

3-21-1991

Social Investment in Massachusetts Public Higher Education: A Comparative Analysis

Clyde W. Barrow

Southeastern Massachusetts University

Follow this and additional works at: <http://scholarworks.umb.edu/nejpp>

 Part of the [Education Policy Commons](#), [Higher Education Administration Commons](#), and the [State and Local Government Law Commons](#)

Recommended Citation

Barrow, Clyde W. (1991) "Social Investment in Massachusetts Public Higher Education: A Comparative Analysis," *New England Journal of Public Policy*: Vol. 7: Iss. 1, Article 7.

Available at: <http://scholarworks.umb.edu/nejpp/vol7/iss1/7>

This Article is brought to you for free and open access by ScholarWorks at UMass Boston. It has been accepted for inclusion in New England Journal of Public Policy by an authorized administrator of ScholarWorks at UMass Boston. For more information, please contact library.uasc@umb.edu.

Social Investment in Massachusetts Public Higher Education

A Comparative Analysis

Clyde W. Barrow

State expenditures on public higher education are increasingly viewed as a social investment that is necessary to sustain economic growth in a postindustrial economy. However, an analysis of comparative data indicates that state support for such education was below national averages during the 1980s and, when compared to its major competitor states, Massachusetts ranks poorly in support for these institutions. This article concludes that unless state support is increased over the next decade, Massachusetts will risk losing its competitive economic position, while educational administrators will be forced to choose between access or quality in public higher education.

This article contains an analysis of social investment in public higher education by the Commonwealth of Massachusetts, whose current investment policy is scrutinized against two standards of measurement. First, it compares revenues, expenditures, and student costs in the commonwealth to national averages derived mainly from the U.S. Department of Education's Higher Education General Information Survey. Second, it ranks the commonwealth's performance in these same areas against sixteen other states, each of which maintains a comparable public higher education system and competes with Massachusetts in such fields as high technology, financial services, biomedical research, ocean resource development, and manufacturing.¹

The data indicates that, compared to national standards, the commonwealth's investment in public higher education has been average to below average. Moreover, compared to its major competitors among the largest industrial and high technology states, Massachusetts ranks poorly in funding public higher education. Indeed, until 1988, nearly every revenue stream available to the commonwealth's public higher institutions showed a below-average performance, although the most serious shortfall during the last three years has been in state appropriations.

Consequently, the conclusion of the analysis is that state support for public higher education must increase substantially over the next decade if Massachusetts is to maintain its competitive economic position. It is recognized that such a recommendation may not be well received in a political climate of emphasis on downsizing, restructuring, and cost

Clyde W. Barrow is associate professor, Department of Political Science and Dubin Labor Education Center, Southeastern Massachusetts University.

containment.² However, other recent studies support the claim that during the last decade Massachusetts actually underfunded two key spending sectors — education and infrastructure — even though these represent the two social investments most directly correlated with future economic performance.³

Why Invest in Public Higher Education?

The concept of social investment refers to two types of capital expenditures by the public sector that increases the long-term productive capacities of the private economy. Social investments in *physical capital* consist mainly of infrastructure such as roads, highways, airports, industrial parks, and similar projects that are necessary to facilitate economic growth and expansion. Social investments in *human capital* consist mainly of educational expenditures that are necessary to maintain adequate work force skills and facilitate increased productivity by the current and future work force.⁴

The benefits of social investment are generally realized in three ways. First, it supplies capital resources that are necessary to a favorable business climate and, hence, to aggregate increases in economic and employment growth. Contrary to long-held perceptions, a new generation of business climate surveys increasingly find that for postindustrial economies it is not tax rates, but tax expenditures on social capital that are the important factor in sustaining a favorable business climate.⁵ Second, if directed toward the development of human capital resources, social investment also results in rising income levels that further sustain long-term economic growth. Finally, rising incomes also produce additional public revenue that may subsequently be used to finance social expenses such as health care, unemployment insurance, and disability payments.

In this context, it is generally recognized that the states and nations which will be able to compete most effectively in the coming decades are those with a “deeply educated” population of skilled workers. The concept of such a work force, as opposed to one whose education is broad but shallow, must be understood against the continuing shift away from a “Fordist” model of economic development that has dominated U.S. public policy.⁶ This model was based on the economic dominance of mass manufacturing industries during the last century.

The Fordist model of economic growth relied on a work force that consisted of two distinct groups of personnel: a small group of highly skilled (i.e., deeply educated) managers, engineers, and professionals on one side and a large unskilled and semiskilled work force whose education was broad but confined merely to the elementary “basics” of reading, writing, arithmetic, on the other. Traditionally, therefore, the manpower mission of higher institutions has focused almost exclusively on educating the small group of managers, engineers, and professionals at the apex of the model pyramid. Elementary and secondary schools have fulfilled the manpower mission of providing a broadly educated population with basic skills in the three R’s.⁷

However, the most advanced sectors of the economies of Europe, Japan, and the United States are currently shifting away from the old Ford model of industrial development to a “post-Fordist” model of postindustrial development. This means, quite simply, that the engine of economic growth is shifting away from mass manufacturing industries that rely on large populations of unskilled and semiskilled workers to information- and technology-based industries that require sizable populations of deeply educated workers.⁸ As a result, political economists have increasingly concluded that colleges and universities are the engines that will power successful postindustrial economies into the next century.⁹

For example, labor market projections by the Commission on Work, Family, and Citizenship indicate that by the year 2000 nearly 70 percent of the nation's jobs will require some level of postsecondary higher education.¹⁰ Similarly, a U.S. Labor Department occupational forecast by George T. Silvestri and John M. Lukasiewicz projects that between 1986 and 2000 nearly 40 percent of all new jobs will be created in only three occupational groupings: executive/administrative/managerial, professional, and technical and technical support.¹¹ This structural shift in work force composition has been more characteristic of Massachusetts than of any other state in the nation and is projected to continue in the 1990s.¹² By contrast, Silvestri and Lukasiewicz project much lower employment in the traditional high-wage blue-collar occupations that require only a basic education. The notable exception is that employment in the minimum-wage, low-benefit service sector will be the one substantial growth area requiring no postsecondary education.

Labor market projections suggest that two radically different patterns of postindustrial development are possible — high skills or low wages — depending on the willingness or reluctance of state governments to invest in human capital.¹³ It cannot be emphasized enough that the high-skills option of postindustrial development is a high social investment option that relies heavily on broad access to public higher education. Without an aggressive social investment strategy, state and national governments will pursue the low-wage option by default.

In this respect, state investment in *public* higher education is particularly necessary if Massachusetts is to avoid what the Saxon report calls an “opportunity crisis” for the state's citizens.¹⁴ Historically, Massachusetts policymakers have justified low rates of social investment in human capital on the premise that Massachusetts's large number of private higher institutions could fill most of the commonwealth's economic, civic, and cultural needs. However, that strategy and its initial premise are no longer valid for three reasons. First, at a time the state's needs for a highly educated population are increasing, enrollments at Massachusetts private institutions have been stable or shrinking. Meanwhile, state budget cuts are forcing public institutions to turn away qualified applicants for admission.¹⁵ Second, whereas a high-skills development option places a premium on *accessibility* to postsecondary education, pricing policies at private institutions necessarily emphasize exclusivity and low accessibility. It therefore comes as no surprise that a 1990 report to the state college presidents found that “private institutions do not provide the necessary access to the large majority of qualified low income students of the Commonwealth.”¹⁶ Finally, there has been a strange reluctance on the part of Massachusetts policymakers to recognize that the focus of the commonwealth's private institutions often lies beyond the borders of Massachusetts. As the Saxon report concluded, many of the state's private institutions “are not ‘Massachusetts’ universities in any but the geographic sense.”¹⁷ This ought to be driven home by the fact that nearly 60 percent of *Massachusetts residents* entering college each year attend the commonwealth's public colleges and universities.¹⁸

If there is to be linkage between a postindustrial development strategy and personal income growth for the average citizen, it will be forged mainly through social investment in the commonwealth's twenty-nine public colleges and universities. Moreover, the returns on social investment in human capital have been extensively documented, particularly in terms of the positive correlation between higher educational attainment and personal income. As an illustration, U.S. Census Bureau data reveals that, from 1978 to 1988, on average, white males with one to three years of college earned 12 percent more than white males with only four years of high school, while white males with four years or

more of college earned an average of 41 percent more than high school graduates. The differential between high school graduates and those who have attended college is even more pronounced for women and African-Americans.¹⁹ Thus, given the current income differentials, the average college graduate can reasonably expect to earn \$646,000 more in real lifetime income than the average high school graduate. (See Table 1 and Appendix A, equations 1-3.) In economic terms, this means that a four-year college or university education accounts for \$646,000 in direct value added to each unit of human capital produced in a U.S. college or university.

On the other hand, the average total unit cost of producing one student with a college or university education is presently about \$33,335 (see Appendix A, equation 1). Consequently, in producing one unit of "enhanced human capital" — a college graduate — the ratio of costs to value added is currently 1:19 in real constant dollars. In other words, each dollar invested in higher education results directly in the addition of nineteen dollars to the lifetime personal income of each college or university graduate. Viewed a bit differently, every dollar invested in higher education by U.S. state governments today will yield a dividend of twenty-four cents in gross state income each year for approximately the next forty years.²⁰ This return may be conceptualized as an annual "social dividend" of 24 percent realized each year for forty years on every state dollar invested in higher education.

Further, if one assumes that each college graduate returns 6 percent of this value added to the public in the form of state taxes and fees, it follows that the average college and university graduate will return an additional \$38,760 to the state treasury over and beyond what that person, lacking a higher education, would have paid to the state.²¹ The net result is that the state's investment in higher education will directly realize a real "social profit" of \$22,092 in the form of enhanced state tax revenue and fees on each individual who receives a college education (see Appendix A, equation 5).²² This figure translates into a real return of 133 percent over the working lifetime of each college-educated individual. For analytical purposes, if state spending on higher education is regarded as a public loan repaid in the form of enhanced tax revenue, the annual *real return* to the state is approximately 3 percent per annum over forty years, an "interest rate" equivalent to the real return on a 1991 money market account. On these terms, public institutions of higher education can be viewed as reasonably profitable public enterprises that yield direct returns to the state comparable to those of many private-sector service industries.

Table 1

Projected Lifetime Income of U.S. Households by Educational Attainment

Education Level	Median Salary*	Projected 40-Year Lifetime Income**
Elementary school	\$11,730	\$ 469,200
High school	23,383	1,425,254
College	38,337	2,071,591

*1987 figures

** Assumes constant 2 percent annual real growth in personal income from 1987 median base.

Source: U.S. Census Bureau, *Statistical Abstract of the United States, 1989* (Washington, D.C.: GPO, 1989), 441.

It is important to recognize that the economic benefits of public investment in higher education generally accrue to the state which makes the investment. National measurements of student migration indicate that 85 percent of all students attending U.S. higher institutions resided in the state where they attended a college or university (see Table 2). In addition, 85 percent of those residents remained in the state following graduation.

Overall, Massachusetts student migration is somewhat higher than the national average. Nevertheless, 71 percent of all students in Massachusetts higher institutions — public and private — are state residents prior to their enrollment. This figure deviates from the national average mainly because the ninety well-known private institutions in Massachusetts draw on a national and international student pool. In this respect, the higher levels of student migration to Massachusetts ought to be viewed as the positive indicator of an educational export industry that provides significant employment and revenues in the private sector.²³ It should also be noted that this state compares favorably with the national average in its ability to retain college-educated residents, with 81 percent of them remaining in Massachusetts after they graduate from a higher institution. This figure is slightly larger when one includes persons who live in other New England states but continue to work and pay taxes in Massachusetts.²⁴

Table 2

**Student Migration in Higher Education:
Selected Industrial States, 1986 ***

	Ratio of students remaining in state to	
	Total Students Enrolled (percentage)	Resident Students Enrolled** (percentage)
United States	85	85
Michigan	93	92
California	92	95
Texas	91	94
New Jersey	90	64
Washington	89	92
Illinois	88	85
Ohio	87	86
Wisconsin	86	88
New York	86	83
Minnesota	84	81
Florida	83	83
North Carolina	81	93
Connecticut	81	68
Alabama	80	90
Pennsylvania	80	82
Virginia	75	75
Massachusetts	71	81

*Includes public and private institutions of higher education.

**Percentage of students who are state residents at matriculation and remain in the state following graduation.

Source: U.S. Department of Education, *Digest of Education Statistics, 1988* (Washington, D.C.: GPO, 1988), 166.

Table 3

**Revenue per FTE Student
in Public Higher Education:
Selected Industrial and High Technology States,*
1985-1986****
(Dollars)

	Total FTE Enrollment	Current Fund Revenue***	Revenue per FTE
United States	6,613,813	\$52,581,968,000	\$7,950
Virginia	168,434	1,408,347,000	8,383
Michigan	295,329	2,345,154,000	8,376
Minnesota	128,675	1,069,287,000	8,289
California	891,025	7,364,946,000	8,266
Texas	486,874	4,004,591,000	8,223
New York	412,852	3,382,324,000	8,190
Washington	146,359	1,195,471,000	8,188
North Carolina	194,812	1,577,753,000	8,091
Pennsylvania	233,107	1,868,192,000	8,018
Wisconsin	181,298	1,449,889,000	8,010
Alabama	131,021	1,045,957,000	7,984
New Jersey	156,506	1,232,014,000	7,847
Ohio	280,357	2,192,819,000	7,832
Florida	234,729	1,655,245,000	7,044
Connecticut	63,207	438,822,000	6,965
Massachusetts	128,293	878,621,000	6,864
Illinois	325,516	2,183,184,000	6,697

*States maintain a public higher education system similar to that of Massachusetts. Each system consists of at least one flagship research university supported by branch campuses that operate as autonomous and comprehensive regional universities. A network of four-year state colleges and two-year community colleges complete the three-tier structure of each system.

**Most recent data available for national comparison.

***Total revenue from all sources including tuition and fees, federal government, state and local government, private gifts and benefactions, endowment income, sales and services, and other miscellaneous income.

Source: National Center for Education Statistics, *State Higher Education Profiles: 1988* (Washington, D.C.: GPO, 1988).

The Political Economy of Social Disinvestment

The Saxon commission accurately concluded that "unlike the leading industrial nations, and alone among the industrial states, Massachusetts has failed to recognize that its system of public education is one of the keys to continued [economic] strength" and general prosperity.²⁵ All political rhetoric to the contrary, the public higher education systems recognized for research and teaching excellence are also among the best funded in the nation as subsequent comparisons will demonstrate. On the other hand, comparative funding data reveals that aggregate revenues and expenditures by Massachusetts public institutions are at best mediocre when measured against national averages. Perhaps more revealing of Massachusetts's faltering position in public higher education is that it generally ranks near the bottom when compared to the sixteen industrial and high technology states generally regarded as its major competitors.

Current Revenue per FTE Student

The most recent national data (1985-1986) shows that current revenue per full-time equivalent (FTE) student averaged \$7,950 for public higher institutions. In Massachu-

Table 4

**Expenditures per FTE Student
in Public Higher Education:
Selected Industrial and High Technology States,
1985–1986**
(Dollars)

	Total FTE Enrollment	Current Fund Expenditures	Expenditures per FTE
United States	6,613,813	\$50,074,768,000	\$7,571
Wisconsin	181,298	1,438,918,000	7,950
Minnesota	128,675	1,023,324,000	7,933
California	891,025	7,049,635,000	7,912
New York	412,852	3,238,773,000	7,842
North Carolina	194,812	1,527,535,000	7,834
Washington	146,359	1,143,284,000	7,831
Pennsylvania	233,107	1,814,384,000	7,787
Michigan	295,329	2,278,217,000	7,723
Texas	486,874	3,674,109,000	7,544
Alabama	131,021	979,770,000	7,479
Virginia	168,434	1,241,534,000	7,390
New Jersey	156,506	1,140,310,000	7,263
Ohio	280,357	2,019,351,000	7,212
Connecticut	63,207	439,397,000	6,975
Florida	234,729	1,638,227,000	6,971
Illinois	325,516	2,152,955,000	6,604
Massachusetts	128,293	779,340,000	6,089

Source: National Center for Education Statistics, *State Higher Education Profiles: 1988* (Washington, D.C.: GPO, 1988).

sets, during the same period, current revenue per FTE student was \$6,864, or approximately 14 percent below the national average. Among the seventeen largest industrial and high technology states, Massachusetts ranked sixteenth in current revenue per FTE student (see Table 3).

Expenditures per FTE Student

Similarly, the most recent national data (1985–1986) shows that expenditures per FTE student averaged \$7,571 for public higher institutions. Massachusetts expenditures during the same period were \$6,089, or approximately 20 percent below the national average. Massachusetts ranked seventeenth among the seventeen largest industrial and high technology states (see Table 4).

Likewise, Massachusetts lags far behind most industrial and high technology states in expenditures per FTE student by the flagship university in its public system. In the seventeen industrial and high technology states, flagship campus expenditures per FTE student range from a high of \$33,774 at the University of California at Los Angeles (UCLA) to a low of \$11,032 at Rutgers University in New Jersey (see Table 5). The median flagship expenditure in this sample was \$16,529. The University of Massachusetts at Amherst expenditures were near the low end of the sample at \$11,924. Moreover, the University of Massachusetts at Amherst spent approximately 28 percent less per FTE student than the median expenditure for competing flagship campuses in other major systems of public higher education.

Table 5

**Expenditures per FTE Student
by Public System Flagship Campuses:
Selected Industrial and High Technology States,
Fall 1985**

University	FTE Enrollment	Current Fund Expenditures	Expenditures per FTE
California — Los Angeles	33,064	\$1,114,534,000	\$33,774
Michigan	32,172	985,846,000	30,807
North Carolina — Chapel Hill	20,243	492,827,000	24,641
Washington	30,072	662,739,000	22,091
California — Berkeley	29,745	616,429,000	20,547
Minnesota — Minneapolis—St. Paul	45,664	889,386,000	19,335
Wisconsin — Madison	40,506	768,125,000	18,735
Illinois — Urbana	34,410	588,436,000	17,307
Ohio State — main campus	47,081	781,204,000	16,621
Texas A&M	33,229	542,434,000	16,437
Florida	32,367	504,382,000	15,762
Pennsylvania State — main campus	33,120	501,614,000	15,200
Michigan State	38,051	503,483,000	13,250
Texas — Austin	44,457	537,027,000	11,934
Massachusetts — Amherst	24,098	286,173,000	11,924
Connecticut	18,570	213,026,000	11,212
New York — Buffalo	18,505	212,339,000	11,176
Rutgers	27,239	297,869,000	11,032

Source: U.S. Department of Education, *Digest of Education Statistics, 1988* (Washington, D.C.: GPO, 1988), 162–165.

Table 6

**Sources of Current Fund Revenue
for U.S. Public Higher Education**

Source	U.S. Percentage*	Massachusetts Percentage*			
	1986	1986	1988	1989	1990
Tuition and fees from students	18.0	17.1	16.8	19.1	24.1
Federal government	11.1	9.5	11.3	10.3	12.9
State/local government	60.0	63.8	61.1	58.5	47.5
Private gifts and grants	4.0	2.5	3.2	3.5	4.3
Endowment income	0.8	0.0	0.1	0.0**	0.1
Sales/services/other	6.2	6.9	7.6	8.6	11.1

*Figures are not strictly comparable because the Massachusetts data includes state appropriations for students attending private higher institutions. Thus, the state share of funding for public institutions alone is actually in the low fifties (percentage), while the share of revenues provided by student tuition and fees is several percentage points higher than shown here.

**The exact figure for endowment income is 0.043 percent.

Sources: U.S.: National Center for Education Statistics, *State Higher Education Profiles: 1988* (Washington, D.C.: GPO, 1988); Massachusetts: calculated from data provided by the Board of Regents.

The impact of this underinvestment on the flagship campus is evident when one notes that of the seventeen systems compared in this study, every state except Alabama and Massachusetts has at least one public university classified Research University I (the top ranking) by the Carnegie Foundation for the Advancement of Teaching.²⁶ Eight states have

Table 7

**Institutions Classified Research University I:
Selected Industrial and High Technology States,
1990**

State	Public RU I's (Number)	Private RU I's (Institution)
California	6	California Institute of Technology Stanford University University of Southern California
Connecticut	1	Yale University
Florida	2	University of Miami
Illinois	2	Northwestern University University of Chicago
Massachusetts	0	Boston University Harvard University Massachusetts Institute of Technology
New York	1	Columbia University Cornell University New York University Rockefeller University University of Rochester Yeshiva University
New Jersey	1	Princeton University
North Carolina	2	Duke University
Ohio	2	Case Western Reserve
Pennsylvania	2	Carnegie-Mellon University University of Pennsylvania

Source: *Chronicle of Higher Education Almanac*, September 5, 1990, 28.

two public institutions classified RU I,²⁷ while six of the nine University of California campuses are classified RU I.

**The Purpose of Public Higher Education:
Quality and Access**

When he was chancellor of the Massachusetts Board of Regents, Franklyn Jennifer observed that the fundamental dilemma of public higher education is how to balance “the interrelated goals of excellence and access.”²⁸ The correlation between educational excellence and expenditure levels by higher institutions is undeniable. Excellence is certainly not guaranteed by generous revenues, but without adequate revenues the call for excellence is merely a deceptive buzzword. Yet if excellence is a function of revenue levels, access is a function of the distribution of the financial burden of excellence among different revenue streams.

U.S. public higher institutions rely on six revenue streams. The core streams — state government appropriations, student tuition and fees, and sales and services by auxiliary enterprises — generate 84 percent of all operating revenues for public higher institutions (see Table 6). In financially healthy systems, the margin for excellence is provided by

Table 8

State and Local Appropriations for Public Higher Education per FTE Student: Selected Industrial States, 1985–1986

	Total FTE Enrollment	State/Local Appropriations (Dollars)	Appropriation per FTE Student
United States	6,613,813	\$30,234,463,000	\$4,570
New York	412,852	2,293,216,000	5,553
Florida	234,729	1,259,697,000	5,360
North Carolina	194,812	1,028,695,000	5,275
California	891,025	4,632,551,000	5,199
Texas	486,874	2,394,745,000	4,917
Alabama	131,021	630,712,000	4,815
New Jersey	156,506	750,297,000	4,779
Virginia	168,434	739,382,000	4,401
Massachusetts	128,293	534,202,000	4,174
Connecticut	63,207	259,783,000	4,124
Washington	146,359	589,367,000	4,037
Wisconsin	181,298	720,595,000	3,981
Illinois	325,516	1,259,697,000	3,864
Ohio	280,357	1,072,288,000	3,830
Minnesota	128,675	490,803,000	3,805
Michigan	295,329	1,095,187,000	3,713
Pennsylvania	233,107	786,509,000	3,376

Source: National Center for Education Statistics, *State Higher Education Profiles: 1988* (Washington, D.C.: GPO, 1988).

three supplementary revenue streams — federal grants and appropriations, private gifts, and endowment income.

A major difference between the public and private sectors of higher education is the financial structure of the core revenue streams that support educational and general expenditures. Because, on average, private institutions derive 52 percent of their current revenues from student tuition and fees, they must thus adopt pricing policies that make them inaccessible to most students.²⁹ Since accessibility is largely a function of pricing, the core financial structure of public higher education systems is largely dictated by the need to maintain low student tuition and fees. Consequently, on average, U.S. public institutions derive only 18 percent of their current revenues from student tuition and fees. Therefore, excellence in the public sector has typically been a function of state appropriations which average about 60 percent of U.S. public institutions' current revenues (see Table 6).

In this respect, the underlying philosophy of the best public systems is that the state is obliged to maintain at least one flagship campus to give students, regardless of economic and social background, access to a higher education comparable in quality to the best in the nation. Similarly, state colleges are funded at levels sufficient to allow them to compete in quality with average private liberal arts colleges and technical institutes. Hence, rather than being viewed as a substitute for public funding, private-sector institutions are used as yardsticks for ascertaining what state government must provide to maintain accessible public institutions of the best quality. On this point, it is worth noting that only in Massachusetts has the existence of prestigious private institutions ever been used as a policy rationale for underfunding public higher education. The fact is that nine of the

Table 9

Tuition and Fee Charges at Public Higher Institutions: Comparison of Massachusetts to the National Average, 1990–1991

	National Average	Massachusetts Average
2-year public	\$ 904	\$1,502
4-year public	1,755	2,581

Note: Both sets of figures are unweighted averages that reflect the behavior of the average institution in setting prices. Thus, figures from each institution are weighted equally in computing these averages and are not adjusted for enrollment.

Sources: National average: College Board, College Scholarship Service, 1990–91 *College Costs: Average Fixed Charges and Student Expenses*, vol. 2, no. 2, November 1990, 2; Massachusetts average: calculated from data supplied by the Board of Regents (figures include spring 1991 fee increases).

Table 10

Ranges of Tuition and Fees: Four-Year Public Colleges and Universities, 1990–1991

Range of Tuition and Fees	Percentage of Institutions (National)	Percentage of Institutions (Massachusetts)
Less than \$500	2.0	0.0
\$500–999	8.0	0.0
\$1,000–1,499	30.0	0.0
\$1,500–1,999	32.0	7.7
\$2,000–2,999	22.8	69.2
\$3,000 or more	5.2	15.4

Sources: National figures: College Board, College Scholarship Service, 1990–91 *College Costs: Average Fixed Charges and Student Expenses*, vol. 2, no. 2, November 1990, 3; Massachusetts figures: calculated from data supplied by the Board of Regents (figures include spring 1991 fee increases).

sixteen states compared to Massachusetts in this study also have at least one private university classified RU I; Illinois and Pennsylvania each have two private RU I's, California has three, and New York tops the list with six (see Table 7).

The Core Revenue Streams

State Appropriations

In terms of nominal appropriations per FTE student, Massachusetts ranked in the low middle of the fifty states in fiscal 1986. While state appropriations to public higher education averaged \$4,570 per FTE student nationwide that year, Massachusetts appropriated \$4,174 or 8.7 percent below the national average (see Table 8). On a relative basis, Massachusetts ranked ninth among the seventeen major industrial and high technology states and thirty-third in the nation in appropriations per FTE student.

The generous increases in initial appropriations for fiscal years 1987 and 1988 were sufficient to raise the commonwealth's per capita appropriation to twentieth in the nation in 1988.³⁰ The dramatic relative improvement of the system's funding during these two

Table 11

Percentage of Public Higher Education Current Fund Revenue Provided by State and Local Government Appropriations: Selected Industrial and High Technology States, 1985–1986

State/Local	Current Fund Revenue	State/Local Appropriations	Percentage
United States	\$52,581,968,000	\$30,234,463,000	57.5
New York	3,382,324,000	2,293,216,000	67.8
North Carolina	1,577,753,000	1,028,695,000	65.2
California	7,364,946,000	4,632,551,000	62.9
New Jersey	1,232,014,000	750,297,000	60.9
Massachusetts	878,621,000	534,202,000	60.8
Alabama	1,045,957,000	630,712,000	60.3
Texas	4,004,591,000	2,394,745,000	59.8
Connecticut	438,822,000	259,783,000	59.2
Illinois	2,183,184,000	1,259,697,000	57.7
Florida	2,183,184,000	1,259,697,000	57.7
Virginia	1,408,347,000	739,382,000	52.5
Wisconsin	1,449,889,000	720,595,000	49.7
Washington	1,195,471,000	589,367,000	49.3
Ohio	2,192,819,000	1,072,288,000	48.9
Michigan	2,345,154,000	1,095,187,000	46.7
Minnesota	1,069,287,000	490,803,000	45.9
Pennsylvania	1,868,192,000	786,509,000	42.1

Source: State/local appropriations: National Center for Education Statistics, *State Higher Education Profiles: 1988* (Washington, D.C.: GPO, 1988).

years resulted in widespread pronouncements by the state's leading educators that the Massachusetts public higher education system was poised to become one of the ten best in the nation by the year 2000.³¹ However, following the reversions of the last three fiscal years, the commonwealth's appropriations per FTE student have fallen to \$4,103, a nominal reduction of 1.7 percent and a real reduction (after inflation) of 19.7 percent below 1986 levels.

Student Tuition and Fees

Although state support for the commonwealth's public institutions has historically been below the national average, its public institutions have been highly accessible in terms of student costs. In fiscal 1986, tuition and fees at the commonwealth's public institutions were 19 percent below the national average and ranked thirty-eighth lowest in the nation.³² In fact, as was noted in a task force report of the Massachusetts Business Roundtable, "Tuition and fees in Massachusetts began the decade at relatively low levels and until 1988 maintained that status in spite of increases."³³ Indeed, the rate of increase in average tuition and fees consistently lagged growth in the state's average per capita income, a key aggregate measure of students' ability to pay. Average tuition and fees increased by 42 percent from fiscal years 1982 through 1988, while per capita income in Massachusetts increased by 56 percent during the same period. Thus, by fiscal 1989, some upward adjustment in student tuition and fees was justified and could be undertaken without imperiling the accessibility of public higher institutions. The upward adjustments for 1989

brought the state's tuition and fees roughly into line with national averages, while the impact of the increase on accessibility was offset by large increases in the state's scholarship reserve account.

However, two factors radically altered this picture during fiscal years 1990 and 1991. First, as part of the reversion process, the state's scholarship reserve account has been cut by \$30 million or 36 percent from its 1988 peak funding level. Second, additional increases in the average tuition and fee schedule have far exceeded inflation and personal income growth during the last two years. Tuition increased a systemwide average of 50 percent from fiscal years 1988 to 1991, while systemwide mandatory fees increased an average of 100 percent during the same period. As a consequence, the state's colleges and universities are now among the most expensive public institutions in the United States (see Table 9 and Table 10).

In 1990–1991, the nationwide average tuition and mandatory fee charge at four-year public institutions was \$1,755. In Massachusetts, the comparable charge was \$2,581, or 47 percent above the national average. Likewise, the nationwide average tuition and mandatory fee charge at two-year public colleges was \$904. In Massachusetts, the comparative charge was \$1,502, or 66 percent above the national average. The net result is that both University of Massachusetts campuses are among the top 5 percent in terms of student cost at public institutions in the nation; at the same time the state's four-year institutions combined rank among the upper quartile and its two-year colleges rank among the upper quintile nationally in terms of average costs.

Thus, the comparative data indicates that the state's public colleges and universities have moved near the top of their competitive price range. Any further substantial increases in tuition or fees will clearly overprice these institutions. In addition, the New England Economic Project estimates that personal income growth in Massachusetts will lag the national average at only 1.9 percent in 1991 and 2.5 percent in 1992.³⁴ Hence, the state's public institutions will encounter further short-term constraints on their ability to increase tuition and fees due to slowing personal income growth in Massachusetts.

The pattern of declining state support for public higher institutions, when combined with rising tuition and fees, is reaching a point where it constitutes a de facto policy of privatization. In fiscal 1986, for instance, state and local government provided 63.8 percent of current revenues for the commonwealth's public colleges and universities, a figure slightly above the national average of 60 percent (see Table 6 and Table 11).

However, as Table 6 indicates, the percentage of current fund revenues provided by state appropriations in Massachusetts has steadily slipped from the high mark represented by the 1986 figure. Following the 1989 reversion, state and local funds accounted for 58.5 percent of current fund revenues. After the 1990 reversions, state and local funds fell to only 47.5 percent of current fund revenues. Comprehensive systemwide financial data for 1991 was not available at the time of writing, but there have been five additional legislative cuts and executive reversions with the result that 1991 state appropriations and state grants will most likely have fallen to 40 percent or less of current fund revenues. On the other side of the equation, student tuition and fees rose from 17.1 percent of current fund revenues in 1986 to 24.1 percent in 1990 and have certainly risen to at least 27 percent in the last fiscal year.

While such developments might be written off entirely to the state's short-term fiscal crisis, regressive "burden-shifting" has emerged simultaneously as a key element in the Board of Regents' long-term planning strategy. Heeding the recommendations of the

former chancellor, Franklyn Jennifer, and of the 1990 Tuition Advisory Panel, the Board of Regents adopted a planning goal of students' tuition and fees covering 35 percent of the actual costs of public higher education.³⁵ This objective has also been embraced by the Weld administration.³⁶ By comparison, public colleges and universities nationwide derive an average of only 18 percent of current fund revenues from tuition and fees.³⁷

Although the Regents' stated policy objective is to stabilize funding, secure excellence, and maximize system autonomy, by shifting the system's core revenue streams away from state appropriations onto student tuition and fees, the Regents and the legislature are creating a financial structure for the public institutions equivalent to that of many private "state-assisted" institutions.³⁸ Thus, unless the Regents and the legislature intend to privatize the state's twenty-nine institutions, the 1990 report on the state colleges of Massachusetts (SCOM) is quite correct in its conclusion that "the 35% figure recommended by the Regents Tuition Review Panel is an inappropriate benchmark by which to gauge individual student support for the cost of public higher education."³⁹

Sales and Services

Sales and services constitute the third core revenue stream. These are generally administered through such nonprofit auxiliary enterprises as bookstores, dormitories, and cafeterias. The operational objective of auxiliary enterprises at both public and private institutions is to be financially self-sustaining, while providing educational materials (for example, textbooks) and educational services (room and board, health care) to students at the lowest cost possible. Nationwide, auxiliary services account for 6.2 percent of current fund revenues at public colleges and universities (see Table 6). In fiscal 1986, the commonwealth's public institutions derived 6.9 percent of their current fund revenue from this source, a figure that was already slightly above the national average.

To compensate for declining state funding, college and university administrators have increasingly looked toward enhancing core revenue from auxiliary services by raising prices. Thus, by fiscal 1989, the commonwealth's public institutions were deriving 8.6 percent of their current fund revenues from auxiliary services; by 1990 that figure had risen to 11.1 percent. But because such enterprises primarily serve students, the emerging pressure to operate auxiliary enterprises "for profit" in Massachusetts constitutes little more than a hidden fee increase that accelerates the current pattern of privatization.

The Supplementary Revenue Streams

Federal Grants and Appropriations

Federal assistance to higher education falls mainly into three categories: general appropriations in support of land-grant, sea-grant, and space-grant universities, need-based student financial aid, and competitive awards to support ongoing research projects. Nationwide, public colleges and universities derive 11.1 percent of current fund revenues from all federal sources. By comparison, the commonwealth's public institutions derived 9.5 percent of revenue from federal sources in 1986, 11.3 percent in 1988, 10.3 percent in 1989, and 12.9 percent in 1990 (see Table 6).

Massachusetts compares favorably to national averages, particularly in its receipt of federal appropriations and need-based student financial aid.⁴⁰ The state consistently underperforms in the area of competitive research grants and awards to faculty. At public institutions nationwide, competitive grants and awards averaged \$18,067 per FTE faculty

in fiscal 1986. The commonwealth's public institutions generated only \$9,669 per FTE faculty in federal grants and contracts, a figure that was 46 percent below the national average and ranked Massachusetts as forty-sixth in the nation.

However, this performance is itself derivative of unpredictable and insufficient state appropriations. Major federal grants and contracts are typically awarded to scholars at institutions willing to provide matching funds, seed money, release time, support staff, research assistants, and adequate research facilities. For example, in recently deciding to locate a new \$61 million high-field magnetic research laboratory at Florida State University instead of at MIT, the National Science Board cited FSU's "level of commitment" as the determining factor. It especially pointed to FSU's willingness to pledge twenty new permanent faculty spots, twenty visiting faculty positions, and ten technicians to the laboratory.⁴¹ Without equal levels of stable financial commitment, scholars at the commonwealth's public institutions will necessarily be at a competitive disadvantage in securing federal grants.

Private Gifts and Grants

Private gifts and grants provide about 4 percent of current fund revenues at public institutions in the United States. The comparable figure for Massachusetts was 2.5 percent in fiscal 1986 (see Table 6). Since that time, the state's public institutions have steadily increased their private revenue stream to 3.2 percent in 1988, 3.5 percent in 1989, and 4.3 percent in 1990. Nevertheless, following the lead of an October 1990 report of the Senate Post-Audit Committee, the Board of Regents has recommended that the state's twenty-nine public campuses further increase their private fund-raising capabilities. Regent Paul S. Doherty suggests that in the Regents' view, such a policy would help public institutions withstand fluctuations in state funding.⁴²

The most recent data indicates that Massachusetts public institutions are already doing a fairly good job of attracting private benefactions, particularly for annual funds. However, the view that private gifts and grants can in any way compensate for inadequate state funding is woefully misinformed. Massachusetts continues to bring its private fund-raising into line with national averages, but the additional funds have been sufficient to erase the impact of only one of the last nine cuts and reversions in state appropriations. Such a view ignores the reality that private fund-raising at public institutions typically relies on professional and support staff which are funded by state appropriations and have been reduced or eliminated due to reduced state appropriations in Massachusetts.

Endowment Income

As the final supplementary revenue stream, endowment income supplies an average of 0.8 percent of current fund revenues at U.S. public institutions (see Table 6). The comparable figure for Massachusetts has been less than 0.1 percent. In this respect, the October 1990 report of the Senate Post-Audit Committee accurately noted that Massachusetts public higher institutions lag well below the national average in endowment building and income.⁴³ However, the Senate report and the Board of Regents again miss the mark with their conclusion that larger endowments would make the public system less vulnerable to cutbacks in state assistance. Even if the commonwealth's public institutions successfully built endowments to double the national average (to 1.6 percent), such income would have been insufficient to cover even the last of the nine cuts and reversions experienced over the last three fiscal years. The reality of public higher education is that endowments and

Table 12

**Projected Maintenance Budget for Massachusetts
Public Higher Education: Required Real Spending by
State and Local Government for Direct
Appropriations to Twenty-nine Campuses,
1986–1991 ***

Fiscal Year	CPI (percent)	Inflation Index	Maintenance Budget** (millions)	Actual Expenditures (millions)	Increase/Shortfall (percent)
1986	1.9	100.0	\$525.9	\$525.9	0
1987	3.6	101.9	535.9	545.8	+ 1.9
1988	3.9	105.6	555.2	635.6	+ 14.5
1989	4.6	109.7	576.8	616.7	+ 6.9
1990	6.1	114.8	603.3	583.5	- 3.3
1991	3.7	121.8	640.1	526.5	- 17.8
1992	—	126.3	663.7	468.0	- 29.5

*Direct appropriations to the twenty-nine public campuses for operating expenses. Does not include scholarship reserves, educational resource materials, subsidies to private institutions, Board of Regents accounts, or other miscellaneous expenditures.

**Projects the nominal spending necessary to maintain a “flat budget” in “real” dollars. The projected appropriations also assume stable enrollments during the five-year period.

Sources: CPI: U.S. Census Bureau, *Statistical Abstract of the United States, 1989* (Washington, D.C.: GPO, 1989), 463 (1991 figure is an annualized projection of the October/November inflation rate); actual expenditures: *The CLT Petition (Question 3) and Higher Education: An Informational Report Prepared by the Board of Regents*, October 1990, 7 (figures include all reversions of previously appropriated funds through September 1990; 1992 figure proposed by Governor William Weld).

private gifts can supply a “margin of excellence” that turn good institutions into excellent ones, and excellent ones into world-class universities, but under no circumstances can they ever substitute for state appropriations to fund the normal operating expenses of public institutions.

Two Policy Options: Privatization or Public Funding?

The ongoing debate over the Massachusetts fiscal crisis can be resolved into two policy options when one turns to the specific question of funding for public higher education. The current policy, initiated in fiscal 1988, is to shift the core revenue stream from state appropriations to a combination of tuition and fees, private gifts, and endowment income. Should this policy be carried through to its conclusion, the existing public colleges and universities will be forced to rely on a financial structure that is more appropriate to private institutions. In this sense, the state legislature is pursuing privatization by default, while the Board of Regents is apparently pursuing privatization by design. This option makes it inevitable that educators will be forced to choose between excellence or accessibility, and under either scenario a majority of the state’s college and university students will be the losers.

However, if the current policy is to be reversed, it requires at minimum a commitment by the commonwealth to restore state funding to real fiscal 1986 levels. As indicated above, funding levels for public higher education in Massachusetts have been adequate to maintain satisfactory institutions of average quality compared to national standards. Nevertheless, as the data indicates, even this modest policy objective has been abandoned for the present time. For example, the comparative data discussed previously shows that

Massachusetts was average to slightly below average in its support for public higher education during 1986.

For analytical purposes, therefore, one can regard the 1986 appropriation as the most recent baseline for measuring the amount the state must appropriate to maintain average funding for its higher institutions. Maintaining this historical funding average during fiscal 1991 would have required direct state appropriations to the twenty-nine campuses of \$640.1 million (see Table 12). Yet the actual appropriation for 1991 was only \$526.4 million, or 17.8 percent below the nominal appropriation necessary to maintain a real-dollar, flat budget. Restoring the real funding levels of 1986 would require a nominal fiscal 1992 appropriation of \$663.7 million. This would require an increase of \$137.2 million over the actual 1991 appropriation. It should be noted that this figure is for direct appropriations to the public campuses only and does not include funds for the state scholarship reserve, subsidies to private institutions, educational resource materials, and Regents accounts. A total higher education appropriation of \$745.3 million would be required in 1992 to restore real funding to 1986 levels when one includes these expenses (see Table 14).

It is important to realize that even a successful maintenance strategy of the type suggested by a \$663.7 million 1992 appropriation would not keep Massachusetts from falling further behind its major competitors in other states. In the national context, other large industrial states — even those with fiscal shortfalls of their own — have not pursued maintenance strategies in higher education expenditures. During 1989 and 1990, the last two fiscal years in which comprehensive data is available, every state except Massachusetts increased its appropriations for higher education operating expenses. During this same biennial period, thirty-one states increased higher education appropriations by at least 14 percent, a rate well in excess of inflation, while Massachusetts reduced its appropriation for higher education's operating expenses by 9 percent (see Table 13). So even if Massachusetts were to restore the real spending levels of 1986, the state would continue to fall further behind the other industrial and high technology states, which are increasing real spending on higher education.

The Price of Excellence

Another level on which public higher education finance must be addressed is the question of whether an average higher education system is good enough to compete economically in those areas targeted by the commonwealth. As Massachusetts comes to rely for its prosperity more and more on a postindustrial economy that is higher education intensive, average financial support for an average public higher education system will no longer be adequate to sustain the state's competitive position. This conclusion was put forward succinctly in a January 1991 report by the Regents Task Force on Administrative Organization, whose members consisted chiefly of leading Massachusetts business executives: "The quality of public higher education must be competitive with that of private higher education, and that quality must never be compromised in an attempt, however well-intentioned, to save taxpayers' money."⁴⁴

The same view has been echoed consistently by the state's educational leaders. Franklyn Jennifer insisted throughout his tenure that "our goal must be a system of public higher education that is acknowledged to be among the finest in the nation."⁴⁵ Similarly, Regents chairman Paul Tsongas has persistently warned state leaders that Massachusetts

Table 13

State Spending for Higher Education Operating Expenses: Two-year Change for Selected Industrial and High Technology States, 1988–1990

State	Percent Change
Illinois	+26
Virginia	+21
Texas	+18
Washington	+17
Alabama	+16
Minnesota	+16
Pennsylvania	+16
Florida	+15
North Carolina	+14
California	+13
Wisconsin	+13
Ohio	+13
New Jersey	+12
Connecticut	+12
New York	+11
Michigan	+8
Massachusetts	-9

Note: The percentages assume a flat fiscal 1992 budget of \$13.1 billion. If total spending is scaled back to \$12.3 billion, as proposed by Governor William Weld, the average higher education budget would be 6.1 percent of total state spending, while the world-class budget would be 7.2 percent of total state spending.

Source: *Chronicle of Higher Education Almanac*, September 5, 1990, 29–87.

Table 14

Spending Necessary for Average and World-class Public Higher Education Systems in Massachusetts
(1992 Dollars)

Line Item	Average (millions)	World-class (millions)
Operating Expenses	\$663.7	\$780.0
Scholarship Reserve	56.5	56.5
Educational Resource Materials	9.6	38.5
Tufts Veterinary School	4.8	4.8
Regents Account/Miscellaneous	10.7	10.7
Total Appropriation	\$745.3	\$890.5
Percentage of State Budget*	5.6	6.8

*The percentages assume a flat fiscal 1992 budget of \$13.1 billion. If total spending is scaled back to \$12.3 billion, as proposed by Governor William Weld, the average higher education budget would be 6.1 percent of total state spending, while the world-class budget would be 7.2 percent of total state spending.

must build one of the best public higher education systems in the United States by the year 2000.⁴⁶ As noted by the members of the Saxon commission, the centerpiece of this larger goal must entail the creation of a world-class public university in Massachusetts.

Until 1988 the state had made substantial progress toward this goal and was truly poised for a final push into the upper echelons of great public higher education systems. It is easy for education leaders and elected officials to invoke rhetoric of this ideal, but no public

official should underestimate the enormity of that task or ignore the immense damage to the system incurred during the last three fiscal years. For as the 1990 SCOM report observed, the great public university systems such as those of California, Wisconsin, and Minnesota are “literally nurtured and supported by *public funds*.”⁴⁷ (Emphasis added.)

Appendix B offers a model for projecting the state spending necessary to create a world-class public university and make the overall public system one of the best in the nation. The eleven states were selected because each has two or more Research University I public campuses and thus supplies comparable models to a hypothetical world-class Massachusetts system with two research universities (UMass/Amherst and UMass/Boston). Appendix B yields an enrollment-weighted average current revenue figure of \$10,263 per FTE student for fiscal 1992. The most conservative U.S. Department of Education projection is that FTE enrollment will decline slightly during the middle of the 1990s and return to previous levels by the end of the decade.⁴⁸ Therefore, assuming stable FTE enrollments of 113,000, Massachusetts public colleges and universities would have to generate total current revenues of \$1.3 billion, excluding hospitals and auxiliary services, in fiscal 1992 to rank among comparable world-class university systems. State appropriations provide 60 percent of current fund revenues for U.S. public higher education. Thus, to place Massachusetts among the world-class systems, the total 1992 state appropriation for operating expenses would have to be \$780 million. As proposed in Table 14, to maintain a world-class system, total higher education appropriations for 1992 would have to be \$890.5 million.

From the fiscal 1991 state appropriations of \$526 million, it would require *real increases* of 4 percent annually in state appropriations for fiscal years 1992–2001 to reach the projected world-class figure by 2001. However, a caveat is in order because the National Center for Education Statistics projects that real expenditures on public higher education will increase by 2 percent annually from current levels throughout the next decade.⁴⁹ Consequently, it is more realistic to expect that keeping pace with existing world-class systems would require 6 percent annual real increases in state appropriations to the commonwealth’s public higher institutions.

The data indicates that throughout the 1980s the commonwealth’s public higher institutions relied on below-average core and supplementary revenue streams. However, with one exception — state appropriations — these shortfalls have largely been rectified. Among the core streams, student tuition and fees are among the highest in the nation for public institutions. Below-average performance in the supplementary streams, particularly private gifts and endowment income, is being remedied through aggressive private fund-raising campaigns, which the data shows are steadily bringing Massachusetts into line with national averages. Yet despite the fact that excellence and accessibility in the public sector are mainly a function of state appropriations, funding higher education is not a budget priority in Massachusetts.

The priority assigned to public higher education in a particular state can be measured in two ways. First, spending on higher education as a percentage of the total state budget may be used as an indicator of the importance state government places on higher education relative to other expenditures. Second, total tax dollars appropriated to higher education as a percentage of state personal income may be used as an indicator of state government’s willingness to support public higher education relative to the population’s ability to pay. The absence of genuine commitment to public higher education in Massachusetts is evident in both comparative measures.

Table 15

**Percentage of State and Local Tax Revenues
Allocated to Public Higher Education:
Selected Industrial States, 1988–1989***

	Appropriation as Percentage of Tax Revenues	Index**
United States	8.1	100
Alabama	13.1	162
North Carolina	12.2	150
California	10.6	131
Virginia	9.3	115
Minnesota	9.3	114
Wisconsin	9.0	111
Washington	8.9	110
Texas	8.1	100
Florida	7.8	96
Michigan	7.7	95
Ohio	6.9	85
Illinois	6.8	84
Pennsylvania	6.3	78
New York	5.8	72
New Jersey	5.7	70
Connecticut	5.7	70
Massachusetts	5.5	67

*This ratio suggests the relative importance of public higher education in the state budget compared to the funding of other public services by state and local governments.

**The index measures the relative priority of higher education in state budgets with the national average equal to 100 on the index.

Source: Kent Halstead, *State Profiles: Financing Public Higher Education, 1978 to 1989* (Washington, D.C.: Research Associates of Washington, 1989), 66.

Nationwide, state appropriations to public higher education currently average slightly more than 8 percent of total state and local expenditures (see Table 15). During the same period in Massachusetts, state appropriations to public higher education accounted for only 5.5 percent of total state and local expenditures. That allocation ranked Massachusetts forty-eighth in the nation in terms of the budget priority it assigns to public higher education. Furthermore, since the last report of nationwide comparative data, state appropriations to the commonwealth's public colleges and universities have fallen to 4 percent of total state and local expenditures — merely half the national average — meaning that Massachusetts now assigns a lower budgetary priority to public higher education than any state in the nation.

Clearly, if Massachusetts is to give adequate support to public higher education, it must partially realign its budget priorities, and the scope of called-for realignment is realistic. As the figures in Table 14 indicate, if Massachusetts were to restore real fiscal 1986 funding levels in fiscal 1992, total higher education spending would account for only 5.7 percent of total state spending. It would require only 6.8 percent of current state expenditures (in constant 1992 dollars) for Massachusetts to fund a world-class public higher education system; this figure remains substantially below the national average.

Moreover, arguments that the commonwealth "cannot afford" to finance public higher institutions at this time are not supported when one compares actual state spending on public higher education to the state's tax capacity. Even prior to the nine reversions of

fiscal years 1989–1991, Massachusetts ranked fifty-first among the states and the District of Columbia in the ratio of public higher education expenditures to state personal income (the central variable in measuring tax capacity).⁵⁰ On this point, it is worth noting that a January 1990 public opinion survey found that 68 percent of Massachusetts residents were willing to pay increased taxes to support public higher education, especially if specific tax revenues were earmarked for that purpose.⁵¹ In a state where the future is so closely tied to brainpower, it is an ironic paradox that elected officials lack the political commitment to fund so much as an average system of public higher education. 🐼

Appendix A

Equation 1:

A = per capita higher educational expenditure (\$6,667, U.S. average, academic year 1986)

B = 5 years (to account for graduate/professional training)

C = total cost per student

Hence, $A \times B = C$, $\$6,667 \times 5 = \$33,335$.

Equation 2:

D = \$23,383 (median annual salary of high school graduate)

E = \$38,337 (median annual salary of college graduate)

F = 1.02 (adjustment for anticipated real annual income growth of 2 percent)

G = estimated real income

Hence, D or $E \times F = G_2$, $G_2 \times F = G_3 \dots$ in which $DG_1 + DG_2 + \dots + DG_{40}$ and EG_{40} = real lifetime income.

Equation 3:

DG_{40} = average lifetime income of high school graduate (\$1,425,254)

EG_{40} = average lifetime income of college graduate (\$2,071,591)

H = average value added to human capital by college degree

Hence, $EG_{40} - DG_{40} = H$, or $\$2,071,591 - \$1,425,254 = \$646,000$.

Equation 4:

$H \div C = J$ (ratio of value added to per capita expenditure)

Hence, $\$646,000 \div \$33,335 = \$19$.

Equation 5:

$\$646,000 \times 0.06$ (tax and fee payments) = \$38,760 added tax and fee revenue

Appendix B

Computation of Projected Real Current Revenues per FTE Student by State with World-class Public University Systems

State	Current Revenues per FTE Student 1985–1986	Estimated Projection 1991–1992*		Enrollment Weighting Factor**		
New Mexico	\$9,149	\$11,619	×	.01	=	\$ 116
Georgia	9,100	11,557	×	.04	=	462
Colorado	8,388	10,653	×	.03	=	320
Virginia	8,383	10,646	×	.05	=	532
Michigan	8,376	10,638	×	.09	=	957
California	8,266	10,498	×	.29	=	3,044
Texas	8,223	10,443	×	.16	=	1,671
North Carolina	8,091	10,276	×	.06	=	617
Pennsylvania	8,018	10,183	×	.07	=	713
Ohio	7,832	9,947	×	.09	=	895
Illinois	6,697	8,505	×	.11	=	936
Average	\$8,229	\$10,451		n/a		\$10,263

*1985–1986 figure adjusted upward by 27 percent using the inflation index constructed in Table 13.

**Enrollment weighting factor is the FTE enrollment in each state as a percentage of the total FTE enrollment of the eleven states.

Source: 1985–1986 figures on current revenues per student FTE tabulated from data in NCES, *State Higher Education Profiles: 1988*.

Notes

1. States selected on the basis of comparative economic and employment data in Gerry Jones, ed., *State Information Book, 1987–1988* (Rockville, Md.: Infax, 1987).
2. For example, Joseph S. Slavet and Raymond Torto, *After the Revolt: A Framework for Fiscal Recovery* (Boston: John W. McCormack Institute of Public Affairs, 1990); Alicia H. Munnell and Lynn E. Browne, *Massachusetts in the 1990s: The Role of State Government*, Federal Reserve Bank of Boston, Research Report no. 72, November 1990; "Partial List of Proposed Spending and Economy Measures," *High Tech News*, November 1989, 4.
3. Herman Leonard, "The Choices Massachusetts Makes: A Comparative Analysis of State and Local Spending" (Boston: Pioneer Institute, November 1990); James K. Boyce and Thomas W. Hutcheson, *Budget Cuts and Public Higher Education in Massachusetts* (Amherst: Institute for Economic Studies, October 1990); for a summary of recent studies, see Charles Stein, "Studies a Challenge to Conventional Thinking," *Boston Globe*, December 4, 1990, 45.
4. James O'Connor, *The Fiscal Crisis of the State* (New York: St. Martin's Press, 1973), 101–123; Theodore W. Schultz, "Investment in Human Capital," *American Economic Review* 51 (March 1961): 1–17.
5. Robert Reich, *The Work of Nations* (New York: Alfred A. Knopf, 1991).
6. Michel Aglietta, *A Theory of Capitalist Regulation: The US Experience* (London: New Left Books, 1979).
7. Samuel Bowles, "Unequal Education and the Reproduction of the Social Division of Labor," in Jerome Karabel, ed., *Power and Ideology in Education* (New York: Oxford University Press, 1977), 137–152.
8. Michael J. Piore and Charles F. Sabel, *The Second Industrial Divide* (New York: Basic Books, 1984).
9. Daniel Bell, *The Coming of Postindustrial Society* (New York: Basic Books, 1973); Alain Touraine, *The Postindustrial Society* (New York: Random House, 1971).

10. Garth L. Mangum, *Youth and America's Future: The William T. Grant Foundation Commission on Work, Family, and Citizenship*, 1989.
11. George T. Silvestri and John M. Lukasiewicz, "Projections 2000: A Look at Occupational Employment Trends to the Year 2000," *Monthly Labor Review* 110, no. 9 (September 1987): 46–69; William B. Johnston, *Workforce 2000: Work and Workers for the Twenty-first Century* (Indianapolis: Hudson Institute, June 1987).
12. James M. Howell, *The Boston and Regional Economy in the 1990's: The Prospects for Economic Recovery* (Boston: Boston Redevelopment Authority, November 8, 1990), 18–21.
13. Commission on the Skills of the American Work Force, *America's Choice: High Skills or Low Wages!* (Rochester, N.Y.: National Center on Education and the Economy, 1990).
14. *Learning to Lead: Building a World-Class Public University in Massachusetts*, Report of the Commission on the Future of the University of Massachusetts (Saxon report), March 1989, 2.
15. Muriel Cohen, "Worldly Shortages Beset the Ivory Tower: New England Schools Face Tough Times," *Boston Globe*, December 9, 1990, 1.
16. Howard B. London, Patricia V. Markunas, and John E. v. C. Moon, *A Report Concerning the State Colleges of Massachusetts: Past, Present, and Future*, 3 vol., June 1990, vol. 2, 71.
17. *Learning to Lead*, 2.
18. Massachusetts Business Roundtable Fiscal Policy Task Force, *Report on Public Education in Massachusetts*, December 1989, 18; London et al., *Report Concerning State Colleges*, 71.
19. National Center for Education Statistics, *1989 Education Indicators* (Washington, D.C.: Government Printing Office [GPO], 1989), 98–99.
20. The actual annual yield on investment in higher education is 48.5 cents on each dollar invested. However, because state government appropriations, on average, account for only half of all public higher education revenues, a similar proportion of the investment dividend has been assigned to state government.
21. The 6 percent assumption is quite reasonable in light of findings by Andrew Reschovsky, "Massachusetts Tax Burdens, 1988," in *Taxation and Social Services* (Boston: Tax Equity Alliance of Massachusetts, 1989), Part II, 5. Reschovsky finds that the 1988 state tax burden ranges from 5.5 percent to 6.1 percent of annual income for individuals with an annual income of \$25,000 or more. These percentages include personal income, sales, and excise taxes, but not state fees and local property taxes.
22. The average total cost of a college or university education is \$33,335. However, because state government appropriations, on average, account for only half of all public higher education revenues, the actual investment by the state in each unit of enhanced human capital is \$16,668.
23. On the basis of current enrollment and student migration data, I estimate that approximately 48 percent of all students enrolled in a Massachusetts private college or university were not residents of the commonwealth at matriculation. For public institutions, see Deborah Ford and Doris Chow, *Geographic Origin of Undergraduates at Massachusetts Public Colleges and Universities, 1984–1986* (Boston: Board of Regents of Higher Education, 1988).
24. Data for seven of the nine state colleges shows that 80 to 90 percent of all alumni still reside in Massachusetts, while a few percentage points more live in other New England states; see London et al., *Report Concerning State Colleges*, 137–139.
25. *Learning to Lead*, 1.
26. *Chronicle of Higher Education Almanac*, September 5, 1990, 28. The definition of Research University I is "an institution that offers a full range of baccalaureate programs, is committed to graduate education through the doctoral degree, and gives a high priority to research."
27. The eight states that include two public RU I institutions are Pennsylvania, Michigan, Ohio, Illinois, Virginia, North Carolina, Florida, and Texas.

28. Franklyn G. Jennifer, *System and Campus: A Structure for Excellence* (Boston: Massachusetts Board of Regents, March 1989), 1.
29. National Center for Education Statistics (NCES), *State Higher Education Profiles: 1988* (Washington, D.C.: GPO, 1988), 23.
30. London et al., *Report Concerning State Colleges*, 150.
31. Massachusetts Business Roundtable, *Report of Public Education*, 21, observes that the initial fiscal 1989 state appropriation did rank Massachusetts among the top ten states in per capita funding for higher education. However, this ranking is somewhat misleading because approximately 12 percent of the appropriation went to student scholarship reserves, most of which went to students attending private institutions. Furthermore, it includes a \$4.5 million appropriation for the Tufts University Veterinary School. Although the progress of the public system was not quite as dramatic as it seemed, state appropriations have been reduced by \$143 million since that time.
32. NCES, *State Higher Education Profiles*, 52.
33. Massachusetts Business Roundtable, *Report on Public Education*, 29–30.
34. Figures from Peter Kozel, professor of finance at Babson College and consultant to the New England Economic Project on the Massachusetts Economy.
35. *Report of the Tuition Review Panel* (Boston: Massachusetts Board of Regents, March 30, 1990); Massachusetts Board of Regents of Higher Education, *A Margin for Excellence: A Tuition Policy for Public Higher Education in Massachusetts (A Statement of Principles)*, 1988; Massachusetts Board of Regents of Higher Education, *Annual Report, 1987–1988: Long-Range Plan for Public Higher Education in Massachusetts*.
36. Scot Lehigh, "Weld Faces Dilemma on Where to Cut," *Boston Globe*, January 20, 1991, 25.
37. NCES, *State Higher Education Profiles*, 23.
38. *Ibid.*, 40. Private institutions derive a low of 23.8 percent of their current fund revenues from tuition and fees in Alaska to a high of 84.5 percent in Delaware. The 35 percent proposed by the Regents would thus move Massachusetts's "public" institutions from the category of state-supported institutions to well within the range of private, state-assisted institutions.
39. London et al., *Report Concerning State Colleges*, 61.
40. See data in NCES, *State Higher Education Profiles*, 23, 25, 255, 257.
41. Joshua Cooper Ramo, "MIT Loses Bid to Build Research Lab," *Boston Globe*, August 20, 1990, 1.
42. Anthony Flint, "Regents Debate Hikes in Fees on Campuses," *Boston Sunday Globe*, November 11, 1990, B-28.
43. "Study Says State Lags in Giving to Colleges," *Boston Sunday Globe*, October 7, 1990, 34; "Panel Advises Public Colleges to Raise More Private Funds," *Providence Journal-Bulletin*, October 8, 1990, B-3.
44. Regents Task Force on Administrative Organization, *The Massachusetts Public Higher Education System: An Independent View*, January 1991, 6.
45. Jennifer, *System and Campus*, 1.
46. Southeastern Massachusetts University, *F.Y.I.* 3, no. 3 (Spring 1989): 1.
47. London et al., *Report Concerning State Colleges*, 41–42.
48. NCES, *Projections of Education Statistics to 2000* (Washington, D.C.: GPO, 1989), 17–27.
49. *Ibid.*, 91–97.
50. Kent Halstead, *State Profiles: Financing Public Higher Education, 1978 to 1989* (Washington, D.C.: Research Associates of Washington, 1989), 77.

51. Barry Bluestone, Mary Ellen Colten, and Thomas Ferguson, *Commonwealth's Choice: Results from the Massachusetts Public Opinion Survey* (Boston: John W. McCormack Institute of Public Affairs, January 1990).