Boston was the base area (pay relative=100). The pay in Springfield was 2 percent lower than in Boston, and in Providence, was 3 percent lower. Tables 2 through 4 recalculate the pay differentials using the other three metropolitan areas in New England as the base areas.

### Area Definitions

The Boston-Worcester-Manchester, Mass.-N.H., Combined Statistical Area is comprised of Essex, Middlesex, Norfolk, Plymouth, Worcester, and Suffolk Counties, Mass.; Rockingham, Merrimack, Belknap, Hillsborough, and Strafford Counties, N.H.

The Springfield, Mass, Metropolitan Statistical Area includes Franklin, Hampden, and Hampshire Counties, Mass.

The Providence-New Bedford-Fall River, R.I.-Mass., Metropolitan Statistical Area includes Bristol, Kent, Newport, Providence, and Washington Counties, R.I.; and Bristol County, Mass.

The Hartford-West Hartford-Willimantic, Conn., Combined Statistical Area is comprised of Hartford, Middlesex, Windham, and Tolland Counties, Conn.

### **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 differ greatly in the types of occupations that are available to the local workforce. For example, in Brownsville-Harlingen, Texas, the ratio of workers in the typically high-paying management, business, and financial occupations group to the number of workers in all occupations is under 6 percent, whereas nationally this ratio is nearly 9 percent.<sup>1</sup> 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, NY-NJ-CT-PA area is \$30.42 and the average pay for construction and extraction workers in the entire United States is \$20.14.<sup>2</sup> 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, NY-NJ-CT-PA metropolitan 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, NY-NJ-CT-PA is equal to 133.

### **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 in significance testing is available in the Technical Note.

Yearly differences in area and occupational group differences in pay relatives do not infer changes in underlying economic conditions.

**Table 1. Pay relatives for major occupational groups in New England metropolitan areas, National Compensation Survey, July 2007**

(Average pay for all occupations and for each occupational group shown in the Boston-Worcester-Manchester, Mass.-N.H. metropolitan area = 100.)

New England Metropolitan Area <sup>1</sup>	All occupations	Management, business, and financial	Professional and related	Service	Sales and related	Office and administrative support	Construction and extraction	Installation, maintenance, and repair	Production	Transportation and material moving
Boston-Worcester-Manchester, Mass.-N.H.	100	100	100	100	100	100	100	100	100	100
Hartford-West Hartford-Willimantic, Conn.	100	103	100	106*	101	98	92	97	104	97
Providence-New Bedford-Fall River, R.I.-Mass.	97*	98	104	102	96	93*	91*	97	102	95*
Springfield, Mass.	98*	93*	103	94*	103	96*	88*	90	101	101

\* The pay relative for this area is significantly different from the average in the Boston-Worcester-Manchester, MA-NH metropolitan area at the 10% level of significance. For additional details, see the Technical Note.

<sup>1</sup> 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.**Table 2. Pay relatives for major occupational groups in New England metropolitan areas, National Compensation Survey, July 2007**

(Average pay for all occupations and for each occupational group shown in the Hartford-West Hartford-Willimantic, Conn. metropolitan area = 100.)

New England Metropolitan Area <sup>1</sup>	All occupations	Management, business, and financial	Professional and related	Service	Sales and related	Office and administrative support	Construction and extraction	Installation, maintenance, and repair	Production	Transportation and material moving
Hartford-West Hartford-Willimantic, Conn.	100	100	100	100	100	100	100	100	100	100
Boston-Worcester-Manchester, Mass.-N.H.	100	97	100	94*	99	102	108	103	96	104
Providence-Fall River-Warwick, R.I.-Mass.	97*	96	104	96*	95	95*	98	100	99	98
Springfield, Mass.	98	91*	103	88*	102	98	95	93	97	105

\* The pay relative for this area is significantly different from the average in the Hartford-West Hartford-Willimantic, CT metropolitan area at the 10% level of significance. For additional details, see the Technical Note.

<sup>1</sup> 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.

**Table 3. Pay relatives for major occupational groups in New England metropolitan areas, National Compensation Survey, July 2007**

(Average pay for all occupations and for each occupational group shown in the Providence-New Bedford-Fall River, R.I.-Mass. metropolitan area = 100.)

New England Metropolitan Area <sup>1</sup>	All occupations	Management, business, and financial	Professional and related	Service	Sales and related	Office and administrative support	Construction and extraction	Installation, maintenance, and repair	Production	Transportation and material moving
Providence-New Bedford-Fall River, R.I.-Mass.	100	100	100	100	100	100	100	100	100	100
Boston-Worcester-Manchester, Mass.-N.H.	103*	102	97	98	104	108*	110*	104	98	105*
Hartford-West Hartford-Willimantic, Conn.	103*	105	96	105*	105	105*	102	100	101	102
Springfield, Mass.	101	95*	100	92*	108*	103*	97	93	98	107*

\* The pay relative for this area is significantly different from the average in the Providence-New Bedford-Fall River, RI-MA metropolitan area at the 10% level of significance. For additional details, see the Technical Note.

<sup>1</sup> 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.**Table 4. Pay relatives for major occupational groups in New England metropolitan areas, National Compensation Survey, July 2007**

(Average pay for all occupations and for each occupational group shown in the Springfield, Mass. metropolitan area = 100.)

New England Metropolitan Area <sup>1</sup>	All occupations	Management, business, and financial	Professional and related	Service	Sales and related	Office and administrative support	Construction and extraction	Installation, maintenance, and repair	Production	Transportation and material moving
Springfield, Mass.	100	100	100	100	100	100	100	100	100	100
Boston-Worcester-Manchester, Mass.-N.H.	102*	107*	97	106*	97	104*	114*	111	99	99
Hartford-West Hartford-Willimantic, Conn.	102	110*	97	113*	98	102	105	108	103	95
Providence-New Bedford-Fall River, R.I.-Mass.	99	105*	100	108*	93*	97*	103	107	102	94*

\* The pay relative for this area is significantly different from the average in the Springfield, MA metropolitan area at the 10% level of significance. For additional details, see the Technical Note.

<sup>1</sup> 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.

## Technical Note

Because the NCS is a sample survey, data are subject to sampling error. For the data presented here, sampling error 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 the 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, and 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.

### **Obtaining information**

Articles, bulletins, and other information may be obtained by calling (617) 565-2327, sending email to [BLInfoBoston@bls.gov](mailto:BLInfoBoston@bls.gov), or visiting the Internet site [www.bls.gov/ro1/home.htm](http://www.bls.gov/ro1/home.htm). Information in this release will be made available to sensory impaired individuals upon request. Voice phone: (617) 565-2072; Federal Relay Service Number: 1-800-877-8339.