The prominence of Boston area colleges and universities

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The Boston metropolitan area[1] is recognized by many for its concentration of prestigious private colleges and universities. The metropolitan area is home to 85 private colleges and universities employing 70,000 people and attracting more than 360,000 students from all over the world. This report uses employment and wage data from the Bureau of Labor Statistics (BLS) Quarterly Census of Employment and Wages (QCEW) program for the years 1990 and 2007[2] to analyze the labor market impact and contribution of these institutions of higher education to the Boston area economy.

The analysis indicates a strong and steady growth in both wages and employment, with job creation in colleges and universities almost double the rate for total private employment. Wage gains also were higher for those working in colleges and universities than for those in overall private industry. The continuing growth of colleges and universities enhances the quality of the labor force and fuels knowledge-based industries, which are attracted by that quality.

Higher education employment

In 1990, there were almost 2,000 private colleges and universities in the United States, employing a total of almost 725,000 workers. (See table 1.) Massachusetts had 82 private colleges and universities, employing more than 69,000. Fifty-eight of those institutions (70.7 percent) were located in the Boston area, employing almost 58,000 workers.

By 2007, there were dramatic increases in the number of colleges and universities, as well as in their employment. In the United States, there were almost 4,400 private colleges and universities, employing an estimated 1,060,000 workers. Massachusetts colleges and universities had grown to 124, employing almost 85,000. Eighty-five (68.5 percent) of those institutions were in the Boston area, employing more than 70,000 workers.

Higher education job growth

In the Nation over the 17-year period from 1990 to 2007, overall job growth increased by 25.5 percent while the growth in college and university employment was 46.7 percent. Massachusetts employment gains in colleges and universities were almost double the overall percentage of growth in the private sector (22.2 percent, compared with 11.3 percent). While the Massachusetts economy added 288,000 jobs over the period, 5.4 percent of the total growth, or 15,400 jobs, were attributable to gains in higher education employment. The Boston area accounted for approximately 80 percent of the overall job gains in colleges and universities, with 12,000 jobs added over the 17-year period, for a growth rate of 20.9 percent, well above the overall increase of 12.9 percent for the metropolitan area.

Metropolitan area comparisons

Using a location quotient[3] comparison among the largest metropolitan areas in the Nation confirms the dominance and importance that higher education employment had in the Boston area over the 17-year period. In 1990, Boston ranked first among major metropolitan areas, with a location quotient of 3.92. Seventeen years later, the Boston area still ranked first, with a location quotient of 3.59. (See chart 1.) The Boston area location quotient indicates that college and university employment was approximately three-and-a-half times more concentrated, compared with the U.S. average, and shows that none of the other major metropolitan areas came close to matching the Boston area's concentration of employment in higher education.

Job generators

The concentration of colleges and universities in both Massachusetts and the Boston metropolitan area has a positive impact on the quality of the labor force. The highly educated workforce attracts knowledge-based industries such as professional and business services, financial activities, and navigational, measuring, electromedical, and control instruments manufacturing.

Colleges and universities themselves are a knowledge-based industry that requires a highly skilled labor force to educate students, and the results benefit the Boston area by increasing the percentage of the workforce with college degrees. Nationally in 2007, 27.5 percent of adults 25 years and older had bachelor's degrees and 10.1 percent had more advanced degrees. Among the 50 States, Massachu-

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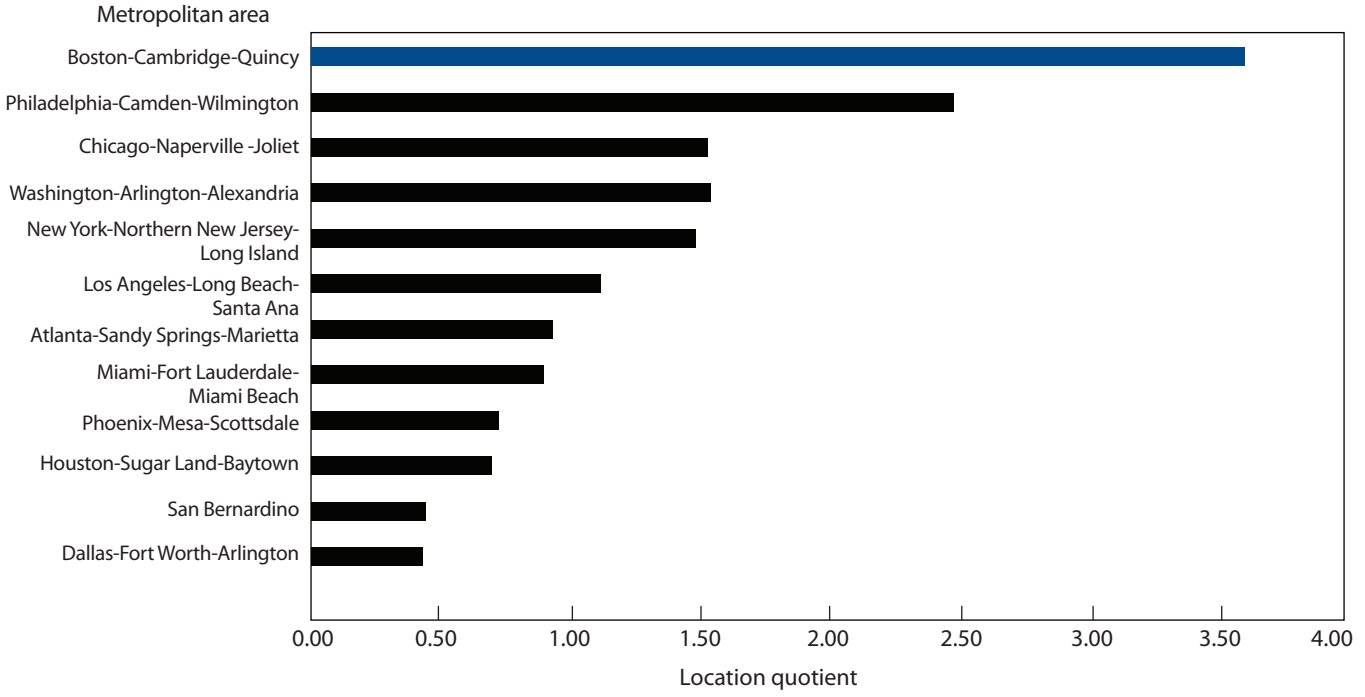
Table 1. Total private employment and employment in colleges and universities, United States, Massachusetts, and Boston metropolitan area, 1990 and 2007 annual averages

Employment and wages	Number		Change, 1990–2007	
	1990	2007	Number	Percent
United States				
Employment:				
Total private establishments	5,860,445	8,681,001	2,820,556	48.1
Total private employment	90,855,141	114,012,221	23,157,080	25.5
Colleges and universities' establishments	1,985	4,389	2,404	121.1
Colleges and universities' employment	723,107	1,060,666	337,559	46.7
Colleges and universities' share of total private employment	.80	.93	–	–
Location quotient	1.00	1.00	–	–
Wages:				
Total private average weekly wage	$447	$853	$406	90.8
Total private average annual wage	23,262	44,362	21,100	90.7
Colleges and universities' average weekly wage	458	925	467	102.0
Colleges and universities' average annual wage	23,835	48,098	24,263	101.8
Massachusetts				
Employment:				
Total private establishments	164,346	204,301	39,955	24.3
Total private employment	2,537,238	2,824,834	287,596	11.3
Colleges and universities' establishments	82	124	42	51.2
Colleges and universities' employment	69,423	84,847	15,424	22.2
Colleges and universities' share of total private employment	2.74	3.00	–	–
Location quotient	3.44	3.23	–	–
Employment:				
Total private average weekly wage	$510	$1,073	$563	110.4
Total private average annual wage	26,497	55,798	29,301	110.6
Colleges and universities' average weekly wage	521	1,095	574	110.2
Colleges and universities' average annual wage	27,080	56,927	29,847	110.2
Boston metropolitan area				
Employment:				
Total private establishments	113,165	135,840	22,675	20.0
Total private employment	1,859,951	2,099,976	240,025	12.9
Colleges and universities' establishments	58	85	27	46.6
Colleges and universities' employment	57,960	70,089	12,129	20.9
Colleges and universities' share of total private employment	3.12	3.34	–	–
Location quotient	3.92	3.59	–	–
Wages:				
Total private average weekly wage	$538	$1,168	$630	117.1
Total private average annual wage	27,988	60,725	32,737	117.0
Colleges and universities' average weekly wage	527	1,136	609	115.6
Colleges and universities' average annual wage	27,387	59,058	31,671	115.6

NOTE: Dash indicates not applicable.

SOURCE: BLS Quarterly Census of Employment and Wages (QCEW) program.

Chart 1. Location quotients for colleges and universities in 12 of the largest metropolitan areas, 2007 annual averages



setts ranked first in the percentage of adults with both bachelor's degrees and advanced degrees. In 2007, 37.9 percent of Massachusetts adults had completed a bachelor's degree and 16 percent had completed an advanced degree. In the Boston area, an even greater percentage of the population—more than 40 percent—had bachelor's degrees.[4]

Massachusetts has consistently attracted venture capital funds for biotechnology-related investments. In 2007, Massachusetts attracted almost $1.5 billion in investment funds for biotechnology firms, up from $1.3 billion in 2006.[5] To further highlight local prominence in knowledge-based industries, despite being ranked 13th in population, Massachusetts had the fifth-highest number of patents granted in 2007.[6] Boston's reputation and prominence have been strengthened by the fact that 56 Nobel laureates have taught and do research in the area's colleges and universities.

Industry concentration

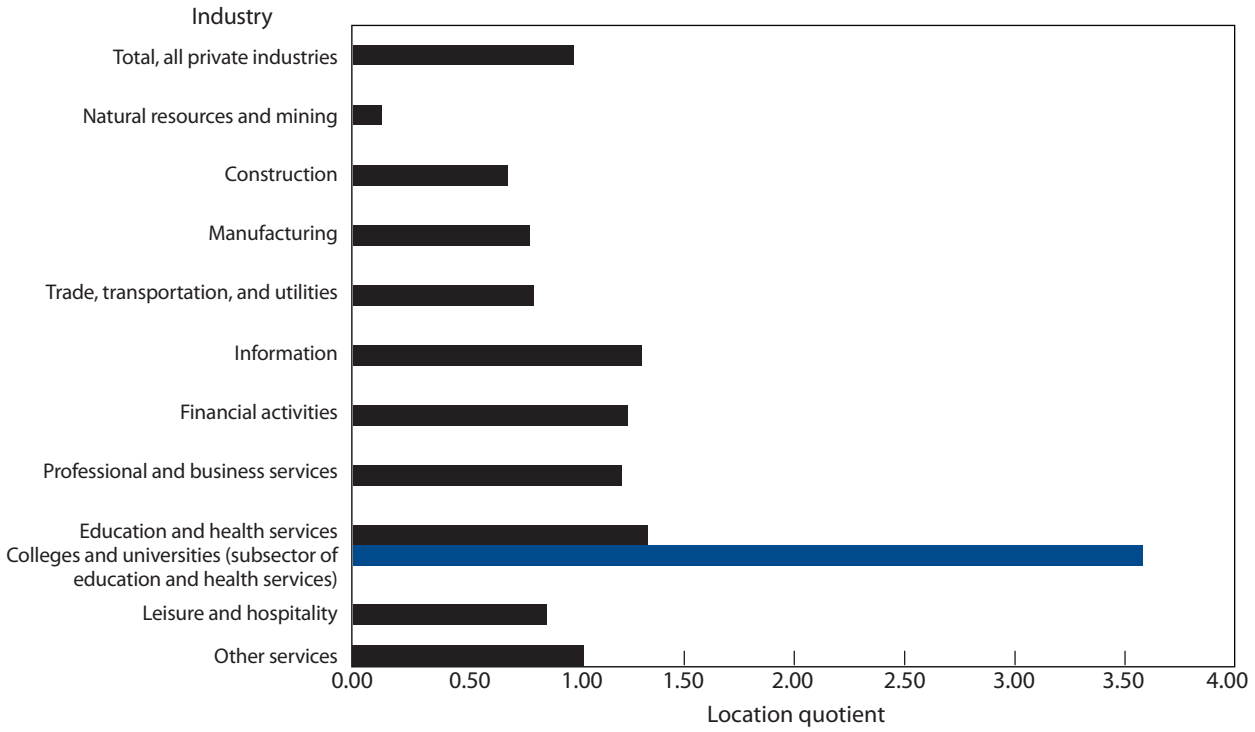
Using location quotient analysis at the supersector[7] industry level highlights those industries which are prominently concentrated in the Boston area. An examination of the 10 supersector industries in 2007 indicates that the highest concentrated industry in Boston was education and health services (location quotient = 1.34), an industry that includes not only colleges and universities, but nursing homes, hospitals, and elementary and secondary schools. (See chart 2.) In Boston, employment in this supersector was 34 percent higher than the national average.

The Boston area also had a high concentration of other knowledge-based industries, including information (location quotient = 1.31); financial activities (1.25); and professional and business services (1.22). These industries are generally regarded as knowledge-based industries with high wages. In contrast, Boston had lower-than-average concentrations in such industries as manufacturing, construction, and natural resources and mining.

Higher education wages

In 1990, total U.S. private average weekly wages were $447. (See table 1.) Massachusetts and Boston, with average weekly wages of $510 and $538, respectively, were 14 percent and 20 percent above the national average weekly wage. Massachusetts ranked fifth highest in average weekly wages among the 50 States in 1990. The average weekly wage in colleges and universities in 1990 was $458 nationally, $521 in Massachusetts, and $527 in the Boston area.

Chart 2. Location quotients in the Boston metropolitan area, by industry supersector, 2007 annual averages



Seventeen years later, in 2007, Massachusetts ranked third highest among the 50 States in the average weekly wage for private-industry workers, at $1,073. Wages for colleges and universities in Massachusetts were $1,095, slightly above the average for all private industry.

In the Boston area, where high-paying industries such as high technology, finance, and biotechnology are more concentrated, college and university wages were $1,136, slightly lower than the $1,168 average for private industry. From 1990 to 2007, private-industry wage gains were 91 percent nationally, but 110 percent in Massachusetts and 117 percent in Boston. Those working in colleges and universities saw a national average weekly pay increase of 102 percent, a gain of 110 percent in Massachusetts, and an increase of 116 percent in Boston.

In 2007, total private wages in the United States were $5.0 trillion, of which $51 billion was generated by colleges and universities. Thus, roughly 1.0 percent of all national wages was earned in colleges and universities. In contrast, total private wages in Boston were $127.5 billion, of which $4.1 billion, or 3.2 percent, were earned in higher education.

Summary

In Massachusetts and, more specifically, the Boston metropolitan area, colleges and universities have exerted an important positive influence on the local and regional labor market economies. Compared with the Nation and the largest metropolitan areas in the country, Boston has the highest industry concentration, or location quotient, for colleges and universities, both in 2007 and historically back to 1990.

Colleges and universities have a measurable economic impact in Boston. Over the 17-year period examined, they acted as a powerful job generator, with job growth roughly twice the rate for total private industry. Boston area colleges and universities' total wages as a proportion of total private wages were 3.2 percent, compared with 1.0 percent nationally. In addition, colleges and universities have a powerful economic impact by improving the quality of the labor force. As a result, the Boston area's highly educated labor force continues to attract knowledge-based industries such as high technology, biotechnology, and financial services. These industries have high wages, generate jobs faster than overall job growth does, and attract much-needed venture capital funds required to sustain the area's prominence as a center for higher education and research. □

Notes

[1] According to the BLS Quarterly Census of Employment and Wages (QCEW), the Boston metropolitan area is defined as all cities and towns in the Boston-Cambridge-Quincy, MA-NH, Metropolitan Statistical Area, which includes the Boston-Quincy, MA, Metropolitan Division—Norfolk, Plymouth, and Suffolk Counties; Cambridge-Newton-Framingham, MA, Metropolitan Division—Middlesex County; Essex County, MA, Metropolitan Division—Essex County; and Rockingham County-Strafford County, NH, Metropolitan Division—Rockingham and Strafford Counties.

[2] 1990 was chosen because it was the earliest year that the QCEW used the North American Industry Classification System (NAICS) code 611310, which includes all private 4-year colleges, universities, and professional schools (for example, business administration, dental, law, and medical schools), as well as theological seminaries, that grant baccalaureate or graduate degrees.

[3] A location quotient is the ratio of the concentration of a resource or activity, such as employment, in a defined area, such as a State, to the concentration of the same resource or activity in a larger area, such as the Nation. The national location quotient for each industry is always 1.0. (For more on location quotients, see "Quarterly Census of Employment and Wages: Location Quotient Calculator," on the Interntet at **www.bls.gov/cew/cewlq.htm**, visited June 19, 2009.)

[4] Educational attainment data are from the U.S. Census Bureau's American Community Survey, 2007.

[5] According to Dow Jones VentureSource.

[6] According to the U.S. Patent Trademark Office.

[7] Under NAICS, the industrial composition and organization of industries are defined by the type of activity or sector they are engaged in. The analysis presented in this report uses the BLS standard for sector aggregation at the two-digit level, of which there are 11 "supersectors": natural resources and mining; construction; manufacturing; trade, transportation, and utilities; information; financial activities; professional and business services; educational and health services; leisure and hospitality; other services; and government. This report excludes the government supersector.