

April 2011

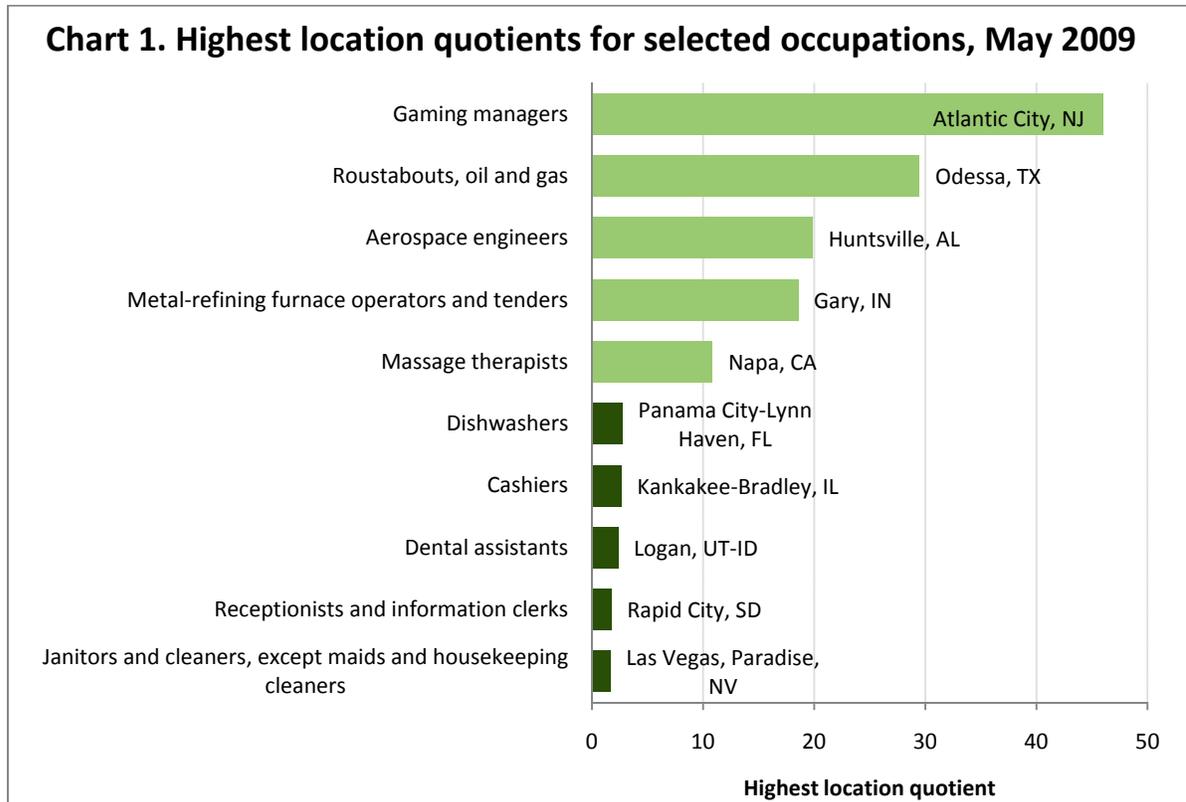
Occupational Employment Statistics (OES) Highlights



Using Location Quotients to Analyze Occupational Data

Montana employed bartenders at 3 times the national rate in May 2009, Delaware employed chemists at nearly 8 times the national rate, fast food cooks were 3 times as concentrated in Mississippi as in other parts of the country, and computer software engineers were more than twice as prevalent in Virginia as elsewhere.

These comparisons are easily made through the use of location quotients.



Some familiar and some not-so-familiar patterns emerge when looking at location quotient data. For example, the areas with the highest location quotients for several gaming occupations included Atlantic City and several areas in Nevada. Atlantic City and Las Vegas also had among the highest concentrations of bartenders, as did areas in the northern states of Montana, Wisconsin, North Dakota, and Minnesota. Areas that tend to be tourist destinations had higher location quotients for leisure-related occupations, such as high concentrations of restaurant cooks in Nantucket and Martha's Vineyard and massage therapists in Napa, CA. Palm Bay-Melbourne-Titusville, FL, the home of Kennedy Space Center, had one of the highest location quotients for aerospace engineers, while areas in Michigan, Indiana, and Ohio had high location quotients for several production occupations.

Location quotients are useful for studying the composition of jobs in an area relative to the average, or for finding areas that have high concentrations of jobs in certain occupations. As measured here, a location quotient shows the occupation's share of an area's employment relative to the national average. For example, a location quotient of 2.0 indicates that an occupation accounts for twice the share of employment in the area than it does nationally, and a location quotient of 0.5 indicates the area's share of employment in the occupation is half the national share. For instance, home health aides accounted for nearly 2 percent of employment in North Carolina in May 2009, but less than 1 percent of employment in the United States, giving the occupation a location quotient of more than 2 in North Carolina.

Location quotients show how occupations are spread out across the country. The location quotients for some occupations clustered around 1.0, indicating that they were found in similar proportions in most areas. For example, the location quotients for janitors ranged from 0.5 to 1.6, and those for receptionists and information clerks

ranged from 0.5 to 1.7. (Chart 1; see page 11 to view the data in table format.)

Other occupations with relatively even geographic distributions included dental assistants, cashiers, and dishwashers.

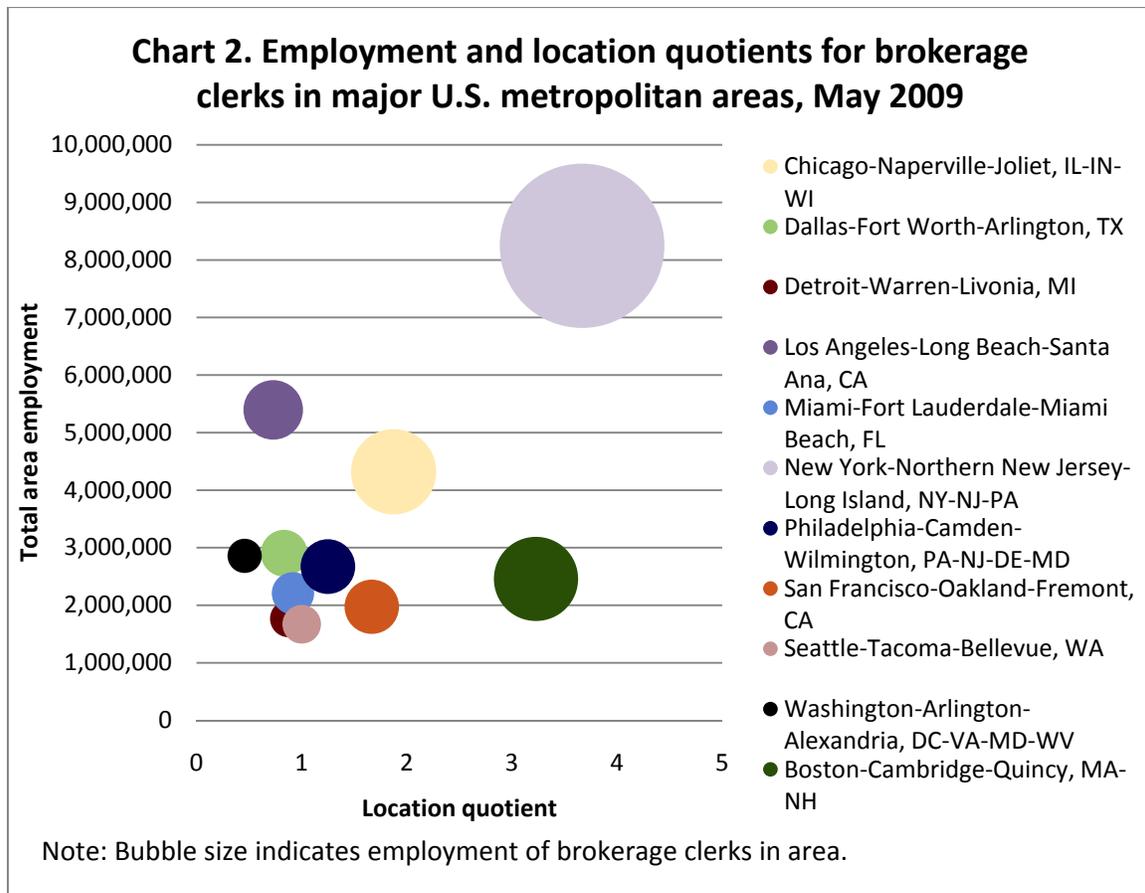
Other occupations were more concentrated and had very high location quotients in some areas. These were often occupations directly related to industries that are geographically concentrated. For example, the employment share of textile knitting and weaving machine setters, operators, and tenders in Dalton, GA, was nearly 197 times the national average; this area also had high location quotients for several other textile and apparel production occupations, as did other southern areas such as Hickory-Lenoir-Morganton, NC; Anderson, SC; and Greensboro-High Point, NC.

Some of the occupations with the highest location quotients were associated with geographical features such as waterways or natural resource deposits. For example, Houma-Bayou Cane-Thibodaux, LA, had very high location quotients for several water transportation occupations, including ship engineers, with a location quotient of 91; sailors and marine oilers, with a location quotient of 114; and captains, mates, and pilots of water vessels, with a location quotient of 150. Similarly, occupations associated with mining or oil and gas extraction tended to have very high location quotients in some areas. Charleston, WV, had location quotients of 52 for mine cutting and channeling machine operators and 66 for mining roof bolters, while Odessa, TX, had high concentrations of several oil-related occupations, including location quotients of 29 and 58, respectively, for roustabouts and oil, gas, and mining service unit operators.

In some cases, more complex patterns emerge. Chart 2 shows employment and location quotients for brokerage clerks in the largest metropolitan areas in the United

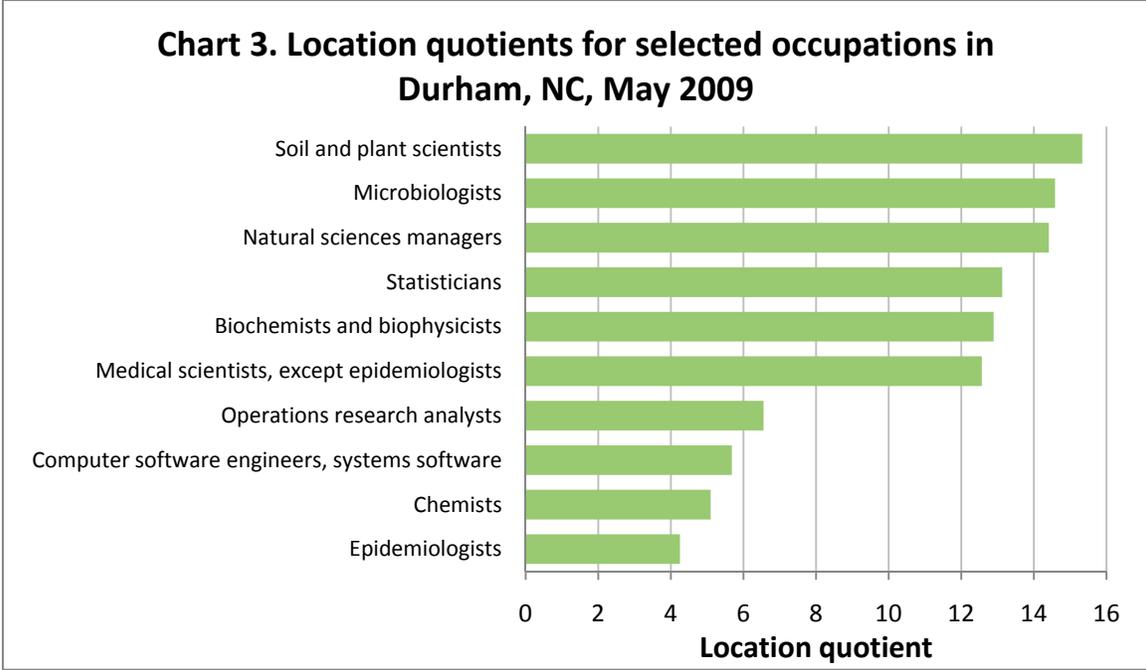
States. In general, areas with higher employment of brokerage clerks also had higher location quotients for this occupation, suggesting that there is some advantage to having large numbers of workers in this financial services occupation clustered together. Because the location quotients control for area size, we might expect that an occupation's employment would not be correlated with the size of the area. However, although the relationship was not extremely strong, brokerage clerks also were somewhat more likely to be employed in areas with higher overall employment.

Some occupations had higher location quotients in smaller areas, such as purchasing agents and buyers of farm products, which were somewhat more likely to be concentrated in areas with low total employment. In this case, there was no correlation between an area's location quotient and employment of this specific occupation: because areas with low overall employment also tend to have low employment of most individual occupations, many of the areas with high concentrations of purchasing agents and buyers of farm products had relatively low employment levels for this occupation. For example, Sioux City, IA-NE-SD, had an employment concentration of nearly 8 times the U.S. average for purchasing agents and buyers of farm products, but had employment of only 50 in this occupation. In contrast, the much larger New York-Northern New Jersey-Long Island, NY-NJ-PA, metropolitan area employed over 500 purchasing agents and buyers of farm products, but had a location quotient of 0.7 for this occupation.



(See page 11 to view these data in table format.)

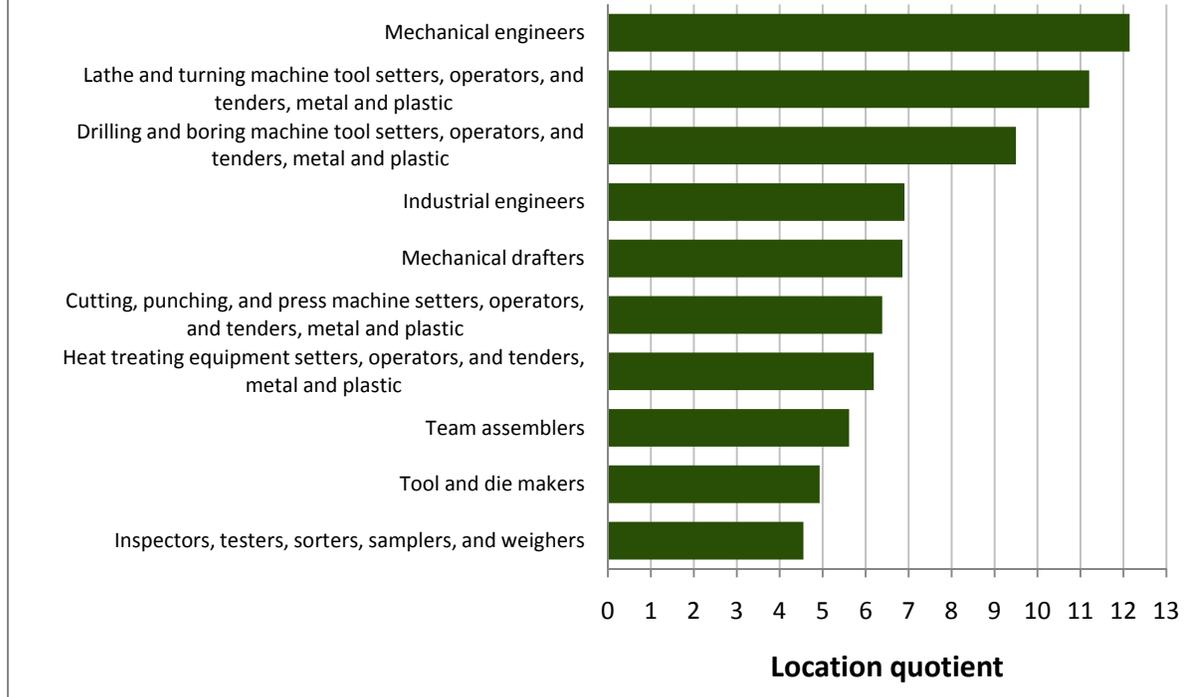
A closer look at two areas—Durham, NC, and Columbus, IN—is provided in charts 3 and 4. Durham, in the heart of North Carolina’s Research Triangle, had high location quotients for several life science occupations, including soil and plant scientists, microbiologists, biochemists and biophysicists, medical scientists, and epidemiologists. This area also had high concentrations of other occupations associated with scientific research, including natural sciences managers and statisticians, as well as computer systems software engineers and several other computer occupations not shown in the chart.



(See page 12 to view these data in table format.)

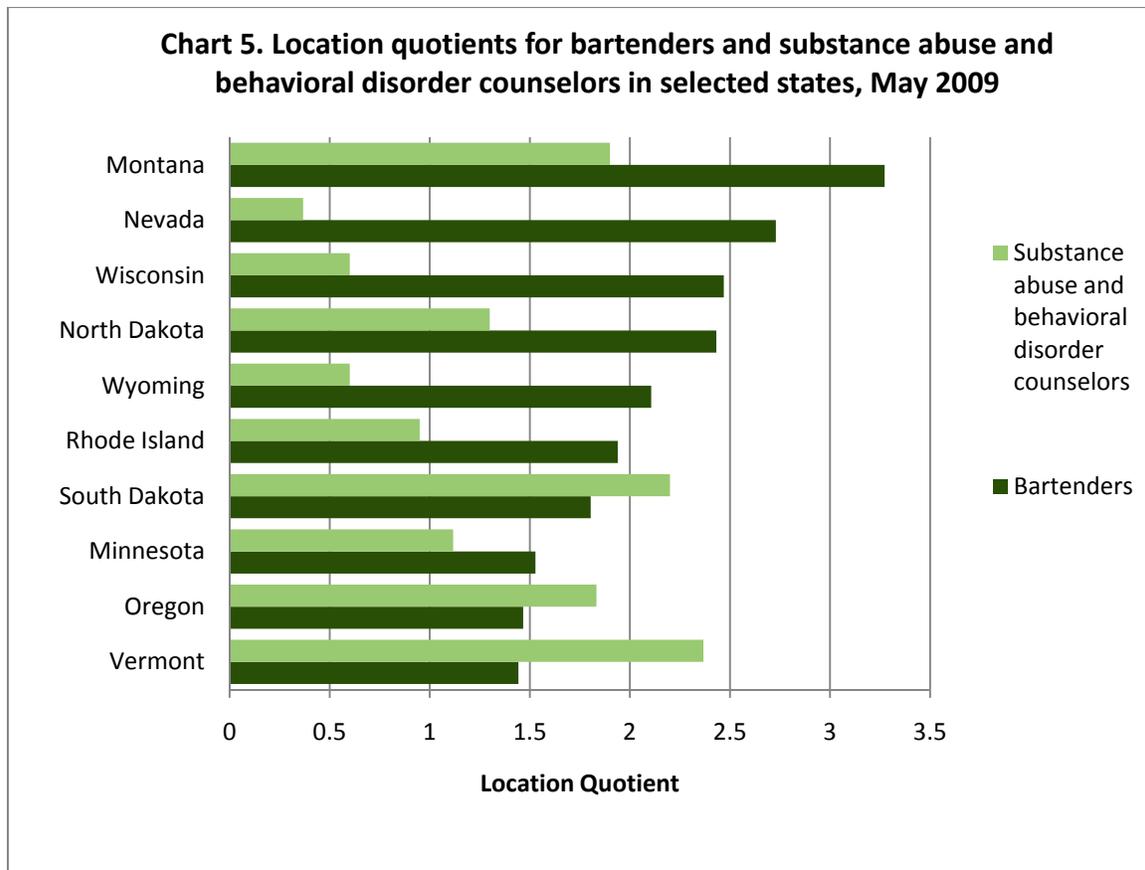
Columbus, IN, had high location quotients for a number of production occupations, including team assemblers; tool and die makers; inspectors, testers, sorters, samplers, and weighers; and several metal and plastic worker occupations. In addition, this area had high concentrations of several occupations associated with the design and engineering stages of the manufacturing process: the concentration of mechanical engineers was over 12 times the U.S. average, while both industrial engineers and mechanical drafters had concentrations nearly 7 times the U.S. average.

Chart 4. Location quotients for selected occupations in Columbus, IN, May 2009



(See page 12 to view these data in table format.)

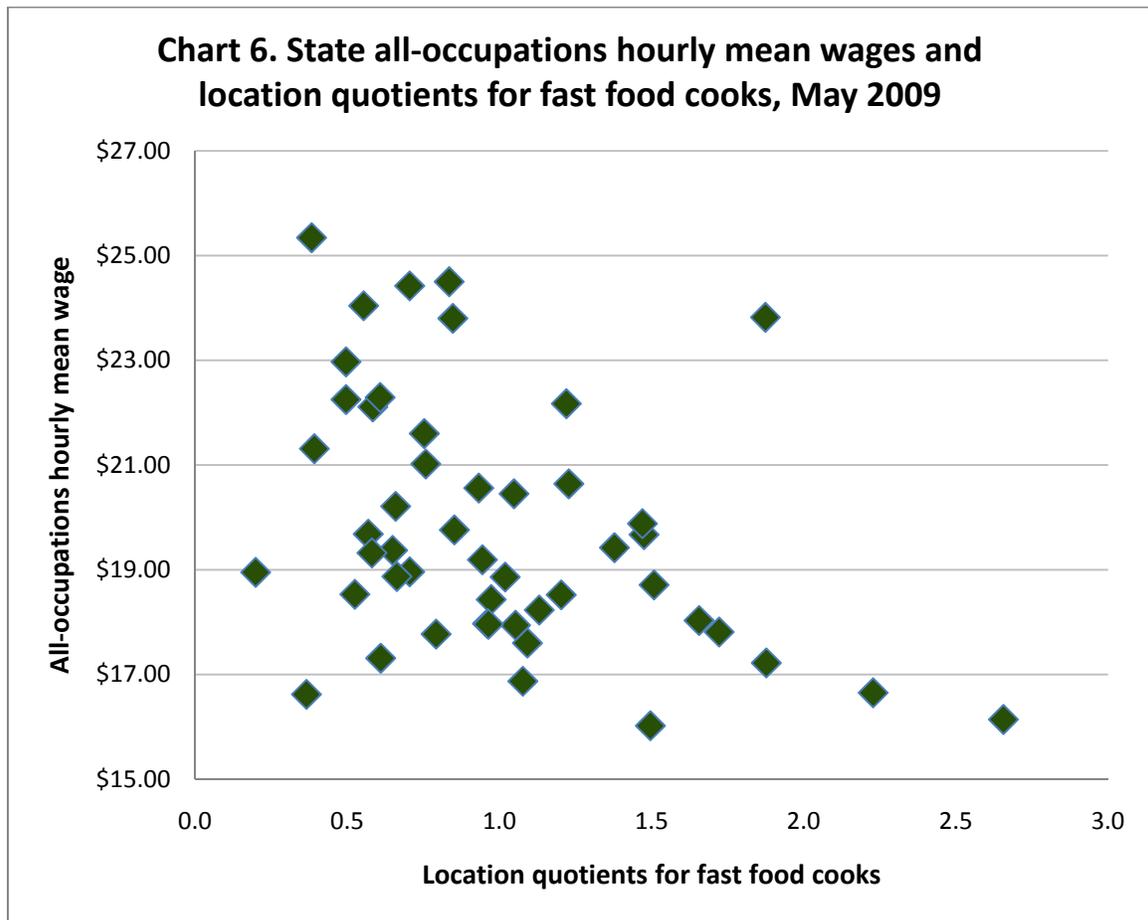
Chart 5 shows location quotients for bartenders and substance abuse and behavioral disorder counselors in various states. As mentioned above, Montana had the highest location quotient for bartenders, at 3.3 times the national average. Montana also had the fourth highest location quotient for substance abuse and behavioral disorder counselors. Several other states had location quotients in the top 10 for both bartenders and substance abuse and behavioral disorder counselors, including South Dakota, Oregon, and Vermont. However, there are exceptions, such as Nevada, where the location quotient for substance abuse and behavioral disorder counselors was smaller than every other state except West Virginia at 0.37.



(See page 12 to view these data in table format.)

Location quotients can also help explain wage differences among areas. The composition of employment in an area influences the average wage in that area. All else equal, areas with higher employment shares of lower paid occupations such as fast food cooks and cashiers will tend to have lower average wages, in part because the concentration of employment in these occupations helps bring down the average area wage. The correlation coefficient on the share of fast food cooks in a state and the state's cross-occupation wage was $-.44$, indicating that, generally, areas with higher concentrations of fast food cooks had lower average wages. (See chart 6.)

Areas with greater concentrations of higher paying occupations such as financial managers and biochemists and biophysicists tended to have higher cross-occupation wages. For example, states with high shares of business and financial operations occupations and computer and mathematical science occupations also tended to have higher wages: average cross-occupation wages and employment shares in these occupations were correlated with coefficients of 0.85 and 0.76, respectively. Other occupations that tended to be more concentrated in higher wage areas were arts, design, entertainment, sports, and media occupations.



(See page 13 to view these data in table format.)

The location quotients used in this highlight were calculated from May 2009 Occupational Employment Statistics; location quotients for all occupations and areas are available at <ftp://ftp.bls.gov/pub/special.requests/oes/oes09loc.zip>. Complete May 2009 OES data are available from the OES home page at www.bls.gov/oes. This highlight was prepared by Ben Cover. For more information, please contact the OES program at www.bls.gov/oes/home.htm#contact.

Table 1. Highest location quotients for selected occupations, May 2009		
Occupation	MSA	Location Quotient
Janitors and cleaners, except maids and housekeeping cleaners	Las Vegas-Paradise, NV	1.64
Receptionists and information clerks	Rapid City, SD	1.75
Dental assistants	Logan, UT-ID	2.34
Cashiers	Kankakee-Bradley, IL	2.65
Dishwashers	Panama City-Lynn Haven, FL	2.73
Massage therapists	Napa, CA	10.84
Metal-refining furnace operators and tenders	Gary, IN	18.54
Aerospace engineers	Huntsville, AL	19.83
Roustabouts, oil and gas	Odessa, TX	29.47
Gaming managers	Atlantic City, NJ	46.00

Table 2. Employment and location quotients for brokerage clerks in major U.S. metropolitan areas, May 2009			
Area	Area Employment	Occupational Employment	Location Quotient
Washington-Arlington-Alexandria, DC-VA-MD-WV	2,857,820	630	0.46
Los Angeles-Long Beach-Santa Ana, CA	5,395,280	1,910	0.73
Dallas-Fort Worth-Arlington, TX	2,904,030	1,170	0.83
Detroit-Warren-Livonia, MI	1,766,340	740	0.88
Miami-Fort Lauderdale-Miami Beach, FL	2,207,330	970	0.92
Seattle-Tacoma-Bellevue, WA	1,670,200	800	1.00
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	2,672,070	1,600	1.25
San Francisco-Oakland-Fremont, CA	1,973,500	1,590	1.67
Chicago-Naperville-Joliet, IL-IN-WI	4,319,720	3,900	1.88
Boston-Cambridge-Quincy, MA-NH	2,457,180	3,800	3.23
New York-Northern New Jersey-Long Island, NY-NJ-PA	8,245,760	14,520	3.67

Table 3. Location quotients for selected occupations in Durham, NC, May 2009

Occupation	Location quotient
Epidemiologists	4.25
Chemists	5.10
Computer software engineers, systems software	5.68
Operations research analysts	6.55
Medical scientists, except epidemiologists	12.56
Biochemists and biophysicists	12.89
Statisticians	13.13
Natural sciences managers	14.41
Microbiologists	14.58
Soil and plant scientists	15.33

Table 4. Location quotients for selected occupations in Columbus, IN, May 2009

Occupation	Location quotient
Inspectors, testers, sorters, samplers, and weighers	4.55
Tool and die makers	4.93
Team assemblers	5.62
Heat treating equipment setters, operators, and tenders, metal and plastic	6.19
Cutting, punching, and press machine setters, operators, and tenders, metal and plastic	6.39
Mechanical drafters	6.86
Industrial engineers	6.91
Drilling and boring machine tool setters, operators, and tenders, metal and plastic	9.50
Lathe and turning machine tool setters, operators, and tenders, metal and plastic	11.21
Mechanical engineers	12.15

Table 5. Location quotients for bartenders and substance abuse and behavioral disorder counselors in selected states, May 2009

State	Location quotient for bartenders	Location quotient for counselors
Vermont	1.44	2.37
Oregon	1.47	1.83
Minnesota	1.53	1.12
South Dakota	1.80	2.20
Rhode Island	1.94	0.95
Wyoming	2.11	0.60
North Dakota	2.43	1.30
Wisconsin	2.47	0.60
Nevada	2.73	0.37
Montana	3.27	1.90

Table 6. State all-occupations hourly mean wages and location quotients for fast food cooks, May 2009

State	Location quotient, fast food cooks	State all-occupations hourly mean wage
Alabama	1.66	18.03
Arizona	1.48	19.67
Arkansas	2.23	16.65
California	1.87	23.82
Colorado	0.58	22.11
Connecticut	0.84	24.50
Delaware	0.50	22.25
Florida	0.71	18.96
Georgia	1.47	19.88
Hawaii	0.93	20.56
Idaho	1.13	18.23
Illinois	1.22	22.17
Indiana	0.97	18.43
Iowa	0.79	17.77
Kansas	1.20	18.52
Kentucky	0.96	17.97
Louisiana	1.09	17.60
Maine	0.53	18.53
Maryland	0.85	23.80
Massachusetts	0.38	25.34
Michigan	1.23	20.64
Minnesota	0.75	21.60
Mississippi	2.66	16.14
Missouri	0.66	18.87
Montana	1.08	16.87
Nebraska	1.05	17.94
Nevada	1.38	19.42
New Hampshire	0.76	21.02
New Jersey	0.55	24.04
New Mexico	1.51	18.71
New York	0.71	24.42
North Carolina	0.20	18.95
North Dakota	0.61	17.31
Ohio	0.65	19.37
Oklahoma	1.88	17.22
Oregon	1.05	20.45
Pennsylvania	0.66	20.21
Rhode Island	0.39	21.31
South Carolina	1.72	17.81
South Dakota	1.50	16.02
Tennessee	0.96	17.96
Texas	0.85	19.76
Utah	1.02	18.86
Vermont	0.57	19.68
Virginia	0.61	22.29
Washington	0.50	22.97
West Virginia	0.37	16.62
Wisconsin	0.58	19.32
Wyoming	0.94	19.19