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OCCUPATIONAL PAY COMPARISONS AMONG METROPOLITAN AREAS, 2006

Average pay in the San Francisco metropolitan area was 19 percent above the national average in 2006, the highest among the 78 metropolitan areas studied by the National Compensation Survey (NCS), the Bureau of Labor Statistics of the U.S. Department of Labor reported today. In contrast, pay was lowest in the Brownsville, Texas metropolitan area with a pay relative of 78, meaning Brownsville workers earned an average of 78 cents for every dollar earned by workers nationwide. Using data from the NCS, pay relatives—a means of assessing pay differences—are available for each of the 9 major occupational groups within 78 metropolitan areas, as well as averaged across all occupations for each area. (See table 1.) Table A below lists the five highest and five lowest paying metropolitan areas among those studied in the NCS. In addition, similar area-to-area comparisons have been calculated for all 78 areas and will soon be available on the BLS website at http://www.bls.gov/ncs/ocs/payrel.htm.

Table A. Highest and lowest metropolitan area pay relative rankings (of 78 metropolitan areas surveyed)

Rank	Metropolitan Area	Pay Relative
1.	San Francisco-Oakland-San Jose, CA	119
2.	New York-Northern New Jersey-Long Island, NY-NJ-CT-PA	114
3.	Salinas, CA	113
4.	Boston-Worcester-Lawrence, MA-NH-ME-CT	112
	Hartford, CT	112
74.	Corpus Christi, TX	87
	Great Falls, MT	87
	Johnstown, PA	87
	Springfield, MO	87
78.	Brownsville-Harlingen-San Benito, TX	78

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. Simple pay comparisons calculating the ratio of the average pay for an area versus the entire United States in percentage terms would not control for interarea differences in

occupational composition and other factors, which may have a significant effect on pay relatives. More information on pay relative controls and calculations are available in the Technical Note.

The pay relative in 2006 for workers in construction and extraction occupations in the San Francisco area was 122, meaning the pay in San Francisco for that occupational group averaged 22 percent more than the national average pay for that occupational group. By contrast, the pay relative for workers in construction and extraction occupations in the Brownsville, Texas area was 67, meaning pay for workers in those occupations averaged 33 percent less than the national average. Pay relatives calculated for all occupations were significantly different from the national average in 68 of the 78 areas.

The National Compensation Survey (NCS), introduced in 1997, collects earnings and other data on employee compensation covering over 800 detailed occupations in 152 metropolitan and nonmetropolitan areas. Average occupational earnings from the NCS are published annually for 78 metropolitan areas and for the United States as a whole. Beginning in 2006, the NCS implemented a number of significant survey changes including imputing for temporary non-response situations and benchmarking estimated employment. For more details on these changes, see the article at http://www.bls.gov/opub/cwc/cm20070122ar01p1.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 Table 1, statistically significant pay relatives are denoted with an asterisk (*). More information on significance testing is available in the Technical Note.

Data users are cautioned not to use yearly differences in area and occupational pay group differences in pay relatives to infer changes in underlying economic conditions.

Table 1. **Pay relatives for major occupational groups in metropolitan areas, National Compensation Survey, June 2006**

(Average pay nationally for all occupations and for each occupational group shown = 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	Production	Transportation and material moving
United States	100	100	100	100	100	100	100	100	100	100
Amarillo, TX	88*	93*	85*	87*	90*	87*	83*	81*	89*	92*
Anchorage, AK	109*	104	100	121*	108*	106*	125*	111*	115*	110*
Atlanta, GA	102	102	102	97	97	104*	93	102	103	107
Augusta-Aiken, GA-SC	94*	89*	100	89*	83*	96*	95*	97*	98	96*
Austin-San Marcos, TX	95*	91*	95*	93*	100	97*	88*	100	94*	91*
Birmingham, AL	94*	92*	95*	101	94*	96*	84*	99	87*	98
Bloomington, IN	90*	89*	97*	90*	78*	88*	78*	85*	97*	104*
Boston-Worcester-Lawrence, MA-NH-ME-CT ..	112*	110*	108*	113*	106*	113*	124*	115*	108*	111*
Brownsville-Harlingen-San Benito, TX	78*	73*	95*	76*	75*	77*	67*	78*	76*	76*
Buffalo-Niagara Falls, NY	100	91*	91*	106*	105*	99*	111*	100	111*	101
Charleston-North Charleston, SC	93*	98*	94*	86*	101	93*	80*	82*	101	104*
Charlotte-Gastonia-Rock Hill, NC-SC	101	99	93*	98	109*	102	92*	98	104	99
Chicago-Gary-Kenosha, IL-IN-WI	108*	104*	107*	107*	106*	109*	125*	114*	104*	106*
Cincinnati-Hamilton, OH-KY-IN	98*	93*	99	103	94	98	90	98	100	99
Cleveland-Akron, OH	100	96	101	98	95	101	101	102	105*	106*
Columbus, OH	100	100	92*	100	105	99	98	100	96	101
Corpus Christi, TX	87*	92*	94*	83*	88*	84*	92*	81*	89*	86*
Dallas-Fort Worth, TX	98*	100	101	96*	103	99	90*	95*	91*	99
Dayton-Springfield, OH	98*	99*	92*	96*	97*	92*	100	106*	107*	105*
Denver-Boulder-Greeley, CO	102	99	102	99	104	102	91	105	103	98
Detroit-Ann Arbor-Flint, MI	106*	97	104*	101	101	105*	110	97	118*	108*
Elkhart-Goshen, IN	96*	96*	94*	96*	95*	92*	109*	92*	98	101
Fort Collins-Loveland, CO	100	94*	95*	94*	106*	101*	99	104*	95*	111*
Grand Rapids-Muskegon-Holland, MI	101*	93*	97*	104*	109*	100	106*	96*	102*	101
Great Falls, MT	87*	85*	76*	94*	88*	80*	118*	100	96*	92*
Greensboro-Winston Salem-High Point, NC	95*	91*	94*	95*	86*	97*	91*	98	101	104*
Greenville-Spartanburg-Anderson, SC	94*	95*	90*	97*	91*	93*	82*	84*	105*	95*
Hartford, CT	112*	108*	108*	119*	108*	112*	114	108	111*	107*
Hickory-Morganton-Lenoir, NC	95*	89*	89*	90*	91*	95*	98	91*	100	102
Honolulu, HI	105*	105	104	110*	105	99	113*	115*	106	104
Houston-Galveston-Brazoria, TX	96*	100	98	87*	95	98	91*	95	100	95
Huntsville, AL	96*	94	96*	95*	100	96*	91*	90*	100	93*
Indianapolis, IN	97*	82*	97	97	95	98	93*	95	108*	99
Iowa City, IA	98*	95*	95*	102*	92*	101	101	102	101	96*
Johnstown, PA	87*	86*	91*	89*	86*	84*	96*	88*	84*	82*
Kansas City, MO-KS	99	93*	95*	95*	96	100	108	104	104	97
Knoxville, TN	92*	103*	98*	84*	98*	95*	85*	87*	89*	96*
Lincoln, NE	89*	85*	88*	91*	85*	87*	85*	93*	91*	91*
Los Angeles-Riverside-Orange County, CA	107*	106*	109*	109*	115*	106*	110*	106*	99	102
Louisville, KY-IN	96*	91*	96*	103*	99	98*	110*	94*	99	94*
Melbourne-Titusville-Palm Bay, FL	93*	85*	81*	101	96*	89*	92*	101	105*	103*
Memphis, TN-AR-MS	95*	96*	92*	91*	104*	98*	94*	98	97*	96*

See footnotes at end of table.

Table 1. **Pay relatives for major occupational groups in metropolitan areas, National Compensation Survey, June 2006 — Continued**

(Average pay nationally for all occupations and for each occupational group shown = 100.)

Metropolitan Area1	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
Miami-Fort Lauderdale, FL	96*	107*	95*	96*	95*	96	91*	93*	97	98
Milwaukee-Racine, WI	102*	100	97	100	102	104*	110*	101	106*	107*
Minneapolis-St. Paul, MN-WI	108*	101	104*	118*	109*	103*	113*	107	117*	107*
Mobile, AL	88*	81*	85*	84*	95*	90*	94*	98	96*	91*
New Orleans, LA	95*	90*	96*	91*	101	96*	90*	91*	95*	100
New York-Northern New Jersey- Long Island, NY-NJ-CT-PA	114*	114*	116*	114*	112*	114*	128*	114*	105*	110*
Norfolk-VA Beach-Newport News, VA-NC	91*	87*	90*	95*	94*	91*	87*	94*	93*	89*
Ocala, FL	90*	88*	88*	92*	93*	88*	83*	106*	95*	103*
Oklahoma City, OK	91*	87*	85*	91*	93*	89*	101	108*	89*	87*
Orlando, FL	93*	94	88*	94	101	90*	91*	93	85	106
Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD	105*	106*	107*	105*	100	106*	106*	112*	100	108*
Phoenix-Mesa, AZ	97*	99	101	96*	107	101	82*	100	96	100
Pittsburgh, PA	96*	91*	97	98	89*	97*	96	96	99	96
Portland-Salem, OR-WA	104*	104	95*	112*	110*	105	114*	110*	101	100
Providence-Fall River-Warwick, RI-MA	108*	109*	111*	112*	103*	106*	104*	108*	112*	105*
Reading, PA	102*	105*	94*	101	106*	102*	102	100	99	102*
Reno, NV	98*	97*	95*	99	101	99	96*	111*	98	101
Richland-Kennewick-Pasco, WA	103*	96	95*	113*	105*	100	111*	93*	98	100
Richmond-Petersburg, VA	98*	98*	95*	98*	99	99*	92*	99	102*	100
Rochester, NY	97*	89*	97*	104*	96*	98*	94*	89*	100	100
Rockford, IL	100	90*	97*	99*	100	97*	111*	104*	103*	104*
Sacramento-Yolo, CA	106*	102	107*	111*	102	104*	103	118*	111*	108*
Salinas, CA	113*	115*	121*	115*	129*	111*	132*	110*	95*	104*
San Antonio, TX	89*	93*	91*	87*	84*	91*	97*	97*	96*	86*
San Diego, CA	108*	106*	110*	112*	106	105*	107	107*	104	101
San Francisco-Oakland-San Jose, CA	119*	114*	117*	123*	124*	122*	122*	117*	108*	108*
Seattle-Tacoma-Bremerton, WA	109*	103	99	119*	111*	108*	111*	106*	117*	113*
Springfield, MA	109*	104*	109*	105*	113*	110*	105*	110*	108*	115*
Springfield, MO	87*	82*	88*	84*	91*	86*	77*	91*	94*	89*
St. Louis, MO-IL	101	97	99	94*	100	99	117*	107	104	108
Tallahassee, FL	91*	81*	90*	96*	92*	91*	88*	87*	95*	93*
Tampa-St. Petersburg-Clearwater, FL	95*	89*	91*	95*	98	100	97	94	93*	103
Visalia-Tulare-Porterville, CA	99*	101	98*	101	102	97*	92*	93*	105*	97*
Washington-Baltimore, DC-MD-VA-WV	107*	103	107*	106*	106*	111*	100	116*	108*	106*
York, PA	97*	102	98*	98*	91*	95*	102	99	96*	103*
Youngstown-Warren, OH	96*	96*	93*	91*	92*	92*	99	95*	102*	110*

* The pay relative for this area is significantly different from the national average of all areas at the 10 percent level of significance. For additional details, see the Technical Note.
1 A metropolitan area can be a Metropolitan Statistical Area (MSA) or Consolidated Metropolitan Statistical Area (CMSA) as defined by the Office of Management and Budget, 1994.

Technical Note

Pay relative controls and calculations

Pay relatives control for differences among areas in occupational composition as well as establishment and occupational characteristics. 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 8 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 professional and related workers in San Francisco is $37.57 and the average pay for professional and related workers in the entire United States is $29.76.[2] 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:

$$(\$37.57 \div \$29.76) * 100 \cong 126$$

This comparison does not control for differences between San Francisco and the nation in the mix of occupations, industries, and other factors. A more accurate estimate of the geographic effect of wages in San Francisco can be obtained by taking these differences into account. Controlling for differences in occupational composition, establishment and occupational characteristics, and the payroll reference date in San Francisco relative to the nation as the whole, the pay relative for professional and related occupations in San Francisco is equal to 117.

Sampling errors and statistical significance

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, 2004, and 2005. 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, 2005, and 2006 were calculated using the same industry and occupation classification systems, methodology, and survey design. Nonetheless, comparisons between the estimates for these 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.

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[1] Data for this example are based on the May 2006 Occupational Employment and Wage Estimates, http://www.bls.gov/oes/current/oessrcma.htm.
[2] Average pay for professional workers in San Francisco and for the United States are based on wage estimates published in the San Francisco–Oakland–San Jose, CA National Compensation Survey, March 2006 and the National Compensation Survey: Occupational Wages in the United States, June 2006, http://www.bls.gov/ncs/ocs/compub.htm.