



Regional Report

SUMMARY 09-01

FEBRUARY 2009

U.S. BUREAU OF LABOR STATISTICS

The Prominence of Colleges and Universities in the Boston Metropolitan Area

Employment and wage data from the BLS Quarterly Census of Employment and Wages (QCEW) are used to analyze the labor market impact and contributions of colleges and universities in the Boston area economy.

Authors:

Denis M. McSweeney
Regional Commissioner
Boston/New York Regional Office

Walter J. Marshall
Regional Economist
formerly with the
Boston Regional Office



The Boston metropolitan area¹ is recognized by many for its concentration of prestigious private colleges and universities. The metropolitan area is home to over 80 private colleges and universities employing 68,600 people and attracting over 360,000 students from all over the world. This report uses employment and wage data from the Bureau of Labor Statistics' Quarterly Census of Employment and Wages (QCEW) program for the years 1990 and 2006² 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, Past and Present

In 1990, there were almost 2,000 private colleges and universities in the United States, employing 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 2006, there were dramatic increases in the number of colleges and universities, as well as in their employment. In the United States, there were 4,000 private colleges and universities, employing an estimated 1,030,000 workers. Massachusetts' colleges and universities had grown to 120, employing almost 83,000. Eighty-three (69.2 percent) of those institutions were in the Boston area, employing over 68,000 workers.

Colleges' and Universities' Job Growth from 1990 to 2006

In the Nation over this 16-year period, overall job growth increased by 24.1 percent, while the growth in college and university employment was 42.4 percent. Massachusetts employment gains in colleges and universities were almost double the overall percentage of growth in the private sector (19.5 percent, compared with 9.9 percent).

While the Massachusetts economy added 250,000 jobs over the period, 5 percent of the total growth, or 13,500 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 10,600 jobs added over the 16-year period, for a growth rate of 18.4 percent, well above the overall increase of 11.1 percent for the metropolitan area.

Colleges' and Universities' Industry Concentration among the Largest Metropolitan Areas

Using a location quotient³ com-

parison among the largest metropolitan areas nationally confirms the dominance and importance that higher education employment had in the Boston area over the 16-year period. In 1990, Boston ranked first among major metropolitan areas, with a location quotient of 3.92.

Sixteen years later, the Boston area still ranked first, with a location quotient of 3.63. (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.

Colleges and Universities as a Generator of Jobs for the Knowledge-Based Industries

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.

While colleges and universities are a knowledge-based industry that requires a highly skilled labor force to educate students, the results benefit the Boston area by increasing the percentage of the workforce with col-



lege degrees. Nationally in 2006, 27 percent of adults 25 years and older had bachelor's degrees and 9.9 percent had more advanced degrees. Among the 50 States, Massachusetts ranked first, with 37 percent of people with bachelor's degrees, and second highest (15.6 percent), or virtually identical to Maryland's rate of 15.7 percent in people with advanced degrees. In the Boston area, an even greater percentage of the population—more than 40 percent—had bachelor's degrees.⁴

Boston has consistently attracted venture capital funds for biotechnology-related investments. In 2006, the Boston area attracted almost \$1.1 billion in investment funds for biopharmaceuticals and almost \$400 million for medical devices, ranking it second to San Francisco, which reported \$1.3 billion for biopharmaceuticals and \$1.1 billion for medical de-

TABLE 1: *Employment and wages in the total private sector and in colleges and universities in the U.S., Massachusetts, and the Boston metropolitan area, annual averages, 1990 and 2006*

	1990	2006	Change, 1990–2006	
	United States		Number	Percent
Employment				
Total private establishments	5,860,445	8,505,496	2,645,051	45.1
Total private employment	90,855,141	112,718,858	21,863,717	24.1
Colleges and universities, establishments	1,985	4,049	2,064	104.0
Colleges and universities, employment	723,107	1,030,032	306,925	42.4
Colleges and universities, share of total private employment	.80%	.91%	—	—
Location quotient	1.00	1.00	—	—
Wages				
Total private average weekly wage	\$447	\$816	\$369	82.6
Total private average annual wage	\$23,262	\$42,414	\$19,152	82.3
Colleges and universities, average weekly wage	\$458	\$885	\$427	93.2
Colleges and universities, average annual wage	\$23,835	\$46,039	\$22,204	93.2
	Massachusetts		Number	Percent
Employment				
Total private establishments	164,346	201,657	37,311	22.7
Total private employment	2,537,238	2,789,469	252,231	9.9
Colleges and universities, establishments	82	120	38	46.3
Colleges and universities, employment	69,423	82,952	13,529	19.5
Colleges and universities, share of total private employment	2.74%	2.97%	—	—
Location quotient (LQ)	3.44	3.25	—	—
Wages				
Total private average weekly wage	\$510	\$1,016	\$506	99.2
Total private average annual wage	\$26,497	\$52,837	\$26,340	99.4
Colleges and universities, average weekly wage	\$521	\$1,033	\$512	98.3
Colleges and universities, average annual wage	\$27,080	\$53,726	\$26,646	98.4
	Boston		Number	Percent
Employment				
Total private establishments	113,165	134,309	21,144	18.7
Total private employment	1,859,951	2,066,158	206,207	11.1
Colleges and universities, establishments	58	83	25	43.1
Colleges and universities, employment	57,960	68,606	10,646	18.4
Colleges and universities, share of total private employment	3.12%	3.32%	—	—
Location quotient	3.92	3.63	—	—
Wages				
Total private average weekly wage	\$538	\$1,106	\$568	105.6
Total private average annual wage	\$27,988	\$57,533	\$29,545	105.6
Colleges and universities, average weekly wage	\$527	\$1,066	\$539	102.3
Colleges and universities, average annual wage	\$27,387	\$55,447	\$28,060	102.5

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

vices.⁵ To further highlight local prominence in knowledge-based industries, despite being ranked 13th in population, Massachusetts had the fourth-highest number of patents granted in 2006.⁶ Boston's reputation and prominence have been strengthened due to the fact that 56 Nobel laureates have taught and do research in the area's colleges and universities.

Supersector Industry Concentration among the Largest Metropolitan Areas

Using location quotient analysis at the supersector⁷ industry level highlights those industries, which are prominently concentrated in the Boston area. An examination of the 10 supersector industries in 2006 indicates that the highest concentrated industry in Boston was education and health services (location quotient = 1.34), which includes not only colleges and

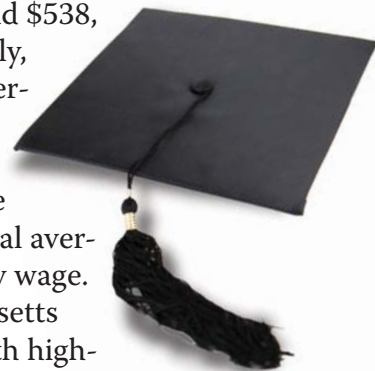
universities, but nursing homes, hospitals, and elementary and secondary schools. (See chart 2.) In Boston, employment in this supersector was 34 percent higher than the national average.

The Boston area also had a high concentration of other knowledge-based industries including information (location quotient = 1.32), financial activities (1.24), and professional and business services (1.22). These industries are generally regarded as knowledge based with high wages and have a minimal negative environmental impact. In contrast, Boston had lower-than-average concentrations in such industries as manufacturing, construction, and natural resources and mining.

Wages in Colleges and Universities, 1990–2006

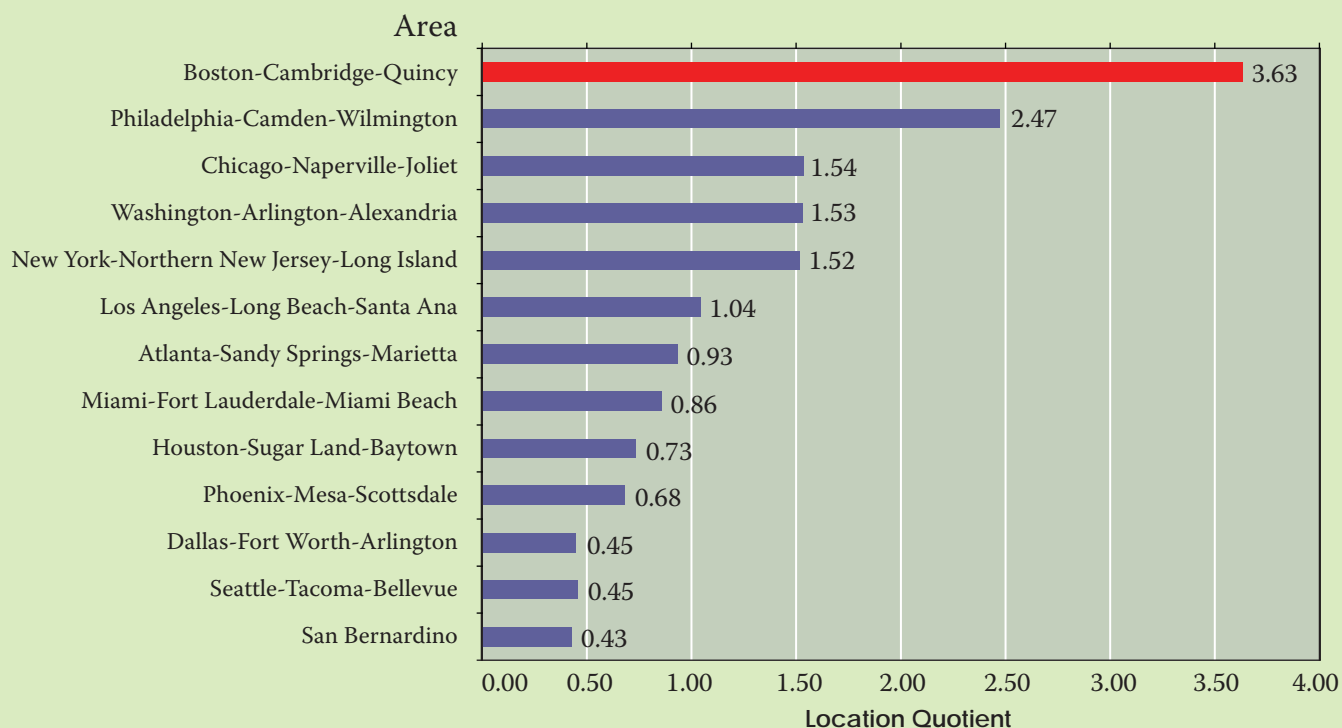
In 1990, total U.S. private aver-

age 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.



Sixteen years later, in 2006, Massachusetts ranked third highest among the 50 States in the average weekly wage for private-industry workers, at

CHART 1: Location quotients for colleges and universities in the 13 largest metropolitan areas, annual average, 2006



Note: U.S. location quotient for colleges and universities = 1.00.
Source: BLS Quarterly Census of Employment and Wages (QCEW).

\$1,016. Wages for colleges and universities in Massachusetts were \$1,033, or slightly above the average for all private industry. In the Boston area, college and university wages were \$1,066, slightly lower than the \$1,106 average for private industry, where high-paying industries such as high technology,

finance, and biotechnology are more concentrated. From 1990 to 2006, private-industry wage gains were 82 percent nationally, but 99 percent in Massachusetts and 106 percent in Boston. Those working in

colleges and universities saw a national average weekly pay increase of 93 percent, a gain of 98 percent in Massachusetts, and an increase of 102 percent in Boston.

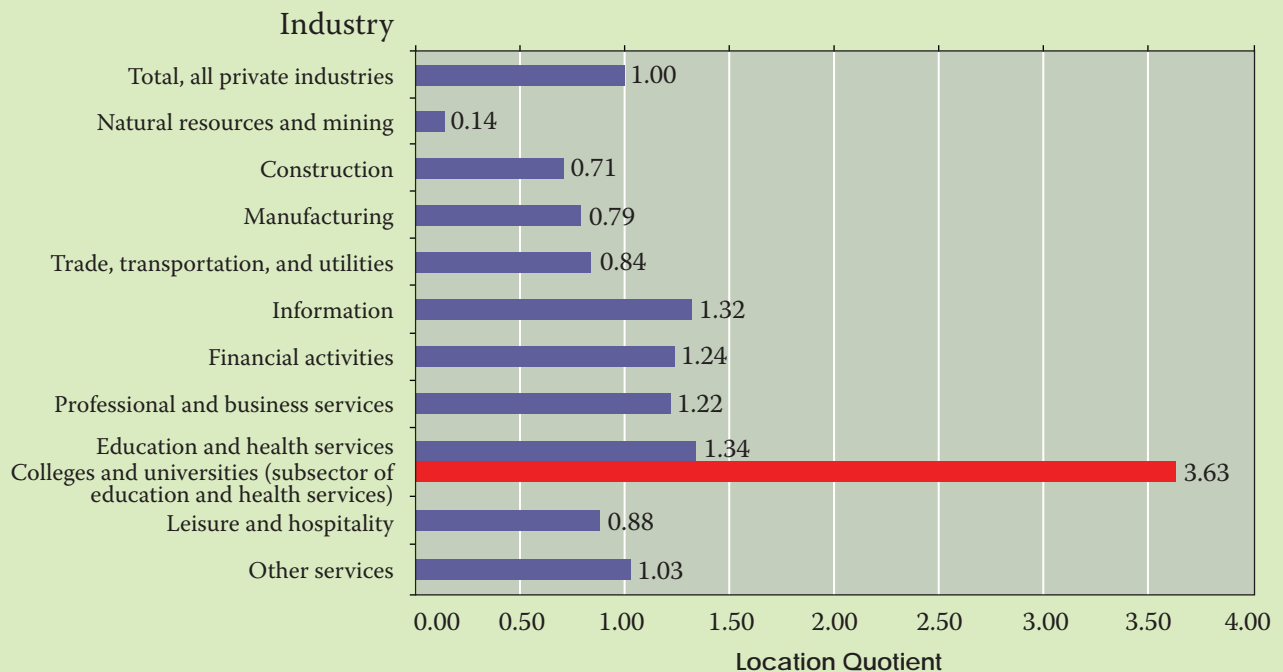
In 2006, total private wages in the United States were \$4.7 trillion, of which \$47 billion were generated by colleges and universities. Thus, roughly 1.0 percent of all national wages were earned in colleges and universities. In contrast, total private wages in Boston were \$118 billion, of which \$3.8 billion, or 3.2 percent, were earned in higher education.

Summary

In Massachusetts and, more specifically, in 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



CHART 2: Location quotients, by industry supersector in the Boston metropolitan area, annual average, 2006



Note: U.S. concentration for industry supersector = 1.00.
Source: BLS Quarterly Census of Employment and Wages (QCEW).

the largest metropolitan areas in the country, Boston has the highest industry concentration, or location quotient, for colleges and universities, both in 2006 and historically back to 1990.

Colleges and universities have a measurable economic impact in Boston. Over the 16-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 only 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. 🌱

Footnotes

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-Stafford 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) as well as theological seminaries, that grant baccalaureate or graduate degrees.

³ Location quotient analysis quantifies the concentration of college and university employment as an industry at the national, State, and metropolitan area levels. The national location quotient for each industry is always 1.0.

⁴ Educational attainment data are from the U.S. Census Bureau's American Community Survey, 2006.

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. This analysis 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.

