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ABSTRACT

The purposes of this study were to: (1) examine the present financial status and problems facing private institutions of higher education in Massachusetts; (2) make projections of expected income and expenditures over the next 12 years, including the relation of these expenditures to program development; and (3) recommend ways of meeting the needs identified in the study. Chapter I summarizes the contribution of private institutions, and describes their current financial position and problems. Chapter 2 makes projections of probable trends in institutional revenues and expenditures and concludes that possible deficits for private institutions could reach $140 million by 1980-81. Chapter 3 explains why existing external sources of revenue will not be able to satisfy future financial demands and describes what steps the institutions might be forced to take and how these steps could weaken higher education in the state. The study recommends that the state provide direct financial support to its private institutions in the form of grants based on the number of degress awarded to Massachusetts residents; and increase the funding of the General Scholarship Program well above the level now planned. The study methodology and a breakdown of projection results are included in the appendix. (AF)

FINANCIAL PROBLEMS of MASSACHUSETTS PRIVATE HIGHER EDUCATION

REPORT OF THE SELECT COMMITTEE FOR THE STUDY OF FINANCIAL PROBLEMS OF PRIVATE INSTITUTIONS OF HIGHER EDUCATION IN THE COMMONWEALTH OF MASSACHUSETTS

JANUARY 1970

The Honorable Francis W. Sargent
Governor, The Commonwealth of Massachusetts

The Honorable Winthrop S. Dakin
Chairman, The Board of Higher Education

Dr. Arland F. Christ-Janer
President, Association of Independent Colleges and Universities

Gentlemen:

We are honored to submit herewith the report of your Select Committee for the Study of Financial Problems of Private Institutions of Higher Education in the Commonwealth of Massachusetts.

The continued vitality of the private educational sector in Massachusetts is a matter of great concern to all of us. There are clear indications that the challenges of the last quarter of the twentieth century, to say nothing of the twenty-first, will require all the intelligence and wisdom that we can summon. While attendance at college is no guarantee of a higher quality of life, the widening opportunity for further education can become an important force in strengthening the competence and conscience, the experience, understanding, and compassion of our young people.

If sound, healthy institutions of higher education are to be available for an increasing percentage of both the young and older adult populations, those institutions must be given a higher rank among the Commonwealth's priorities than they have thus far received. The Committee notes with pleasure the remarkable expansion now taking place in public higher education in the Commonwealth and wishes to see it continue. We believe that public sector growth should be paralleled by a similar commitment to sustaining the vigor of the private

colleges and universities, which have meant so much to the state over the centuries. As the following report shows, increasing financial pressures threaten the continued vitality of these institutions. Therefore, we make the following recommendations:

¶ The Commonwealth should provide direct financial support to its private institutions of higher education in the form of grants based on the number of degrees awarded to Massachusetts residents.

¶ The Commonwealth should act immediately to further ensure equality of educational opportunities for Massachusetts residents by increasing the funding of the current General Scholarship Program well above the level now planned.

We have enjoyed our assignment and are grateful for your generous interest in our conclusions.

Yours very truly,

William G. Saltonstall,
Chairman

Vernon Alden
Martha Peterson
Abram Sachar
The Very Reverend Michael P. Walsh, S.J.

Ex-officio

Arland Christ-Janer
President, Association of Independent Colleges and Universities of Massachusetts
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REPORT OF THE SELECT COMMITTEE

The Select Committee for the Study of Financial Problems of Private Institutions of Higher Education in Massachusetts is pleased to submit its report in response to its charge of April 17, 1969 from Governor Francis A. Sargent. The Committee's objectives, as set forth by Governor Sargent, were:

- ¶ To conduct an examination of the present financial status and problems facing the private degree-granting institutions in the state, including current income and expenditures, capital investment, and deferred maintenance.

- ¶ To make projections of expected income and expenditures over the next 12 years (to 1980-81), including the relation of these expenditures to program development.

- ¶ To conduct an exploration of possible alternatives in meeting the needs, if any, identified in the study (including state, federal, and private sources of funding and implications of each).

The Select Committee has now weighed the results of the study conducted to meet these objectives. That study, which was carried out by McKinsey & Company, Inc., under the direction of the Committee, has identified the status of Massachusetts private higher education today and indicated its financial needs in the future. Projections of revenues and expenditures developed during the study show that the private institutions of higher education will incur increasing deficits in the next few years unless new and substantial sources of revenue become available. If no action is taken to counter the projected deficits, the private colleges and universities will have increasing difficulty sustaining the current level of enrollments and maintaining their reputation for excellence–both of which have contributed so importantly to higher education in Massachusetts over the years. And, of more serious consequence, continuing financial deficits may even call into question the future existence of a number of private institutions.

The Select Committee believes that, to prevent a decline of private higher education in Massachusetts, the Commonwealth should now provide direct financial assistance to its private institutions. We believe that such assistance should be provided even as the rapidly expanding public sector of higher education in Massachusetts makes increasing financial demands. We believe that the ultimate survival of the dual system of higher education (public and private) is dependent upon such direct financial assistance from the Commonwealth to private educational institutions.

Our decision to recommend direct state support for private higher education is taken at a time when the educational, economic, and social contributions of the Commonwealth's private institutions surpass all previous levels. But the mounting cost of operating and expanding private institutions of higher education is generating financial pressures that threaten to limit and even reduce the future contributions made by those institutions.

Financial projections based on historical trends, institutional expectations, and environmental factors show that private higher education in Massachusetts will face deficits on the order of $50 million by 1975-76 and perhaps two to three times that amount by 1980-81. While the projected level of deficits is sufficient cause for concern, the upward

trend in their magnitude is especially alarming to the Committee. This trend forecasts, in our view, a progressive deterioration of the private sector's ability to continue its current level of contributions to higher education in the state.

While we encourage the private institutions in the Commonwealth to continue their all-out efforts to increase the level of external support they receive, the study findings convince us that this source of funds is not likely to provide sufficient additional revenue–beyond that assumed in making the projections–to offset more than a small fraction of projected deficits. In fact, colleges and universities may be hard pressed to achieve even the rate of growth in private giving assumed in the study.

Financial support from the federal government does not appear to offer a solution to the private sector's financial problems for two reasons. First, federal funds have been largely provided for services (e.g., research) that generate only incidentally financial support for other educational activities. And research has been, and continues to be, highly concentrated in relatively few institutions. Second, new forms of substantial financial support from the federal government appear unlikely in the near future. As the war in Vietnam continues to make demands on the nation's resources–and as problems of poverty, hunger, urban blight, and pollution press for solution–the federal government can be expected to be highly selective in its spending for domestic programs. The end of the war will not necessarily bring a rapid rise in funds for higher education. This Committee recognizes, much to its distress, that it may be several years before higher education will rank high among the nation's domestic priorities.

Confronted by the prospect of inadequate increases in existing external sources of funds, many private colleges and universities in the Commonwealth will be forced to enact internal measures to cope with their worsening financial positions. Curtailment of enrollment growth, limitation of student aid expenditures, continuance of a high rate of tuition growth, and reduction of educational resources available for each student may well be the ultimate result of financial problems in private higher education. The use of such measures by the private institutions has important implications for Massachusetts. The Committee strongly believes that these actions forced upon the private institutions by their financial plight would be directly counter to the Commonwealth's goal of expanding educational opportunities for all its residents. Such actions by the private institutions of higher education would place an increasing moral and financial burden on the public institutions of the Commonwealth–over a period when Massachusetts is likely to face increasing shortages of educational spaces, mounting to 85,000 by 1980.* To the extent such results can be avoided or minimized by reasonable financial assistance from Massachusetts, such assistance should be rendered.

Therefore, we recommend that the Commonwealth provide direct financial support to its private institutions in the form of grants based on the number of degrees awarded to Massachusetts residents, which is, in our judgment, the best method for channeling state funds to private higher education. We recommend that the funding level for the direct grants program be set as a percentage of the cost to the state of producing a degree in a comparable Massachusetts public institution. This formula reflects the Committee's belief that, by

*_Enrollment Study for Massachusetts_, Massachusetts Board of Higher Education, January 1969.

serving a substantial number of Massachusetts residents, the private colleges and universities relieve the Commonwealth of the responsibility of educating those residents solely at public expense. By giving private colleges and universities financial support equaling a small fraction of the cost of educating students in the public institutions, the Commonwealth would help maintain the private sector's ability to educate Massachusetts residents at present or increased levels of enrollment and quality. At this time, we propose that the funding level be set at 15 percent of the actual public cost of educating a Massachusetts resident in a comparable public institution. Grants would be distributed on a graduated scale in proportion to the estimated public cost of each type of degree, as shown in the following table.*

Table

Proposed Award per Degree for

Massachusetts Residents in 1972-73

Degree Type	Estimated[1] 1972-73 Public Cost per Degree	Proposed Award (Approximately 15 Percent of Public Costs)
Associate	$ 2,800	$ 400
Bachelor's	7,000	1,000
Master's	5,300	800
First Professional	7,900	1,200
Ph. D.	21,000	3,100
Medical and Dental	28,000	4,200

[1] Precise data from which to estimate the 1972-73 public costs by type of degree are not available at this time. If the proposed award program is adopted, steps should be taken to ensure that the necessary cost data are made available on a continuing basis.

The payment schedule presented in this table could be expected to generate by 1972-73 approximately $20 million per year, an amount roughly equal to the projected deficit for 1972-73. The distribution to individual institutions would not, of course, bear a direct relationship to the amount of their individual deficits; nor is it necessarily desirable to tailor state assistance to the particular financial weaknesses of specific institutions. The results of the proposed assistance program would, in our opinion, be positive in two important respects: (1) sufficient funds would be made available by 1972-73 to improve substantially

*In addition, deductions would be made for prior state payments for intermediate degrees in two situations: (1) when an associate degree is earned enroute to a bachelor's degree and (2) when a master's degree is earned enroute to a doctorate.

the overall ability of the private sector to overcome its shortages of funds; and (2) relatively greater assistance would be provided to those institutions that have not been able to keep pace with the general rate of improvement in student aid, student-to-faculty ratios, faculty salaries, and amount of total education resources devoted to each student. A payment schedule based on 15 percent of the estimated public cost of providing degrees would provide about $25 million in 1975-76—significantly less than the $50 million deficit projected for that year.

In making our recommendation for support of private higher education in Massachusetts, we are aware that the Massachusetts Constitution specifically addresses the issue of direct assistance to private institutions. We recommend that, if necessary, the Constitution be amended to permit direct state aid to all private institutions of higher education except those avowedly engaged in education primarily for religious training.

Throughout its deliberations the Committee, in line with its charge, concentrated on the needs of Massachusetts private institutions, not necessarily on the needs of the students who attend them. However, it became apparent during the study that private institutions incur significant deficits in their student aid programs. These deficits represent an important contribution of the private institutions toward achieving the state goal of expanding educational opportunities. In fact, it can be said that these institutions, through their financing of student aid to Massachusetts residents, are assuming a burden that is rightfully a responsibility of the Commonwealth. Therefore, we also recommend that to help relieve this burden, the Commonwealth should rapidly accelerate the current expansion of the scholarship program.

The attached study, which provides support for the recommendations we have made, should be considered an integral part of the report of the Select Committee.

FINANCIAL PROBLEMS of MASSACHUSETTS PRIVATE HIGHER EDUCATION

McKinsey & Company, Inc.

December 31, 1969

Mr. William Saltonstall, Chairman
Select Committee for the Study of Financial
Problems of Private Institutions of Higher
Education in the Commonwealth of Massachusetts
Boston, Massachusetts 02111

Dear Sir:

With this letter we are submitting our report, *Financial Problems of Massachusetts Private Higher Education,* which presents the results of our study of the financial difficulties of private higher education within the Commonwealth of Massachusetts. As an introduction to the body of the report, this letter: (1) describes briefly the background of the study; (2) discusses how the study was carried out; (3) summarizes the study findings; and (4) outlines the organization of the report.

Background
Of the Study

That the nation's institutions of higher education—and, in particular, its private institutions—are in financial trouble is a widely accepted and much discussed conclusion in the academic community.* And concern has spread beyond the educational community as the news media have brought the problems of higher education to the general public. As early as 1967, *Time* wrote on "The Precarious Future of the Private College"; *U.S. News and World Report* carried "The Coming Crisis in Private Colleges"; and *Fortune* reported on "Private Colleges: A Question of Survival."**

To provide a basis for appraising the particular financial status of private higher education in Massachusetts, Governor Francis W. Sargent appointed the Select Committee for the Study of Financial Problems of Private Institutions of Higher Education in the Commonwealth of Massachusetts. The study documented in this report was carried out under the direction of the Select Committee to meet the objectives set by the Governor.

Conduct of
The Study

An important purpose of the approach followed throughout the 6-month study effort was to ensure that our findings would be fully responsive to the needs of the Select Committee. To fulfill that purpose, we met frequently with the Select Committee and with individual members to review our findings and to elicit suggestions and comments. We also met twice with the Executive Committee of the Association of Independent Colleges and Universities in Massachusetts.

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*William G. Bowen, for example, discussed the pressures and problems facing higher education in *The Economics of the Major Private Universities,* The Carnegie Commission on the Future of Higher Education, 1968.

**_Time_, June 23, 1967; *U.S. News and World Report*, September 18, 1967; and *Fortune*, October 1967.

The study effort was organized into two phases : (1) gathering data from the private institutions and other sources, and (2) analyzing the data and developing projections of major revenue and expenditure components. In the sections that follow we discuss each study phase.

Gathering Data

Most information available on the financing of private higher education is inaccurate, incomplete, or out of date. To compile current data for developing a realistic description of the financial status of Massachusetts private higher education, we turned to the private institutions themselves. The study team prepared data collection forms designed to obtain reliable data from the institutions concerning their important educational characteristics and major revenue and expenditure components. Two kinds of information were requested:

1. **Historical data** – to document the dimensions of educational activity and financial results of the recent past

2. **Projections** – to reveal institutional plans and expectations for the next 12 years.

In early August, a series of meetings was held with business officers of the Massachusetts private institutions; at those meetings the forms, definitions, and instructions to be used in collecting data were discussed. During August and September, the business officers completed the forms and submitted them to the study team.* Every submission was then carefully edited to correct for major omissions or errors.

The study team supplemented its prime information source–data submitted by the private institutions–with information acquired by interviewing the presidents and other officers of 12 private institutions in the Commonwealth. Institutions at which interviews were conducted were selected to reflect the diverse roles and financial situations of all the institutions. Additional material–primarily for use in exploring alternative sources of financing–was found in the published literature on the financial problems of private colleges and universities.

Analyzing the Data
And Developing Projections

The first step in the analyses of the data was to divide the institutions into six groups so that the wide variations in financial and educational characteristics between institutions could be identified and properly treated. The institutions were initially grouped by type–i.e., 2-year institutions, specialized colleges, colleges, and universities. The institutions classified as colleges were further divided to account for important differences in financial resources; the basis for the division was educational and general expenditures per student–net of sponsored research.**

The university group was further divided to place Harvard University and the Massachusetts Institute of Technology in a separate group. This step was taken because the

*Appendix A to the report provides a description of institutional participation in the study.

**The use of level of educational and general expenditures per student–net of sponsored research–resulted in a division that was highly relevant for making financial projections. Each of the two groups formed by the division contained institutions with similar revenue and expenditure characteristics.

large financial resources and heavy research orientation of those two universities would tend to distort the financial analysis of the private universities as a group. The institutions included in each group are listed immediately following this letter.

Using data for each group, we then derived the trends in revenue and expenditure components implicit in both the historical data and the institutional projections. These trends—along with information on environmental factors—were used to predict future trends as the basis for projecting major revenue and expenditure components for 1972-73, 1975-76, and 1980-81. As a final step, alternate trend assumptions were tested to determine their possible impact on the size of projected deficits.

Summary of Study Results

Perhaps the most striking feature of private higher education in Massachusetts is the dominant role it has historically played, and continues to play, in the total structure of higher education in the Commonwealth. In 1968-69 the private institutions accounted for over two-thirds of all students enrolled in higher education in Massachusetts and for almost three-fourths of all degrees granted. In the same year, private institutions granted 81 percent of all master's degrees awarded in the state, 92 percent of all doctoral degrees, and all of the first professional degrees (e.g., M.D. and L.L.B.). As the public sector of Massachusetts higher education has expanded, these proportions have gradually declined. The private sector has nevertheless reached record highs in the absolute numbers of total students and Massachusetts residents enrolled and in the number of degrees granted.

In addition to these measurable educational contributions, Massachusetts private higher education has produced substantial economic benefits for the Commonwealth. Millions of dollars have flowed into the Commonwealth's economy by way of expenditures of the institutions. And the industrial growth of Massachusetts, especially in the Boston metropolitan area, has received enormous impetus from the technology-oriented research and laboratory operations of the Commonwealth's private institutions.

But the ability of the private institutions as a group to continue to make contributions at the current level is being called into question. Several institutions are already facing financial difficulty; and our findings in this study indicate that the number of institutions in financial trouble will grow, and that the severity of their problems will increase. Specifically, we have concluded that:

¶ **Private higher education in Massachusetts is now experiencing financial problems.** Declining amounts of net operating funds,* growing debt levels, and increasing levels of deferred maintenance in private institutions of higher education reveal some of the impact of the rapidly rising costs of operation and facility improvement.

¶ **The private institutions can be expected to incur increasing deficits in the near future.** Without substantial increases in revenues or curtailment of educational

*The excess of operating revenues over operating expenditures.

programs, the private institutions in Massachusetts could face deficits of $50 million by 1975-76 and perhaps two to three times that amount by 1980-81.

¶ **Existing external sources of income are unlikely to provide sufficient additional revenue, beyond that assumed in making projections, to offset deficits.** A number of factors in today's environment (e.g., new competitors for the philanthropic dollar) will most likely preclude the increases in private giving and support from the federal government that would be required to keep pace with–let alone surpass–growth in expenditures.

¶ **Left with little hope of gaining sufficient funds from existing external sources of revenue, the private institutions will be forced to enact internal measures to cope with projected deficits–measures that would be counter to the educational goals of the Commonwealth.** Internal steps that might be taken to help remedy the financial problems of private higher education include limiting enrollment growth, raising tuition more rapidly, cutting back student aid expenditures, and holding down capital investment. Such measures would narrow the scope of educational opportunity in Massachusetts.

Organization
Of the Report

The findings and conclusions developed during the study of the financial problems of Massachusetts private higher education are presented in three chapters in the report.

Chapter 1–Contributions and Signs of Decline: The first chapter summarizes the contributions made by private institutions of higher education to the Commonwealth. It also describes the current financial position of the private institutions, identifying signs of increasing financing problems.

Chapter 2–Financial Projections: This chapter briefly describes the assumptions used to develop projections. The results of those projections are presented for Massachusetts private higher education in aggregate and by group.

Chapter 3–Alternative Methods of Financing Future Requirements: The final chapter explains why existing external sources of revenue will not be able to satisfy future financial demands of the private institutions. It also describes what steps the institutions might be forced to take to cope with the projected deficits–and how those steps could weaken higher education in the Commonwealth.

For the reader who is interested in the fact-finding and analytical processes employed, Appendix A to the report provides a detailed description of the study methodology. In addition, Appendix B provides the group projection results for the individual revenue and expenditure components.

* * *

We would like to express our appreciation for the cooperation and assistance we received throughout the study. The Select Committee was especially helpful in making its time

available to us and in offering suggestions and comments that served to guide and advance the study effort. We also wish to thank the staff of the Massachusetts Board of Higher Education for support throughout the study.

The Executive Committee of the Association of Independent Colleges and Universities in Massachusetts was extremely cooperative in gaining the active participation of its member institutions. And, of course, the private colleges and universities that responded to our requests for institutional data deserve a special note of thanks; without their cooperation, this study could not have been completed. We particularly wish to express our appreciation to those institutions at which we conducted interviews during the study; the interviews provided additional and important insight into the particular financial situations of institutions with different educational and financial characteristics.

Respectfully submitted,

COMPOSITION OF INSTITUTIONAL GROUPINGS USED IN THE STUDY

GROUP I–Two-Year Institutions

Aquinas Junior College of Business-Milton
Aquinas Junior College of Business-Newton
Bay Path Junior College
Becker Junior College
Bradford Junior College
Dean Junior College
Endicott Junior College
Fisher Junior College
Forsyth School of Dental Hygienists
Franklin Institute of Boston
Garland Junior College
Grahm Junior College
Lasell Junior College
Leicester Junior College
Mount Ida Junior College
Pine Manor Junior College
Wentworth Institute
Worcester Junior College

GROUP II–Specialized Colleges

Babson College
Bentley College
Boston Conservatory of Music
Hampden College of Pharmacy
Massachusetts College of Optometry
Massachusetts College of Pharmacy
New England Conservatory of Music
Nichols College of Business Administration
Springfield College

GROUP III–Nonspecialized Colleges– Lower Expenditures per Student

American International College
Anna Maria College
Atlantic Union College
Cardinal Cushing College Incorporated
College of Our Lady of the Elms
Curry College
Eastern Nazarene College
Emerson College
Emmanuel College
Gordon College
Hellenic College
Lesley College
Merrimack College
Newton College of the Sacred Heart
Regis College
Stonehill College
Suffolk University
Western New England College
Wheelock College

GROUP IV–Nonspecialized Colleges– Higher Expenditures per Student

Amherst College
Assumption College
College of the Holy Cross
Mount Holyoke College
Simmons College
Smith College
Wellesley College
Wheaton College
Williams College
Worcester Polytechnic Institute

GROUP V–Universities Except Harvard University and Massachusetts Institute of Technology

Boston College
Boston University
Brandeis University
Clark University
Northeastern University
Tufts University

GROUP VI–Harvard University and Massachusetts Institute of Technology

Harvard University
Massachusetts Institute of Technology

FINANCIAL PROBLEMS OF

MASSACHUSETTS PRIVATE HIGHER EDUCATION

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FINANCIAL PROBLEMS OF MASSACHUSETTS PRIVATE HIGHER EDUCATION

1-CONTRIBUTIONS AND SIGNS OF DECLINE

This report presents the findings of a study designed to determine the magnitude and nature of the financial problems of private higher education in the Commonwealth of Massachusetts. It describes the financial condition of Massachusetts private higher education today, indicates how severe its financial problems could become in the future, and suggests what might have to be done to overcome those financial difficulties.

This first chapter of the report identifies the important contributions being made by Massachusetts private higher education to the Commonwealth and the nation. It then points to signs of increasing financial troubles that threaten to limit the future contributions of the private institutions.

CONTRIBUTIONS OF PRIVATE HIGHER EDUCATION

The educational, economic, and social contributions of Massachusetts private institutions of higher education have long been widely recognized and acclaimed. Today, these contributions are greater than ever. Study findings on the current status of private higher education in the Commonwealth show that:

- ¶ Massachusetts private higher education is generating more educational output—as measured by enrollment levels and number of degrees granted—than at any other time in its history
- ¶ The private sector continues to bear the major responsibility for higher education in the Commonwealth
- ¶ Strong emphasis by private higher education on graduate education provides a distinctive contribution to Massachusetts and the nation
- ¶ The private institutions play a major role in the economic and social development of the Commonwealth.

The sections that follow describe more fully these four facets of private higher education's contributions to Massachusetts.

Growing Educational Output

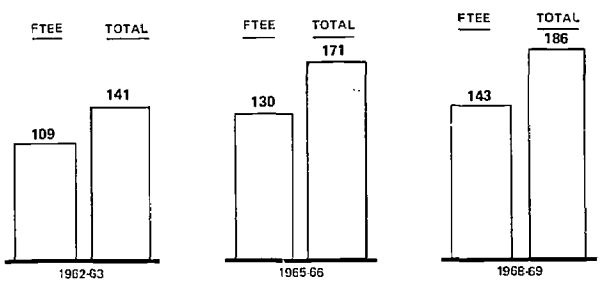
Enrollment and degrees granted are the two most commonly used quantitative indexes of the output of educational institutions. Enrollment indicates the number of students to whom the "services" of an institution are made available. Degrees granted show the number of students who have actually completed prescribed curricula. By both measures, Massachusetts private higher education has grown substantially over the past few years.

Data compiled during the study indicate that the private institutions are currently enrolling more students than at any time in history. As Figure 1 shows, private

enrollments–based on total headcount*–amounted to 186,000 students in 1968-69–an increase of almost one-third over the 1962-63 level. In terms of full-time equivalent enrollments (FTEE),** the growth rate was approximately the same–increasing to 143,000 students in 1968-69. But the rate of growth has dropped off recently; Figure 1 shows that two-thirds of the headcount increase from 1962-63 to 1968-69 actually took place in the first half of the period.

FIGURE 1

ENROLLMENTS* IN MASSACHUSETTS PRIVATE INSTITUTIONS
TOTAL HEADCOUNT AND FULL-TIME EQUIVALENT ENROLLMENT
1962-63, 1965-66, 1968-69
(Thousands of Students)



*Figures for total enrollments and for FTEE exclude extension students, as do all subsequent enrollment figures in Chapter 1.

SOURCE: *McKinsey Survey of Private Institutions of Higher Education in Massachusetts (subsequently referred to as "Survey")*

Although all groups of institutions*** experienced some growth over the 6-year period 1962-63 to 1968-69, Group III (colleges with lower expenditures per student) and Group V (universities exclusive of Harvard and MIT) were the principal contributors to the expansion, with percentage increases that well exceeded the average of 32 percent. Group IV (colleges with higher expenditures per student) and Group VI (Harvard and MIT), containing many colleges and universities that have evidently limited enrollment expansion, showed the smallest relative increases. Enrollment growths for all groups are given in Table 1.

Table 1

Growth in Full-Time Equivalent Enrollment by Group–1962-63 to 1968-69
(Thousands of Students)

	1962-63	1968-69	Percentage Increase
Group I	11	13	18%
Group II	6	8	35
Group III	15	22	50
Group IV	14	17	16
Group V	43	62	44
Group VI	20	22	12
Total	109	144	32%

Source: Survey

*Total headcount includes all full-time and part-time students but excludes all extension students; in 1968-69, extension students numbered 13,000.

**The FTEE measure reduces part-time students to an equivalent number of full-time students.

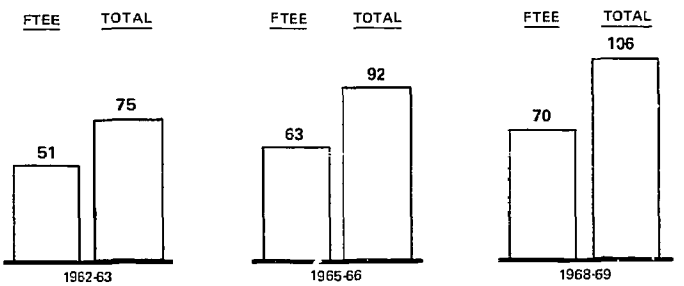
***Institutions were classified into groups according to type, as explained in the introductory letter to this report.

Enrollment of Massachusetts residents in the private sector–a more specific measure of output directly beneficial to the Commonwealth–also reached a record high in 1968-69, as shown in Figure 2. Comparison of Figures 1 and 2 reveals that the 106,000 Massachusetts residents accounted for 57 percent of total enrollment in those institutions–up from 53 percent in 1962-63. The Massachusetts resident fraction of FTEE–49 percent–was below the comparable fraction of total enrollment because Massachusetts residents make up a disproportionately higher share of the part-time enrollment of the private institutions.

FIGURE 2

MASSACHUSETTS RESIDENTS ENROLLED IN PRIVATE INSTITUTIONS IN THE STATE 1962-63, 1965-66, 1968-69

(Thousands of Students)

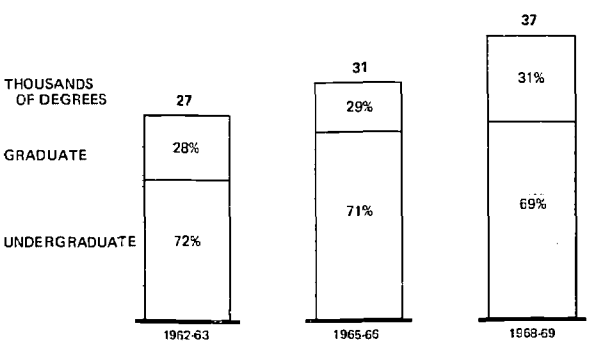


SOURCE: *Survey*

Growth in the number of degrees granted by private colleges and universities in Massachusetts has paralleled the growth in total enrollments. As Figure 3 shows, the number of degrees granted by private institutions grew from about 27,000 in 1962-63 to about 37,000 in 1968-69–an increase of slightly more than one-third. During the same period, undergraduate degrees as a percentage of total degrees awarded have declined, indicating a growing emphasis on graduate programs.

FIGURE 3

DEGREES GRANTED BY MASSACHUSETTS PRIVATE INSTITUTIONS 1962-63, 1965-66, 1968-69



SOURCE: *Survey*

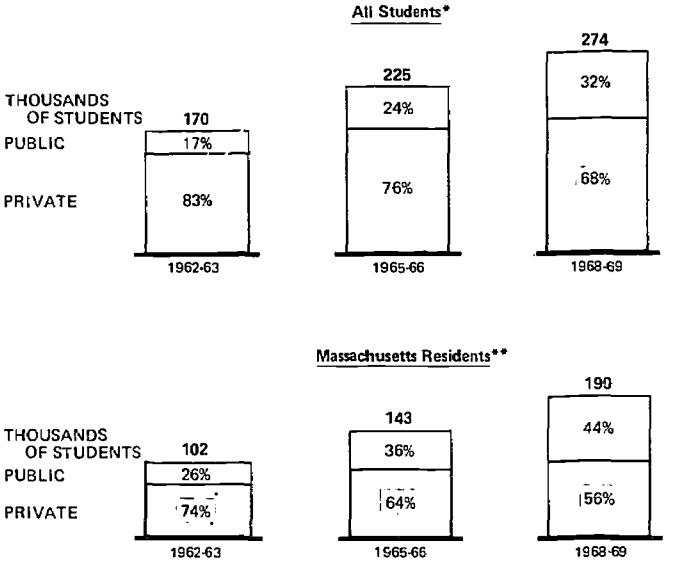
Private Share Of Higher Education

The steady growth of the private institutions in total enrollment and in enrollment of Massachusetts residents has occurred alongside a rapid expansion of the public sector of

higher education. Enrollment in the public sector has more than tripled since 1962-63, with the result that the percentage of both Massachusetts residents and total student population accounted for by the private sector has declined even though the absolute numbers have increased. These trends are depicted in Figure 4.

FIGURE 4

PUBLIC AND PRIVATE HEADCOUNT ENROLLMENTS IN MASSACHUSETTS 1962-63, 1965-66, 1968-69



Private enrollments were obtained from the Survey; public enrollments were obtained from annual editions of Opening Fall Enrollment in Higher Education, U.S. Office of Education.

***Massachusetts residents in the private sector were obtained from the Survey. Massachusetts residents in the public sector were estimated by multiplying public sector headcount enrollment by 95 percent - since, by institutional agreement, nonresident enrollment in public institutions is limited to 5 percent.*

In spite of this rapid public sector expansion, the private sector's current share of total Massachusetts enrollment was 68 percent in 1968-69. This is–by way of contrast–more than double the private share (28 percent) of national higher education enrollments. As in Massachusetts, the private share nationwide has been declining (Table 2).

Table 2

National Enrollments–1962-63, 1965-66, and 1968-69
(Thousands of Students)

	1962-63		1965-66		1968-69	
	Enrollment	Percent	Enrollment	Percent	Enrollment	Percent
Private Sector	1610	38%	1967	33%	2102	28%
Public Sector	2597	62	4000	67	5469	72
Total	4207	100%	5967	100%	7571	100%

Source: Annual editions of *Opening Fall Enrollments in Higher Education*, U.S. Office of Education

Emphasis on
Graduate Education

Strong emphasis on graduate education is a distinctive feature of private higher education in Massachusetts–a feature that sets the private sector apart from both the Massachusetts public sector and higher education nationwide. And this emphasis has been increasing. As shown in Table 3, graduate enrollments in 1962-63 accounted for 18.3 percent of total enrollments in the private sector. In the succeeding years, the growth rate in graduate enrollment exceeded the growth rate in total enrollment; as a result, the graduate fraction had increased to 20.0 percent by 1968-69.

Table 3

Enrollment in Massachusetts Private Sector by Level–
1962-63, 1965-66, and 1968-69
(Thousands of Students–Total Headcount)

	1962-63		1965-66		1968-69	
	Enrollment	Percent	Enrollment	Percent	Enrollment	Percent
Graduate	26	18.3%	33	19.0%	38	20.0%
Undergraduate	115	81.7	138	81.0	148	80.0
Total	141	100.0%	171	100.0%	186	100.0%

Source: Survey

Comparisons with the Massachusetts public sector and with higher education nationally provide evidence of the Massachusetts private sector's distinctive emphasis on graduate education. In 1968-69, 15.9 percent of all Massachusetts public enrollment was in postbaccalaureate programs. Nationally, the proportion of graduate students was also higher in the private sector than in the public sector–18.6 percent versus 11.9 percent–but neither proportion was as high as that accounted for by the Massachusetts private sector.

The shift to more graduate education in the private sector of Massachusetts higher education is also reflected in the mix of degrees granted. Graduate degrees increased from 28 percent of total degrees awarded in 1962-63 to 31 percent in 1968-69 (Figure 3 above). More significantly, in terms of contribution to the Commonwealth, the private sector has granted the bulk of advanced degrees awarded by all Massachusetts colleges and universities; in 1968-69 the private sector awarded 86 percent of the first professional, master's, and doctor's degrees granted in the state. Table 4 shows that the recent rapid growth in the public sector has materially altered the degrees-awarded balance between the public and private sector at the undergraduate level but has had only slight impact on the dominant role of the private sector in graduate education.

Table 4

Degrees Granted in Massachusetts–1962-63, 1965-66, and 1968-69

	1962-63		1965-66		1968-69	
	Number	Percentage of Total	Number	Percentage of Total	Number	Percentage of Total
Associate[1]						
Private	5,858	94%	6,393	85%	6,070	65%
Public	375	6	1,067	14	3,316	35
Total	6,233		7,460		9,386	
Bachelor's						
Private	13,216	80	15,550	79	19,623	70
Public	3,397	20	4,231	21	8,280	30
Total	16,613		19,781		27,903	
First Professional						
Private	1,535	100	1,778	100	2,312	100
Public	0	0	0	0	0	0
Total	1,535		1,778		2,312	
Master's						
Private	5,101	81	6,072	78	7,563	81
Public	1,206	19	1,679	22	1,752	19
Total	6,307		7,751		9,315	
Doctorate						
Private	908	97	1,127	94	1,397	92
Public	27	3	72	6	120	8
Total	935		1,199		1,517	
Total						
Private	26,618	85	30,920	82	36,965	73
Public	5,005	15	7,049	18	13,468	27
Total	31,623		37,969		50,433	

[1] Associate degrees include occupational certificates.

Sources: Private degrees granted were obtained from the Survey. Public degrees granted were obtained from *Earned Degrees Conferred*, U.S. Office of Education; Massachusetts Board of Regional Community Colleges; and Registrar's Office of Newton Junior College and Quincy Junior College.

Economic and Social Contributions

While educational output as measured by enrollment and degrees granted provides some measure of the contributions of Massachusetts private institutions to the state and to the nation, it tells only part of the story. The private sector's economic and social contributions–which must in many cases be measured indirectly–are also substantial.

Private higher education has assisted Massachusetts economically in various ways. Most directly, private institutions pour millions of dollars in annual expenditures into the economy. In 1968-69, the private sector spent $773 million in operating expenditures and an additional $90 million in plant expenditures.

More indirectly, the private sector's total cumulative investment of over $1 billion in physical plant represents an enormous physical resource for the Commonwealth–a resource obtained with minimal use of state funds. In addition, by enrolling Massachusetts residents, private institutions have relieved the Commonwealth of a major share of its responsibility for providing educational opportunities for its citizens. If the state were supporting its residents who are enrolled in private institutions in 1969-70 at the level budgeted for public institutions, the operating cost of higher education in the state–net of tuition and fees revenue–would approximately double, adding a tax burden in excess of $90 million.

Industrial development in the Commonwealth has also been a major beneficiary of the private sector. The presence of major colleges and universities in the Boston area has provided much of the impetus for the buildup of the Route 128 industrial complex. A study at the Sloan School of Management of MIT offers one index for measuring a part of this buildup. The study results indicated that by 1964, 156 companies had been spun off from five laboratories and four departments at MIT; those companies had total sales of over $200 million.* We expect that a similar study conducted today would show a dramatically higher level of sales.

In addition to its substantial economic contributions, the private sector has made significant social contributions. The private institutions have educated men and women who have provided outstanding leadership in a wide range of professional fields, including medicine, law, science, and business. This contribution, which cannot be measured in dollars, has helped ensure the growth and development of Massachusetts and the nation.

SIGNS OF INCREASING FINANCIAL DIFFICULTY

Although at a peak of growth and achievement, private institutions of higher education in Massachusetts are showing signs of increasing financial difficulties–difficulties that threaten to limit the extent of their future contribution. The prime cause for private higher education's weakening financial position is fundamental–costs are rising more rapidly than revenues.** The difference in these growth rates has caused a decline in the excess of operating revenues over operating expenditures, which many institutions have relied on to help build physical plant. As a result, the institutions face a growing shortage of funds to finance capital expenditures. Caught between inadequate funds and expanding needs, more institutions are resorting to debt to pay for capital investments while postponing, when possible, required improvements to physical plant. As costs continue to rise faster than revenues, it will become increasingly difficult for the private institutions to cover operating costs, let alone to provide capital funds from operating revenues.

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*Results of the Sloan School study were reported by Dr. Edward B. Roberts in "Entrepreneurship in Technology," *Research Management*, Vol. 11 (No. 4), 1968.

**For an excellent analysis of the reasons for this development in higher education generally, see William G. Bowen's *The Economics of the Major Private Universities*, published in 1968 by the Carnegie Commission on the Future of Higher Education.

In the following sections, we assess the present financial situation of Massachusetts private higher education. We discuss separately financial pressures in the operating account and the capital account because of their different characteristics. The chapter closes with a description of the overall financial status of the private institutions at this time.

Present Status of Operating Account

The operating (or current) account covers funds received and paid out each year in the course of ongoing operations of an institution. Historically, net operating funds*—the excess of operating revenues over operating expenditures—have been an important source of capital funds for many private institutions. Over the past 3 years, however, the institutions have had sharp declines in net operating funds, particularly when measured as a percentage of operating expenditures. (See Table 5.)

Table 5

Operating Revenues and Expenditures—1965-66 and 1968-69
(Millions of Dollars)

	1965-66	1968-69
Operating Revenues	$596	$792
Operating Expenditures	567	773
Net Operating Funds	29	19
Net Operating Funds as Percentage Of Operating Expenditures	5.1%	2.5%

Source: Survey

The specific causes of the decline are found in several areas of the institutions' operations. To localize precisely the individual effects of related operating and expenditure components on the private institutions' financial condition, we have grouped revenues and expenditures into major operating activities: (1) educational and general; (2) student aid; (3) sponsored research, sponsored programs, and major public service programs; and (4) auxiliary enterprises. Each of these account categories generates a contribution (which may be negative) to net operating funds. Table 6 summarizes the contributions for 1965-66 and 1968-69 and the changes that took place between those two years.

*Throughout the report, "net operating funds" will be used in referring to "excess of operating revenues over operating expenditures."

Table 6

Dollar Contributions From Major Operating Accounts
1965-66 and 1968-69
(Millions of Dollars)

	1965 66	1968-69	Change
Educational and General			
Revenue	$269.1	$355.1	+$ 95.0
Expenditure	243.9	350.1	+ 106.2
Contribution	16.2	5.0	– 11.2
Student Aid			
Revenue	28.0	41.3	+ 13.3
Expenditure	36.4	52.9	+ 16.5
Contribution	– 8.4	– 11.6	– 3.2
Sponsored Research, Sponsored Programs, and Major Public Service Programs			
Revenue	229.6	296.9	+ 67.3
Expenditure	215.6	276.7	+ 61.1
Contribution	14.0	20.2	+ 6.2
Auxiliary Enterprises			
Revenue	78.6	99.0	+ 20.4
Expenditure	71.5	93.2	+ 21.7
Contribution	7.1	5.8	– 1.3
Total			
Revenue	596.3	792.3	+ 196.0
Expenditure	567.3	772.9	+ 205.6
Net Operating Funds	29.0	19.4	– 9.6

Source: Survey

Four important conclusions can be drawn from the operating account breakdown in Table 6.

¶ **The financial contribution of the educational and general account has declined markedly**: The contribution of the educational and general category has decreased by $11.2 million in the last 3 years. The growth rates between 1965-66 and 1968-69 for each revenue and expenditure component in this category (presented in Table 7) suggest the key reason for this deterioration in the educational and general contribution. That is, each of the major educational and general expenditure items has grown faster than total educational and general revenues. In particular, instruction and departmental research expenditures,* by far the largest expenditure component, have grown at 12.5 percent per year while tuition and fees, the chief revenue component, have grown at only 10.9 percent per year.

Table 7

Educational and General Revenue and Expenditure Trends
1965-66 and 1968-69
(Millions of Dollars)

	1965-66	1968-69	Growth Rate[1]
Revenues			
Tuition and Fees	$168	$230	10.9%
Endowment Income	39	50	8.4
Gifts and Grants	40	58	12.8
Other	13	17	12.2
Total Revenues	$260	$355	10.9%
Expenditures			
Instruction and Departmental Research	$128	$182	12.5%
Library	15	23	16.0
Plant Maintenance and Operation	36	50	11.7
General, Administrative, and Student Services	55	80	13.4
Other	10	15	14.5
Total Expenditures	$244	$350	12.8%
Net Contribution	$ 16	$ 5	

[1] Annual compound growth rate over the 3-year period.

Source: Survey

*Faculty salaries account for 70 percent of instruction and departmental research expenditures.

¶ **Student aid continues to drain substantially the financial resources of the private institutions:** Student aid—the second major operating accounts category shown in Table 6—has consistently made a negative financial contribution, and the unfavorable gap between expenditures and revenues is widening. The annual growth rate in student aid revenues—from private gifts and grants, government grants, and endowment income restricted to student aid purposes—was 13.8 percent between 1965-66 and 1968-69. This revenue growth rate was slightly larger than the annual growth rate in expenditures of 13.3 percent over the same period. The slight differential was not nearly enough to allow the absolute growth in revenues ($13.3 million) to match the absolute growth in expenditures ($16.5 million).

¶ **Sponsored research, sponsored programs, and major public service programs have helped offset declining contributions in other categories—but the benefits have not been evenly distributed among all institutions:** This category includes revenues from sponsored research, other separately budgeted research, and sponsored programs that are funded by contracts from government agencies or other outside organizations. Expenditures in this category are associated with carrying out the specific projects requested by the government or organization. Revenues and expenditures are also included for major public service programs that are conducted primarily as a public or community service and are therefore not essential to meeting educational objectives.*

This third major category in Table 6 is the only one of the four that had an improved contribution in 1968-69. The $20 million contribution from these programs may be partly an accounting fiction, however. Several administrators noted that overhead is inadequately reflected in the payments the federal government makes for services.

Any real contribution that does materialize is not spread evenly among all institutions. Group VI (Harvard and MIT) obtained 80 percent of the total contribution in 1968-69, and the Group V universities received 16 percent. The 56 institutions in the other groups had a collective contribution equal to the remaining 4 percent of the total.

¶ **Auxiliary enterprises are moving towards the break-even point:** The auxiliary enterprises category includes all revenues and expenditures for activities that exist solely to furnish a service—at a fee—to students, faculty, or staff.** In all groups but Group I (2-year institutions), contribution from auxiliary enterprises declined between 1965-66 and 1968-69. The institutions in aggregate therefore moved closer to the point at which auxiliary enterprise revenues and expenditures would be equal. If this trend continues and a break-even point is reached, the contribution from auxiliary enterprises will disappear.

The widespread effect of these trends in operating revenues and expenditures is shown by the decline of net operating funds for *all* groups of private institutions over the last 3 years. We observed in the discussion of Table 5 that, measured as a percentage of operating

*For example, the Lincoln Laboratory operated by MIT for the U.S. Air Force.

**These activities include housing, food service, student stores, laundries, and intercollegiate athletics (unless operated as an integral part of the physical education department).

expenditures, net operating funds dropped from 5.1 percent in 1965-66 to 2.5 percent in 1968-69. Table 8 breaks down those aggregate percentages for each group. Groups I, II, III, and V probably suffer most from the decline because of their heavy reliance on net operating funds to finance capital expenditures.

Table 8

Net Operating Funds as a Percentage of Operating Expenditures by Group—1965-66 and 1968-69

	1965-66	1968-69
Group I	10.0%	3.9%
Group II	11.0	3.8
Group III	18.9	12.9
Group IV	0.7	– 2.4
Group V	7.2	1.3
Group VI	3.5	2.8
Total	5.1	2.5

Source: Survey

The aggregate statistics reveal only part of the effects of unfavorable financial trends. Of the 48 institutions that submitted financial data, 13 had operating deficits during 1968-69—6 more than in 1965-66. The range of those deficits as a percentage of operating expenditures was 0.3 percent to 14.5 percent, and the median was 4.9 percent. In 1965-66, the range was 1.6 percent to 7.9 percent, and the median was 3.4 percent. Thus, some institutions are facing serious and deteriorating financial situations that are masked in the presentation of aggregate statistics.

While the decline in net operating funds by itself is a significant indicator of the increasing trouble private institutions face in meeting annual operating costs, it also has impact beyond the operating budget. Because many institutions have historically relied on net operating funds as a source of funds for plant expenditures, this decline also weakens the capital accounts position. The flow of capital funds is discussed in the next section.

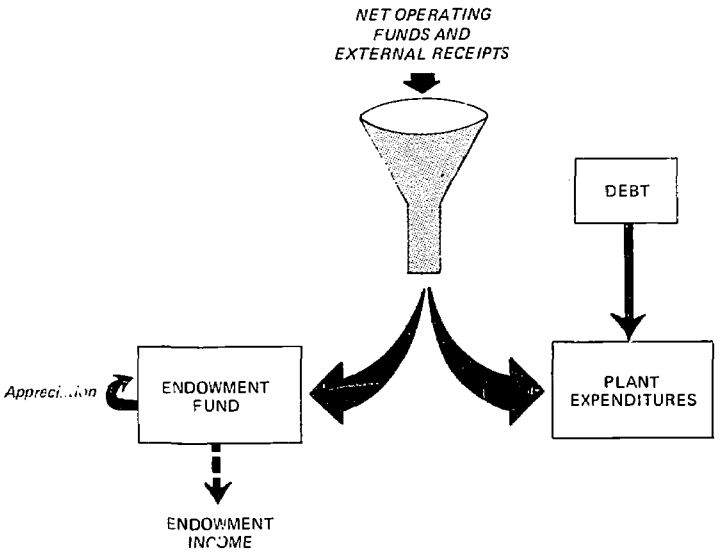
Present Status of Capital Account

In aggregate, private higher education in Massachusetts has expanded its investments in plant and endowment funds substantially since 1962. This apparently favorable development is tempered, however, by the uneven distribution of the increase among institutions and by the growing signs of future difficulties in the capital account.

The flow of capital funds in an educational institution can be represented by the diagram in Figure 5. Capital receipts flow into the institutions from external sources (e.g., through private donations for capital purposes) and from the excess of operating revenues over operating expenditures. These receipts provide funds for plant expenditures and for additions to endowment. When receipts exceed expenditures required for plant, the excess

goes to increase endowment. If capital receipts do not cover plant requirements, the institution may resort to debt—the least attractive form of financing for the institutions.

FIGURE 5
THE FLOW OF CAPITAL FUNDS



Since 1962, private institutions in Massachusetts have added almost $1.45 billion to plant and endowment—an average rate of $207 million per year. As a result, the institutions now h e endowments with total market value of almost $2 billion and physical plants with book value in excess of $1.2 billion. Table 9, however, shows that Group VI, consisting of Harvard and MIT, accounted for almost half of the total capital addition and 67 percent of the growth in endowment. Total capital accumulation for the 62 institutions in Groups I through V was $735 million, of which only $269 million was added to endowment.

Table 9

Total Capital Additions—1962 through 1969
(Millions of Dollars)

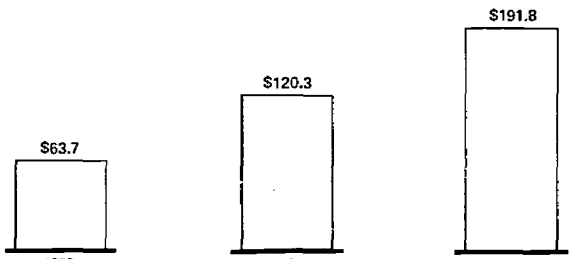
	Groups I-V	Group VI	Total
Endowment Additions (Outside Sources)	$185	$270	$455
Endowment Appreciation	84	275	359
Total Endowment Increase	$269	$545	$814
Plant Expenditures	466	169	635
Total Capital Additions	$735	$714	$1449

While the capital expansion for all private higher education in Massachusetts has been substantial, there are indications that the expansion has not been easily achieved. One indicator is the $128 million increase in debt for all institutions since 1962. (See Figure 6.) Between 1962 and 1969, the net increase in debt* was equal to 20 percent of total plant expenditures by Massachusetts private higher education.

FIGURE 6

DEBT LEVEL OF MASSACHUSETTS PRIVATE INSTITUTIONS

(Millions of Dollars)



SOURCE: *Survey*

It should not be inferred from this discussion that institutional debt is to be avoided at all costs. It is true that many institutions regard debt in any form as something to be abhorred. But other institutions–lacking the financial strength needed to afford such abhorrence–may regard debt as an appropriate means of financing assets–such as dormitories and dining facilities–that generate revenues to use in repaying the debt.

An increase in deferred maintenance at private institutions in the Commonwealth also indicates difficulty in meeting capital requirements. Deferred maintenance is the cost of major items of maintenance needed to eliminate building code violations or to raise plant to an acceptable standard of repair, given reasonable allowances for wear and tear. Thus, it measures to what extent institutions have been forced by lack of funds to accept deterioration in their physical assets.

Between 1962 and 1969, the backlog of deferred maintenance for private higher education in Massachusetts more than doubled–from $6 million to $14 million. These values are based on estimates made by the institutions. Since deferred maintenance is not an item that is reflected in institutional accounting records, the values may be subject to severe inaccuracies. The upward trend of the estimates, however, indicates the presence of financial trouble in excess of the debt accumulation disclosed by accounting data.

Overall
Financial Status

We see that the current status of operating and capital accounts presents a clear signal of growing financial problems for Massachusetts private institutions of higher education. The excess of operating revenues over operating expenditures has declined during the past several years, and, as a result, the private institutions have been able to draw on a decreasing amount of operating funds for institutional development. Even after exhausting these declining

*Net increase in debt equals new debt less repayment of principal on existing debt.

revenues from the operating account–and after drawing on capital gifts and grants–the private institutions have had to borrow heavily to build plant.

As a *summary* measure of the current status of both operating and capital accounts, debt is probably the best available indicator of the net inadequacy of funds. For the net amount of borrowing indicates the gap between how much the institutions could spend by using existing funds and how much they actually did spend. During the period 1965-69, net borrowing for Massachusetts private higher education in aggregate averaged $18 million per year.

As discouraging as this net funds need appears, it measures only the institutions' inability to cover expenditures that *were* made. A more revealing measure of overall financial status would also reflect the amount of high priority expenditures that could *not* be made by the institutions because of a shortage of funds. We have no way of estimating that amount. However, in interviews conducted during the study, several presidents of private colleges and universities did state that funds shortages had severely limited high priority programs at their institutions. We concluded, therefore, that the amount of annual debt accumulation understates the true funds shortage of the private institutions.

2–FINANCIAL PROJECTIONS

The recent history and current status of Massachusetts private higher education described in the first chapter reveal that the Commonwealth's private institutions are now encountering financial problems that could weaken their ability to continue their extraordinary growth and achievements. Projections of probable trends in institutional revenues and expenditures raise even more serious questions about the future of private higher education in Massachusetts. Our analyses indicate that the private institutions could incur deficits of approximately $20 million by 1972-73, $50 million by 1975-76, and $140 million by 1980-81; these deficits represent 1.8 percent of total expected expenditures in 1972-73, 3.6 percent in 1975-76, and 6.7 percent in 1980-81.

Projecting the finances of private institutions of higher education is a delicate task. Intricate relationships between many variables must be dealt with by means of more or less subjective judgments. Despite the inherent difficulties, we believe that the level of deficits projected in this chapter provides a valid measure of the financial problems of Massachusetts private higher education. If anything, our projections probably are somewhat conservative. They are lower, by a considerable margin, than deficits calculated by merely extrapolating historical trends in revenues and expenditures; they are also lower than deficits based on projections made by the institutions as part of the study.

Two techniques for calculating the projected values helped make them as realistic as possible. The first technique was the use of "key variables" to explain variations in major revenue and expenditure components; these components tend to increase or decrease as the result of two kinds of factors:

- ¶ **Level of activity** at an institution (e.g., as measured by student enrollment)
- ¶ **Revenue or cost per unit of activity** at an institution (e.g., library expenditures per student).

Most revenue and expenditure components can be represented as the product of these two kinds of factors, or key variables. For example, revenues from tuition and fees can be calculated with the following equation:

Tuition and Fees (1975-76)=
Tuition and Fees Per Student (1975-76) x Student Enrollment (1975-76)

In this equation, enrollment measures the activity level, and tuition and fees per student measures the revenue per unit of activity. To account for the variations in all components, 35 key variables were selected and used in the projection model.*

The second technique that promoted realistic projections was the process used in selecting growth rates for each key variable. In all, 210 growth rates were chosen–one set of 35 for each of the six groups of institutions participating in the study The selection process we used took into account three important sources of information about what might happen in the future; the sources were:

*Appendix A to this report outlines the principles of the projection model used in the study.

- ¶ **Growth rates implicit in historical data submitted by the private institutions:** Historical trends—calculated from reliable data for the years 1965-66 and 1968-69*—provided an accurate picture of what would happen if the future were no more than an extrapolation of what had taken place in the recent past.

- ¶ **Growth rates implicit in projection data submitted by the private institutions:** Trends derived from institutional estimates of major revenue and expenditure components in 1975-76 gave weight to the actual plans of the private institutions.

- ¶ **Information from independent sources:** Literature on the financial problems of higher education** and interviews with educators in Massachusetts and elsewhere supplied additional information on factors influencing the financial operations of private higher education.

To illustrate further the methodology followed in interpreting these three sources of information, we next present the growth rates selected for major variables as a basis for making projections. With the underlying assumptions identified, we then describe the projection results.

MAJOR ASSUMPTIONS ON FUTURE GROWTH

Among the numerous variables influencing future growth of private higher education in Massachusetts, some are especially important because of their impact on financial requirements. It would be unwieldy to treat in this report all 35 variables used in the projections; we present here only the growth rates selected for the most influential variables and discuss the rationale supporting the selections. The three types of variables—structural, revenue, and expenditure—are treated separately.

GROWTH RATES FOR STRUCTURAL VARIABLES

Structural variables, as we defined them, are those variables that establish the key characteristics of an institution of higher education and are therefore important determinants of the size of most revenue and expenditure components. The structural variables are: (1) enrollment; (2) undergraduate enrollment as a percentage of total enrollment; and (3) student-to-faculty ratio. Because it governs so many financial elements, the enrollment variable is discussed in detail in the next section; the remaining two structural variables are then treated jointly.

Enrollment

The level of enrollment maintained by an institution of higher education can be planned and controlled within reasonably narrow limits. Therefore, the growth rates for FTEE submitted by the institutions participating in the study were given heavy weight in our

*This pair of years was selected for two reasons: (1) the span between them is long enough to allow calculation of a meaningful trend; and (2) the period covered is current enough to give the greatest weight to recent factors affecting the revenues and costs of private higher education (e.g., inflation).

**For example, the analyses of voluntary support prepared by the Council for Financial Aid to Education.

enrollment projections. Table 10 shows, for each group of institutions, the growth rate implicit in historical data, the growth rate projected by the institutions, and the rate we selected for our projections.

Table 10

Enrollment Growth Rates for Each Group

	Historical Rate	Institutional Projection Rate	Selected Rate
Group I	-2.4%	2.7%	2.0%
Group II	2.2	4.6	3.4
Group III	5.9	3.2	3.2
Group IV	1.7	2.0	2.0
Group V	4.2	2.1	2.1
Group VI	0.8	0.5	0.5

Growth rates selected for Groups III, IV, V, and VI are the same as the rates submitted by the institutions and reflect our reliance on institutional projections as the best indicator of future enrollment trends. Selected rates for Groups I and II, however, are lower than rates evident in the institutional projections.

In Group I, two factors influenced the selection of the growth rate to be used in our projections. First, interviews with representatives of the 2-year institutions making up the group disclosed that some schools are operating below capacity because of the historical decline in enrollment. To ensure full capacity in the future, the largest Group I institution has effected enrollment policy changes that make some rise in enrollment highly probable. This reaction to undercapacity partially explains the 2.7 percent rate implicit in the institutional projections. But the growing strength of the public community college system—the second factor—will continue to exert enough competitive pressure on Group I institutions to make the 2.7 percent rate, in our judgment, overly optimistic; therefore, we have scaled it down, somewhat arbitrarily, to 2 percent.

Group II's low response, in comparison with the other groups, to the request for institutional projections caused its growth rate to be overinfluenced by the expansion plans of a single large school. Because the growth planned by the other specialized schools was probably not as large, a value of 3.4 percent—midway between the historical rate and the projection rate—was selected.

Other Structural Variables

Growth rates for all six groups were presented for the enrollment variable because of the widespread impact of enrollment on the financial positions of institutions of higher education. For all other variables discussed in this chapter, growth rate selections will be illustrated only for Group V—the universities excluding Harvard and MIT. Group V was selected because it has by far the largest enrollment of any group—accounting for 43 percent of total private enrollment in Massachusetts. This section presents Group V growth rates for:

¶ Undergraduate enrollment as a percentage of total enrollment

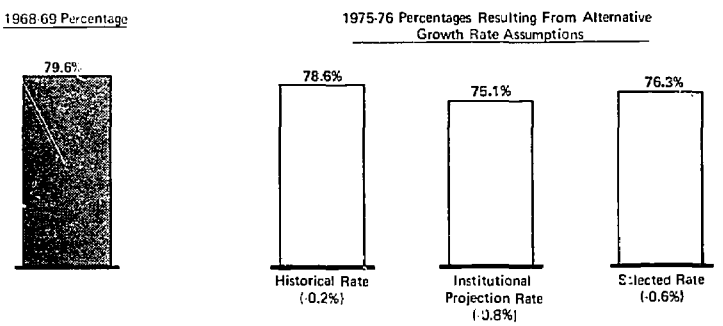
¶ Student-to-faculty ratio.

Undergraduate enrollment as a percentage of total enrollment measures the relative emphasis on undergraduate education versus graduate education in an institution. Figure 7 gives the percentage of total enrollment represented by undergraduates for 1968-69, and the percentage that would be obtained for 1975-76 by using the three alternative Group V growth rates for this variable.

FIGURE 7

UNDERGRADUATE FTEE AS PERCENTAGE OF TOTAL FTEE

Group V



Since 1965-66, Group V universities have reduced emphasis on undergraduate programs from 80.1 percent to 79.6 percent of total FTEE, a rate of decline of –0.2 percent a year; conversely, the proportion of total enrollment accounted for by graduate students has increased during that time.* According to the projected growth rate, Group V expects to accelerate substantially this expansion of its graduate programs relative to undergraduate programs. Because of the cost implications of such graduate school expansion, and in view of the financial strain already experienced by Group V,** we used a growth rate of –0.6 percent as a basis for projecting this variable.

In treating the final structural variable—student-to-faculty ratio—we expressed the student values in terms of FTEE that had been weighted to reflect the wide variations in the costs of educating different kinds of students. Graduate students, for example, require lower student-to-faculty ratios than do undergraduates. In this study, the weights used for calculating weighted FTEE were: 0.5 for extension students; 1.0 for undergraduate students; and 2.0 for graduate students.***

The denominator of the student-to-faculty ratio was expressed in terms of full-time equivalent faculty (FTEF). The FTEF measure, as defined in this study, reduces all faculty members to an equivalent number of full-time faculty members employed for a 9-month

*Also included among nonundergraduates is a limited number of extension students.

**Net operating funds as a percentage of operating expenditures for Group V, for example, dropped from 7.2 percent to 1.3 percent between 1965-66 and 1968-69. (See Chapter 1, Table 8.)

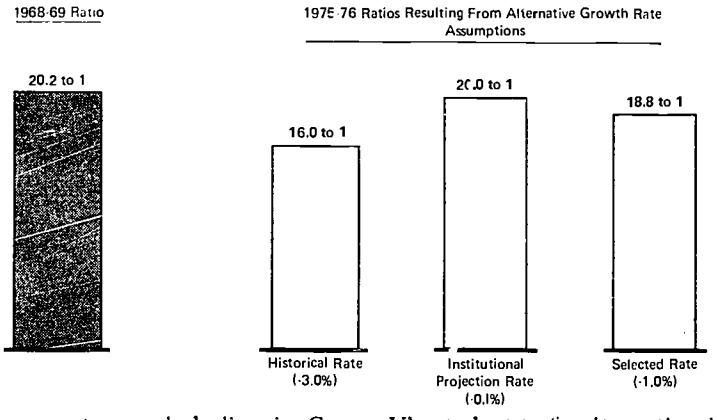
***Because this definition of student-to-faculty ratio is not common, we urge caution in comparing values presented in this report with student-to-faculty ratios reported elsewhere. Appendix A provides further discussion of the values used in weighting FTEE.

year. Faculty in administrative posts (e.g., registrar) were not included in FTEF. Figure 8 presents student-to-faculty ratios based on alternative growth rates for Group V.

FIGURE 8

STUDENT-TO-FACULTY RATIO

Group V



The 3.0 percent annual decline in Group V's student-to-faculty ratio since 1965-66 would, if it continued, produce a 16 to 1 ratio (i.e., 16 students for each faculty member) by 1975-76. Group V has projected practically no change in the current ratio of 20.2 to 1, however. Despite the high cost of lowering the ratio further, faculty demands and increasing student requests for more individualized attention—both of which have undoubtedly influenced the recent downward trend—will most likely continue to exert pressure on the ratio. Weighing the various influences, we decided on a moderate decrease of 1.0 percent in the student-to-faculty ratio.

GROWTH RATES FOR REVENUE VARIABLES

Private institutions of higher education obtain revenues for two distinct purposes: (1) operations and (2) capital improvement. The following sections present growth rates for Group V's major operating and capital revenue variables.

Operating Revenue Variables

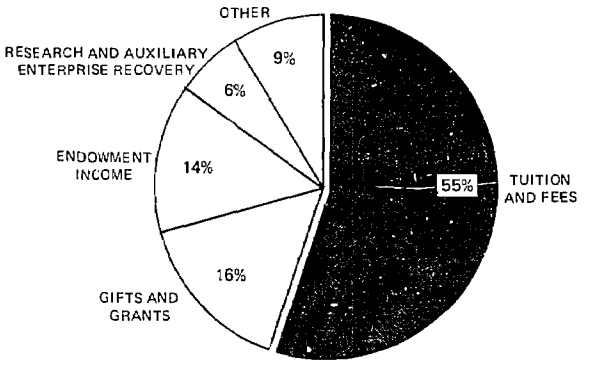
The principal sources of operating revenue for educational institutions are: (1) tuition and fees; (2) private gifts and grants; (3) endowment income; and (4) activities not directly related to the institution's basic educational functions (e.g., sponsored research and auxiliary enterprises). In the fourth revenue source, each activity has revenues and expenditures that can clearly be associated with one another; the financial impact on the institution is determined by how much the revenue from the activity exceeds the expenditure. This excess of revenue over expenditure—often termed "recovery"—generates a contribution that the institutions may use for their basic educational functions.

Figure 9 summarizes the relative importance of the various sources in providing operating revenue for educational purposes. Tuition and fees, private gifts and grants, and endowment

income are the most important by a wide margin—accounting for 85 percent of the total. We shall focus our discussion of revenue assumptions on these three important revenue variables.

FIGURE 9

SOURCES OF OPERATING REVENUES*
1968-69



Revenues from research, sponsored programs, and auxiliary enterprises are included only to the extent that they exceed expenditures for those purposes.

To determine the future size of revenues from major sources, we broke down each source, when required, into the key variables influencing its growth. The following growth rates were selected for Group V's operating revenue variables.

¶ **Tuition and fees per student: 6.0 percent.** Revenue from tuition and fees is calculated as tuition and fees per student multiplied by total enrollment (discussed earlier in this chapter). Group V institutions have increased tuition charges per student by 7.7 percent per year since 1965-66—a growth rate well above the 3.4 percent growth in per capita disposable income during that period. Perhaps recognizing the difficulty of maintaining such rapid growth, the institutions projected a 4.7 percent growth rate for tuition charges per student through 1975-76. This projected rate is a precipitous change from recent history and seems too slow in light of increasing financial pressures; we selected a rate of 6.0 percent as a basis for the projections.

¶ **Yield on endowment market value: 0.0 percent.** Endowment income equals yield on endowment market value multiplied by endowment market value.* Our analysis of data from the institutions provided no persuasive reason for assuming that yield would differ from the most recent experience. Therefore, we selected a growth rate of zero.

¶ **Private gifts and grants: 8.0 percent.** Private giving to Massachusetts private higher education has grown rapidly in the recent past; Group V's high historical rate of 10.8 percent was actually second lowest for all groups. However, Group V projected a growth rate of only 6.8 percent in private giving. Administrators at the private institutions offered strong arguments why the growth in private giving in the future will be slower than in the past. They noted, for example, that the principal

*Endowment market value is discussed in the section on growth rates for capital revenue.

private sources for many schools have been tapped and that other competitors for the philanthropic dollar are drawing support away from higher education. But the projected drop seems too drastic. Allowing for the often conservative bias of fund-raising estimates and recognizing some possibility for broadening the base of private contributions,* we selected a growth rate of 8.0 percent for Group V.

Capital
Revenue Variables

Funds for capital purposes come primarily from: (1) excess of operating revenues over operating expenditures; (2) gifts and grants for plant and endowment; and (3) appreciation of the endowment fund. The first source is based directly on the operating account projections, which we have already covered. This section covers growth rates only for capital gifts and grants and endowment appreciation; for those variables, the following rates were selected.

- ¶ **Capital gifts and grants: 6.5 percent.** Because capital gifts and grants are often sought in major fund drives, there are exceedingly wide swings in funds obtained from year to year. To dampen the effects of these fluctuations, capital gifts and grants for the last 4 years were averaged to estimate the current average *level* of support. Outside information sources—particularly the annual survey of voluntary support prepared by the Council for Financial Aid to Education (CFAE)—were used to estimate the future *trend* in capital gifts and grants. The CFAE calculates the trend in gifts for physical plant each year; since 1957-58, this figure has averaged 6.5 percent. The CFAE has also reported that donors are tending to contribute a larger share for operating purposes and a smaller share for capital purposes than they have in the past. In light of this trend, we believed the CFAE's average of 6.5 percent—lower than our selection of 8 percent growth in operating private gifts and grants—was an appropriate assumption for the future growth rate in capital gifts and grants.
- ¶ **Endowment appreciation: 4.5 percent.** Massachusetts private institutions in aggregate have averaged a 3.3 percent appreciation since 1962-63. Increasing attention to endowment fund performance and the growing emphasis on long-term total return rather than current income** should exert an upward pressure on this rate in the future. Hence 4.5 percent, somewhat higher than the historical rate, was selected as the basis for projections.

GROWTH RATES FOR EXPENDITURE VARIABLES

Like revenues, expenditures of educational institutions are analyzed most appropriately by treating operating and capital costs separately. In the following sections growth rates are presented for the major expenditure variables; institutions in Group V are again used for illustrative purposes.

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*Chapter 3 will discuss the possibilities of further improvement of revenue sources and will treat the environmental factors affecting private giving in more detail.

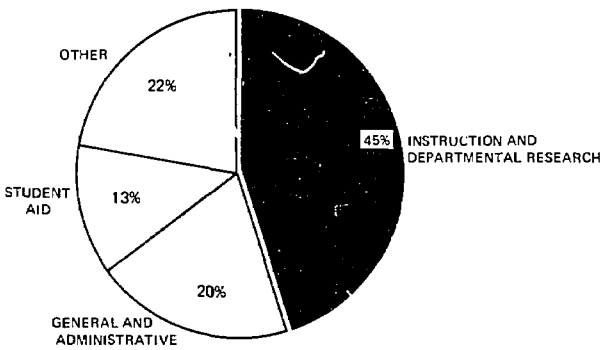
**These trends for endowment income yield and endowment appreciation have been heavily influenced by the current enthusiasm over (1) studies by the Ford Foundation and other groups and (2) the fine endowment performance attained by some schools—e.g., the University of Rochester.

Operating
Expenditures Variables

As Figure 10 shows, private institutions spend 45 percent of total operating outlays to cover the cost of instruction and departmental research. In the projections of future levels of expenditures for instruction and departmental research, that component was broken down into three key variables: (1) FTEF*; (2) compensation per FTEF; and (3) ratio of total instruction and departmental research expenditures to compensation. FTEF is the product of FTEE and the student-to-faculty ratio, both of which were discussed earlier in this chapter. This section discusses growth rates for the last two variables influencing instruction and departmental research costs and for two other important operating expenditure variables: (1) general administrative, general institutional, and student services expense and (2) student aid.

FIGURE 10

OPERATING EXPENDITURES* 1968-69



**Excludes sponsored research, other sponsored programs, and auxiliary enterprises.*

¶ **Compensation per FTEF: 6.2 percent.** Group V's historical trend in compensation per FTEF was 6.2 percent; its projected trend was 6.7 percent. While compensation levels are subject to upward pressures, they are also subject to the constraints imposed by increasingly scarce resources. In view of the stringent financial situation faced by Group V institutions, we believe they would do well to maintain the recent trend of 6.2 percent.

¶ **Ratio of total instruction and departmental research expenditures to compensation: 1.0 percent.** This ratio indicates by how much total expenditures for instruction and departmental research exceed faculty compensation. For Group V institutions this ratio is 1.30, which means that they spend an amount equal to 30 percent of total faculty compensation for other purposes (e.g., salaries for faculty secretaries and research assistants, travel). This ratio for Group V has been growing at a rate of 1.7 percent annually, but the Group V institutions project growth of only 0.4 percent per year in the future. It is true that administrators may be forced by financial pressures to try to slow the rapid rate of increases in nonfaculty costs of instruction and departmental research. But we believe the downturn in this growth rate projected by Group V institutions is too optimistic. Our interviews

*Full-time equivalent faculty.

suggest that faculty will most likely press for added support funds in the future as strongly as they have pressed for improved salary increases in the past. We arrived at a growth rate of 1.0 percent, which is the average of the historical rate and the rate projected by the institutions.

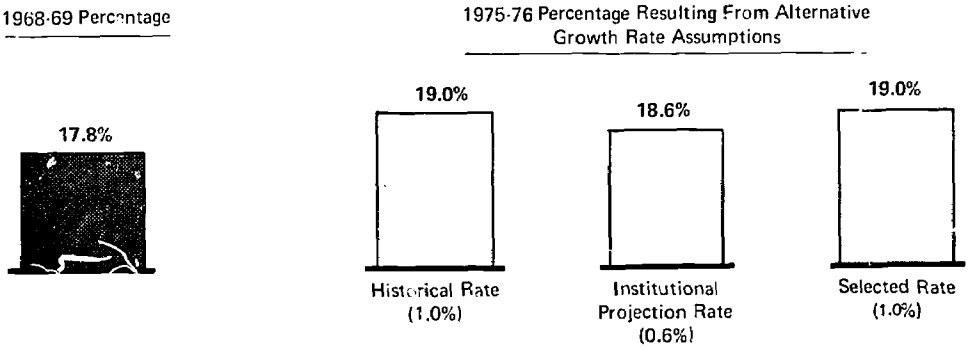
¶ **General administration, general institutional, and student services expenditures per student: 7.0 percent.** General expenditures equal general expenditures per student multiplied by enrollment. Group V's historical rate for general expenditures per student was 10.5 percent while the rate projected by Group V institutions was only 3.6 percent. This precipitous reduction was difficult to accept in light of continuing pressure for increased student services and higher administrative salaries. Moreover, this expenditure component is much more difficult to plan accurately than are structural variables, for example. We therefore used the average of the historical and projected rate.

¶ **Ratio of student aid to tuition: 1.0 percent.** Student aid expenditures are projected by multiplying the ratio of student aid expenditures to tuition by projected tuition charges.* A growth rate of zero in the ratio means that student aid expenditures would grow at exactly the same rate as tuition; a positive growth rate means that student aid will grow faster than tuition.

Figure 11 shows the resultant ratio of student aid to tuition in 1975-76 under three assumed growth rates. Group V's historical growth rate for this ratio was 1.0 percent; its implied projected rate is 0.6 percent. However, we feel that increasing pressures to enroll and support disadvantaged students—and perhaps middle income students, too—will work against a reduction in the historical trend. Therefore, the historical rate of 1.0 percent was used in making the study projections.

FIGURE 11

STUDENT AID EXPENDITURES AS PERCENTAGE OF TUITION



*Tuition growth rates have already been presented in the chapter.

Capital Expenditures

Capital funds are used for improving and expanding plant and for increasing endowment.* We have already discussed the rate of endowment appreciation, all of which is assumed to be retained in the endowment fund. We also assumed that investment in endowment over and above endowment fund appreciation would take place only after required plant expenditures were made. Only growth rates for plant expenditures are presented here.

Total plant space required by an institution in a given year was analyzed as weighted FTEE multiplied by amount of space per weighted FTEE. To project plant expenditures, we first calculated total plant needed in the projection year on the basis of the projected levels of weighted FTEE and amount of space per weighted FTEE.** Then, by subtracting the current total plant space from the projected total plant space, we determined how much plant must be added over the entire period and calculated the average plant expenditure required per year. Finally, we adjusted the average annual expenditure on plant to account for an annual inflation rate of 4 percent.***

For Group V, plant space per student has grown at a rate of 0.2 percent; the rate implicit in institutional projections was -0.4 percent. In projecting physcial plant additions, educational institutions tend to include expenditures of construction projects already planned and to omit estimates of unanticipated needs. To allow for this tendency and to give some weight to the historical trend, we selected an average of those rates as a basis for the projections developed in the study.

RESULTS OF FINANCIAL PROJECTIONS

The selection of growth rates for use in forecasting financial trends was, as illustrated in the preceding section, a somewhat imprecise and complex process involving the balancing of conflicting indicators. To provide some measure of the effect of the study's growth rate assumptions in relation to historical and projected trends, we calculated and compared operating account projections for 1975-76 based on three sets of assumptions:

- ¶ Growth rates implicit in historical data
- ¶ Growth rates implicit in institutional projections
- ¶ Growth rates we used in making our study projections.

As shown in Table 11, the resulting projections indicate that a serious operating funds deficit would occur under all sets of assumptions. The direct historical projections would produce the largest deficit, owing in part to the rapid enrollment growth that took place in the recent past. Enrollment growth rates included in the other two sets of projections are significantly lower. When the historical growth rate is modified to equal the rate assumed in our projections, the deficit projected from historical trends becomes $70 million, still well above the study projection value.

*See the flow chart in Figure 5 of Chapter 1.

**The trend in plant space per weighted FTEE was approximated by adjusting trends in book value per weighted FTEE to account for the failure of book value to keep pace with replacement value.

***This inflation estimate seems conservative in light of the recent growth in building costs but reflects our expectations concerning inflation over the next 12 years.

Table 11

Comparison of Operating Funds Deficits
1975-76

	Operating Funds Deficit (Millions of Dollars)	Operating Funds Deficit As Percentage of Operating Expenditures
Direct Historical Projections	$79.8	5.0%
Institutional Projections	48.1	4.0
Study Projections	31.1	2.5

The study projections—although more conservative than the projections based on historical data and institutional plans—still indicate serious financing problems in the future. Tables 12, 13, and 14 summarize the projection results for each group for the three years 1972-73, 1975-76, and 1980-81. As those tables show, private higher education in Massachusetts is projected to incur total deficits of $22 million in 1972-73, $53 million in 1975-76, and $138 million in 1980-81. In those tables, the term "net total funds" summarizes the overall funds shortage by combining net operating funds with net shortage of capital funds.*

Table 12

Projected Net Operating, Capital, and Total Funds
By Group—1972-1973
(Millions of Dollars)

Group	I	II	III	IV	V	VI	TOTAL
Net Operating Funds[1]	0	$0.4	$6.5	−$5.3	−$8.1	$3.3	$3.2
Net Operating Funds As Percentage of Operating Expenditures	0	1.6%	11.1%	−4.6%	−3.1%	0.6%	−0.3%
Net Capital Funds[2]	0	−$3.7	−$5.1	−$3.4	0	−$6.5	−$18.7
Net Capital Funds As Percentage of Capital Expenditures[3]	0	−61.7%	−55.2%	−8.1%	0	−7.0%	−10.0%
Net Total Funds	**0**	−$3.3	$1.4	−$8.7	−$8.1	−$3.2	−$21.9
Net Total Funds As Percentage of Total Expenditures	**0**	**−10.4%**	**2.0%**	**−5.6%**	**−2.8%**	**−0.5%**	**−1.8%**

[1] *Net operating funds are defined as operating revenues less operating expenditures.*

[2] *Net capital funds are defined as capital gifts and grants less plant expenditures; they are never positive because any excess gifts and grants are assumed to be invested in endowment.*

[3] *Capital expenditures include plant expenditures and additions to endowment.*

*Net shortage of capital funds—a negative number—equals capital gifts and grants less projected annual plant expenditure requirements.

Table 13

Projected Net Operating, Capital, and Total Funds By Group–1975-1976

(Millions of Dollars)

Group	I	II	III	IV	V	VI	TOTAL
Net Operating Funds[1]	–$1.3	–$0.1	–$7.2	–$8.2	–$21.6	–$7.1	–$31.1
Net Operating Funds As Percentage of Operating Expenditures	–2.8%	–0.2%	9.6%	–5.9%	–6.3%	–1.2%	–2.5%
Net Capital Funds[2]	0	–$4.9	–$6.4	–$4.2	0	–$6.7	–$22.2
Net Capital Funds As Percentage of Capital Expenditures[3]	0	–64.0%	–56.0%	–8.5%	0	–6.2%	–10.1%
Net Total Funds	**–$1.3**	**–$5.0**	**$0.8**	**–$12.4**	**–$21.6**	**–$13.8**	**–$53.3**
Net Total Funds As Percentage of Total Expenditures	**–2.3%**	**–12.0%**	**0.9%**	**–6.6%**	**–5.7%**	**–1.9%**	**–3.6%**

[1] *Net operating funds are defined as operating revenues less operating expenditures.*

[2] *Net capital funds are defined as capital gifts and grants less plant expenditures; they are never positive, because any excess gifts and grants are assumed to be invested in endowment.*

[3] *Capital expenditures include plant expenditures and additions to endowment.*

Table 14

Projected Net Operating, Capital, and Total Funds By Group-1980-81

(Millions of Dollars)

GROUP	I	II	III	IV	V	VI	TOTAL
Net Operating Funds[1]	–$4.9	–$1.7	$7.6	–$14.3	–$60.4	$36.5	–$110.2
Net Operating Funds As Percentage of Operating Expenditures	–7.2%	–3.4%	6.7%	–7.2%	–11.5%	–4.4%	–6.2%
Net Capital Funds[2]	0	–$6.9	–$8.6	–$5.6	0	–$7.0	–$28.1
Net Capital Funds As Percentage of Capital Expenditures[3]	0	–66.1%	–56.9%	–8.9%	0	–5.4%	–10.2%
Net Total Funds	**–$4.9**	**–$8.7**	**–$1.0**	**–$19.9**	**–$60.4**	**–$43.5**	**–$138.4**
Net Total Funds As Percentage of Total Expenditures	**–6.2%**	**–13.9%**	**–0.8%**	**–7.6%**	**–10.5%**	**–4.6%**	**–6.7%**

[1] *Net operating funds are defined as operating revenues less operating expenditures.*

[2] *Net capital funds are defined as capital gifts and grants less plant expenditures; they are never positive, because any excess gifts and grants are assumed to be invested in endowment.*

[3] *Capital expenditures include plant expenditures and additions to endowment.*

From the three tables of projections, we have drawn several conclusions:

¶ **Institutional operating accounts will show the most severe deficits by 1975-76.** Although net operating funds will only be slightly negative in 1972-73, a sharp rate of decline is projected. The future compound growth rate in revenues is projected to be 0.7 percentage points below the growth rate for operating expenditures. This differential would drive the operating account deficit to $110 million by 1980-81.

¶ **Projected capital deficits are not expected to grow rapidly.** Capital deficits occur when capital gifts and grants cannot cover plant expenditures. Only four of the groups are projected to have capital deficits. In those four groups, the level of capital gifts and grants in the base year was substantially lower than plant expenditures for the same year. As a result, capital gifts and grants growing at the assumed 6.5 percent rate will not catch up by 1981 with plant expenditures growing at the 4 percent inflation rate. Therefore, the total deficit is projected to climb during the projection period despite the favorable growth rate differential between revenues and expenditures.

¶ **Group V - the private universities exclusive of Harvard and MIT - will face large deficits in all 3 projection years.** Group V has the highest enrollment of all six groups of institutions and accounts for 43 percent of total FTEE in the private sector of higher education in Massachusetts. As might be expected, its deficits, particularly in the longer term, are projected to be large. By 1975-76, the Group V deficit is projected to reach 41 percent of the aggregate 1975-76 deficit for all private institutions. The closeness of Group V's deficit share and its enrollment share suggests that the severity of the large Group V deficits, when measured per student, approximates that of the other groups. We point out, however, that no plant deficit is projected for Group V as a result of the low expectation of institutions in that group for increasing plant space per student. We assumed a decline of 0.1 percent per year in this variable, the lowest for any group. Group V deficits would be significantly greater if more plant expenditures were planned.

¶ **Group II will face the most severe 1975-76 deficit relative to its level of expenditures.** As a percentage of projected expenditures, the projected net total deficit of the specialized colleges in the 1975-76 is 12.0 percent--more than 5 percentage points higher than the nearest group. In Group II, as contrasted with the aggregate picture, the capital account is responsible for almost all of the deficit. To accommodate their enrollment growth rate,* which is the highest of all groups, Group II institutions projected average annual plant expenditures considerably higher than their capital receipts. Their capital problems are accentuated because net operating funds are not projected to provide capital funds in the future as they have in the past.

¶ **Group III is projected to have a favorable balance in net total funds; Group I, only a modest deficit in 1975-76.** Groups I and III have historically operated with limited resources. As a result, they generally have lower faculty salaries, higher student-to-faculty ratios, and more modest student aid programs than the other

*Group II's projected enrollment growth is 3.4 percent.

groups. This modest level of resources per student, combined with limited aspirations inherent in their institutional projections, led to the two most favorable financial positions. These favorable results may be somewhat illusory, however. We would not expect any net total surplus to materialize because these institutions will most likely use the funds to improve their faculty salaries, student-to-faculty ratios, and student aid programs.

¶ **Groups IV and VI - generally comprising institutions with strong financial resources - have large projected deficits.** Several of the institutions in these two groups are among the most prestigious of the nation's colleges and universities. In part, their reputations are based on continually making costly improvements in their educational programs. But, as the projections suggest, continuing rates of progress will become increasingly difficult; for some, it may become impossible without altering in some way their traditional roles.*

¶ **All groups could face deficits by 1980-81.** In the absence of some form of financial support not now apparent (e.g., from the federal government), the differential in growth rates between costs and revenues will carry every group into a deficit position by 1980–81.

Deficits of the size described in this chapter represent a strong challenge to the continued vitality of Massachusetts private higher education. In the next chapter we consider alternative means of coping with those deficits.

*For example, some all-men or all-women colleges will more than likely be forced by financial and other pressures to become coeducational institutions.

3–ALTERNATIVE METHODS OF FINANCING FUTURE REQUIREMENTS

Confronted by severe shortages in available funds, educational administrators would ideally prefer to balance their budgets by increasing the flow of revenue from outside sources rather than by cutting back expenditures. Substantial growth in funds from private gifts and grants and from federal and state programs–beyond the growth assumed in making the study projections–would allow the private institutions to keep planned resource allocations intact. We do not believe, however, that these sources can be expanded at the rate needed to avoid projected deficits. In the first half of this chapter, we explain why we have reached this conclusion.

Without substantial relief from external sources, many private institutions will be forced to make internal policy decisions that, while relieving their financial strain, could seriously narrow the scope of educational opportunity available to residents of Massachusetts. In the second half of this chapter, we discuss the nature and impact of those internal policy decisions.

LIMITS ON EXTERNAL SOURCES OF REVENUE

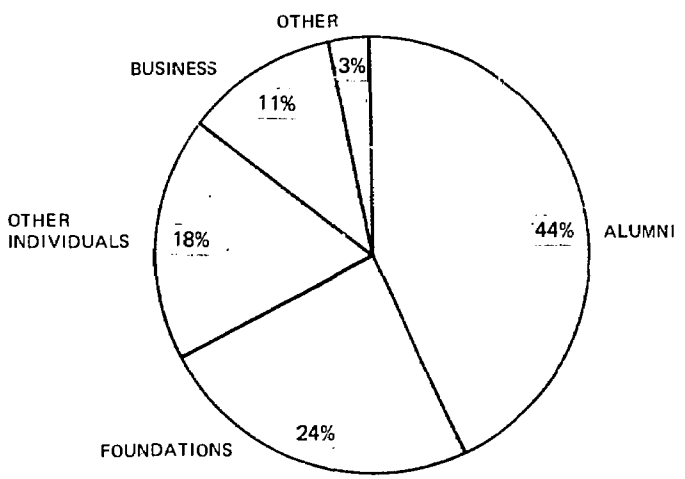
Unfortunately, the amount of funds received from external sources is determined by more than the private institutions' efforts to obtain increased financial support from those sources. In the sections that follow we describe the factors limiting future growth in funds from the three major external sources of revenue: private gifts and grants; federal support; and state support.

Private Giving

The principal sources of private gifts and grants are alumni, other individuals (e.g., parents of students), general welfare foundations, and businesses. Private giving to Massachusetts private higher education in 1967–68 was distributed as shown in Figure 12.

FIGURE 12

SOURCES OF PRIVATE GIFTS AND GRANTS TO MASSACHUSETTS PRIVATE INSTITUTIONS - 1967-68



SOURCE: *Voluntary Support of Education, 1967-68, Council for Financial Aid to Education.*

We projected growth rates for private gifts and grants ranging from 6.5 percent to 8.0 percent for the six groups; these rates were lower than historical rates but higher than the growth predicted by the institutions. While we believe that all private institutions should continue to do everything possible to improve their success with private donors, we do not expect that they will be able to exceed the growth rates used in making our projections for several reasons.

¶ **Principal private sources have already been tapped.** Our discussions with representatives of the private institutions in Massachusetts revealed that most schools had greatly upgraded their development staffs over the last few years. Moreover, their staffs have made intensive efforts to maximize support received from the principal known sources of private gifts and grants. With few exceptions, administrators are not optimistic about developing new prospects for private giving.

¶ **Per capita contributions for all forms of charitable purposes, including education, are declining.** Average philanthropic gifts of persons with adjusted incomes of $10,000 or more declined steadily from $745 in 1960 to $545 in 1966.*

¶ **Other competitors for the philanthropic dollar are drawing support away from higher education.** Most sources of support—the foundations in particular—have altered their patterns of giving in recent years and are now devoting a larger share of their grants to such areas as urban assistance programs. As a result of this trend, foundation support to the private institutions in Massachusetts decreased from $36.2 million in 1965-66 to $34.0 million in 1967-68.** Because expenditures at those institutions were climbing rapidly over the period, the portion of institutional costs covered by foundation support has declined substantially.

¶ **Businesses and corporations focus a limited amount of support on a few institutions.** The Council for Financial Aid to Education reported that businesses nationally have steadily increased the level of support to higher education over recent years. Although this trend would appear to be a hopeful sign for the future, two factors suggest that increased business assistance will have a limited impact on projected financial deficits. First, business currently accounts for only 11 percent of total private support (Figure 12); even a large increase would have only a small effect on total private giving. Second, several administrators pointed out during the study that corporate support tends to be unevenly distributed. Apparently, corporations typically favor institutions that are fertile recruiting sources or that operate research programs directly relevant to corporate research or production activities. Many of the smaller institutions that are unable to offer a tangible quid pro quo receive little or no support from business.

¶ **Campus unrest may serve to lower individual giving.** Campus controversy was cited as the cause of a downturn in the number of donors at some institutions. There is concern among development officers that the effects of campus unrest may be severe and long lasting—especially on more senior alumni (who tend to make large donations) and on parents of students and recent graduates.

*_Statistics of Income, Individual Income Tax Returns_, 1960 and 1966, Internal Revenue Service, U.S. Treasury Department.

**_Voluntary Support of Education, 1967-68_, Council for Financial Aid to Education.

¶ **Recent federal tax legislative proposals pose a new threat to private giving.** In the first session of the 91st Congress, tax reform proposals were hotly debated. One proposal—to apply a 4 percent tax on the net investment income of private foundations—was passed. This new tax burden on the foundations could serve to reduce even further their diminishing support of higher education.*

In view of the factors just discussed, we can find no basis for assuming that the projected level of deficits will be significantly reduced through growth in private gifts and grants at a higher rate than the rate we assumed in making our projections.

Federal Support Programs

Massachusetts private higher education has, as a whole, benefited significantly from funds supplied by the federal government. The private institutions received $210 million in 1967.** These funds—largely for research—have created tremendous opportunities for enhancing the educational environment of the institutions, particularly by attracting highly qualified faculty and fostering outstanding graduate programs. The presence of federally supported research projects has undoubtedly helped raise the overall quality of education in Massachusetts.

Despite this overall contribution, federal funds have done little to alleviate the growing financial problems of many Massachusetts private institutions of higher education. The limited financial impact is principally the result of two factors. First, the uses of federal funds are, in general, restricted to specific programs—such as research and development—that require institutions to provide particular services in return for grants received. Research and development programs alone accounted for over 65 percent of total awards to Massachusetts private colleges and universities in 1967.** As a result, most federal programs generate direct financial contributions to educational activities only to the extent they provide funds to cover overhead expenses beyond costs actually incurred under the programs.

Recovery for overhead from sponsored research and other sponsored programs—primarily supported by federal funds—reached $20 million in 1968-69. But most administrators consider federal research contracts to be, at best, break-even operations—a situation that will change only if the government increases the recovery rate for sponsored research. Although there have been suggestions to this effect,*** current pressures on federal research and development budgets make early improvement highly improbable.

The second factor limiting the financial impact of federal funds is the unevenness in their distribution among the private colleges and universities. As Figure 13 shows, Harvard and

*Tax proposals with even more serious implications for private giving were suggested but not passed. In particular, a proposal was made to impose a tax on the appreciated value of donated property, including securities—a form in which large private contributions to higher education are often made.

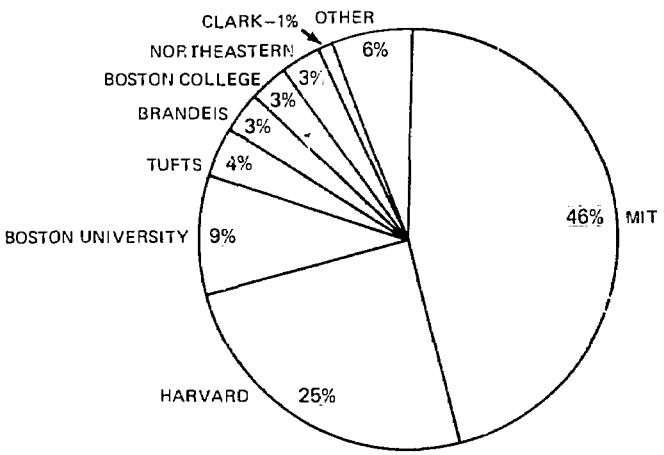
***Federal Support to Universities and Colleges, Fiscal Year 1967;* National Science Foundation.

***In the report of the U.S. Department of Health, Education and Welfare entitled *Toward a Long Range Plan for Federal Financial Support for Higher Education,* January 1969, the department proposed that the federal government provide a "sustaining grant" equal to a percentage of the federal research awards and usable for either research or teaching purposes at the institution's discretion. This recommendation would have an effect equivalent to increasing the recovery rate, but thus far it has not been implemented.

MIT received 71 percent and the six Group V universities received 23 percent of all federal funds distributed to Massachusetts private institutions in 1967. The remaining 56 institutions collectively received only 6 percent of federal funds in that year.

FIGURE 13

FEDERAL FUNDS DISTRIBUTED TO MASSACHUSETTS PRIVATE INSTITUTIONS IN 1967



SOURCE: *Federal Support to Universities and Colleges, Fiscal Year 1967; National Science Foundation*

Recognizing the limited value of current federal programs in overcoming financial problems of higher education, educational and government leaders are exploring more effective means of channeling funds to educational institutions. Acceptance is growing for the idea that the federal government bears substantial responsibility for ensuring the continued vitality of the nation's higher educational system. For example, the Department of Health, Education and Welfare has stated[1] "that there is clearly a need for increasing the flow of federal resources to higher educational institutions in the future." A recent Carnegie Commission report[2] also makes a strong case for greater federal support.

This plea for increased federal responsibility for higher education is encouraging, but increased federal assistance in forms that will benefit a broader range of institutions is not now in sight. In fact, educators are even worried that present levels of support in existing forms will not be maintained. An article in *The New York Times* reported that "federal budget cuts appear to be causing alarm that sometimes almost approaches panic among scientists and educators."[3] *The Wall Street Journal* –discussing the "outright crunch in the back-to-school loan market"–cited that "federal help programs are leveling off after years of expansion, and some major ones are even being cut back by the Nixon Administration and Congress."[4] It is our opinion that the private institutions in Massachusetts cannot rely

[1] In the report, *Toward a Long Range Plan for Federal Support of Higher Education*, January 1969, U.S. Department of Health, Education and Welfare.

[2] Quality and Equality: New Levels of Federal Responsibility for Higher Education, *Carnegie Commission* on the Future of Higher Education, December 1968.

[3] "Inflation and Budget Cuts Cause Alarm Among Scientists Seeking Research Funds," *The New York Times*, October 5, 1969.

[4] "College Crisis–Many Students Unable To Find Enough Money for School This Year," *The Wall Street Journal*, August 19, 1969.

in the short term on the federal government to provide assistance appreciably greater than the support they now receive.

State Support Programs

The private sector of higher education in Massachusetts has thus far not benefited significantly from state assistance. The only program now providing even indirect support for private institutions is the General Scholarship Program, through which Massachusetts provides scholarship aid for needy and academically qualified Massachusetts residents. This program provides relatively little assistance to the private institutions for two reasons.

First, the scholarship program's primary objective is to help students; any benefit provided to the private institution is indirect. When the student receiving a state scholarship brings it to his selected school, the institution benefits financially only insofar as the scholarship reduces the amount the institution would otherwise grant to that student.

The second reason for the General Scholarship Program's limited financial benefit to the private institutions is its low funding level. Of the $2 million given for scholarship aid by the Commonwealth for use in 1969-70, $1.2 million went to students attending Massachusetts private institutions. But that sum is equal to only 2 percent of the total student aid expenditures made by the institutions themselves the previous year.

The Massachusetts Board of Higher Education has recommended a significant expansion in the student aid program. The funding request for 1971-72 is $8 million—an increase of $6 million over 1969-70. While this assistance will certainly expand educational opportunity for the Commonwealth's residents, the potential direct benefit to the institutions is small when compared with the deficits the institutions could incur in the near future. We therefore conclude that, at anything like contemplated funding levels, this form of state aid will have limited effect in helping the private institutions cope with their future deficits.

POSSIBLE INTERNAL STEPS

In the absence of increased funds from external revenue sources of the types just discussed, the private institutions of higher education in Massachusetts will have to adjust internal policy and operations to contend with growing financial difficulties. As a first alternative, the institutions will probably intensify their efforts to improve utilization of existing institutional resources. As a second alternative, the institutions may be forced to take internal steps that have a high potential for solving financial problems but that also have serious and undesirable side effects. This section describes these two alternatives.

Better Management Of Resources

Prompted in part by recent studies suggesting better ways to manage resources,* many Massachusetts private institutions of higher education have tried to improve their financial

*For example, *Managing Education Endowments—Report to the Ford Foundation*, Advisory Committee on Endowment Management, Ford Foundation.

positions by getting more value from the resources they now have. Institutional administrators interviewed during the study described a number of efforts aimed at improving resource utilization; for example:

- Use of existing physical plant for night and summer school programs
- Rigorous control of administrative expenses
- Efficient management of endowment and cash.

An appraisal of resource utilization was not within the scope of this study. However, observations during this study and our work elsewhere in the field of education have convinced us that there is substantial opportunity for improvement in the areas listed above. In fact, our projected trends for general and administrative expenditures and for endowment appreciation already assume some improvement in management in that the selected growth rates are more optimistic than historical rates.

Moreover recent and planned improvements in the use of resources are reflected in all growth rates calculated from historical data and institutional projections. Because our growth rate selections were based on those two sets of growth rates, our projections already reflect whatever improvement has been effected in the past or is considered feasible in the future. Therefore, we are pessimistic about the chances for substantial improvement beyond the rate of progress implicit in our selected growth rates.

Policy Changes To Cope with Deficits

Since resource management appears to offer limited opportunities for improvement in financial position, the private institutions must find other ways to cope with financial problems. Otherwise, they would soon become insolvent and have to cease operations. We believe that before facing bankruptcy, the institutions would make internal policy changes to remedy their financial ills. Such internal changes could include:

- Raising tuition growth rates
- Cutting enrollment growth rate
- Limiting student aid growth to the rate of tuition growth
- Reducing plant expenditures
- Incurring increasing amounts of debt.

The actual steps that will be taken—or their impact on projected financial components—cannot be predicted easily; moreover, they may vary from one institution to another. To provide some index of the possible effects of these steps, we tested several hypothetical changes; the results are summarized in Table 15.

Table 15
Effect of Internal Steps
On Aggregate 1975-76 Deficit
(Millions of Dollars)

Step	Net Total Deficit	Change in Deficit	Deficit as Percentage of Total Expenditures	Change in Percentage Deficit
Assume study's financial results materialize as projected	$53.3	–	3.6%	–
Increase tuition growth by 1 percent	$33.1	$20.2	2.2%	1.4%
Cut back rate of enrollment growth by 25 percent	$38.7	$14.6	2.7%	0.9%
Hold student aid/tuition ratio to current level	$44.8	$ 8.5	3.0%	0.6%
Reduce plant expenditures by 10 percent	$45.9	$ 7.4	3.1%	0.5%
Accept debt level increase equal to 20 percent of plant expenditures	$34.2	$19.1	2.3%	1.3%

Increasing the tuition growth rate by 1 percent over the rates assumed in our projections would theoretically reduce the deficit by $20 million. Accepting debt level increases equal to 20 percent of plant expenditures—the average rate of debt accumulation for the Massachusetts private sector since 1962- would have practically the same effect. And cutting back the rate of enrollment growth would reduce projected deficits significantly.

Such steps could be extremely difficult for many institutions to implement, however. Even without the additional 1 percent increase used in the test, the projected growth rate in tuition is significantly higher than the current rate of growth in disposable income per capita. Still faster tuition growth would widen the gap between the private institutions' tuition charges and the charges of public institutions. Excessive tuition charges could place many institutions in real danger of pricing themselves out of their best student markets and could prevent some institutions from attaining planned enrollment levels.

The institutions may also find it difficult to raise debt levels even higher than current figures. Institutions that already have large debt obligations are not likely to obtain additional debt financing easily, particularly if the funds will apparently be used to offset operating deficits. Moreover, excessive use of debt as a source of funds may buy short-term

solvency at the expense of long-term financial health; debt merely postpones a shortage of funds.

The difficulties associated with the two examples just described illustrate the possible penalties institutions may pay in taking such steps. To assume that all the financial problems faced by private institutions can be avoided painlessly by putting all of these steps into effect would be highly unrealistic.

Without greater growth in revenue, however, many institutions will be forced to choose among these kinds of alternatives and to bear the consequences associated with the choices they make. But the penalties would not strike the institutions alone. Many of these choices would also have unfavorable consequences for the citizens of the Commonwealth of Massachusetts.

¶ **Educational opportunities available to Massachusetts residents would be constricted.** At least three of the five internal policy changes just discussed would constrict the educational opportunities available to citizens of Massachusetts.

- Limited enrollment growth would reduce the projected number of slots available for higher education, and the competition for these slots would grow more intense. Students with unexceptional ability or limited financial resources would then be at a greater disadvantage in securing advanced education than they are now.

- A rate of growth in tuition charges higher than that assumed in the projections would place private higher education beyond the reach of more middle and lower income families.

- Slowed growth in student aid—like faster increases in tuition—would also aggravate the financial problems of disadvantaged and middle income students in gaining higher education.

¶ **The public sector would be forced to expand even faster in the future to maintain the same educational opportunity in Massachusetts.** To the extent that private enrollments are limited by institutional policy or excessive tuition charges, the public sector will face greater pressures to provide even more spaces for Massachusetts students seeking higher education. The extreme case of the failure of an institution would compound the additional burden on the public sector through a quantum reduction in educational supply. To prevent actual cessation of operations, the state might choose to assume the alternative burden of operating the institution itself.*

The public costs of additional expansion of the educational system would be substantial. During the recent large rise in public higher education enrollments in Massachusetts, annual operating appropriations increased from $19 million in 1961 to $105 million in 1969; capital appropriations grew from $18 million in 1961 to $74 million in 1968. A recent study by the Massachusetts Board of Higher

*Severe financial problems at a number of universities have already prompted similar state action; for example, the University of Pittsburgh, the University of Buffalo, and the University of Houston.

Education* indicated that in the next 11 years, the number of students seeking higher education in the Commonwealth will grow so much faster than the planned supply of public and private enrollment slots that by 1980 there will be a shortage of 85,000 slots. Any reduction in the planned rate at which the private sector absorbs students will create additional pressure for the public sector to provide slots and to accelerate future increases in public appropriations.

¶ **Quality of education offered at the private institutions could suffer.** Decreasing the amount of physical resources available to students—the fourth measure tested in Table 15—would lower the quality of the student's education. Other steps that were not treated in Table 15 but that would be detrimental to educational quality include increasing student-to-faculty ratios and reducing available counseling services. While some of these measures might be taken in the name of efficiency, their effect would be to reduce the quality of education provided for future students.

It is apparent that many of the steps institutions might take to cope with financial problems would have serious consequences for the Commonwealth of Massachusetts and its residents. Left with no other choice, however, the private institutions will undoubtedly enact some of these measures. Because of the heavy dependence of Massachusetts higher education on the private sector, the ultimate result of such measures could be a severe shortage in the state's total resources for higher education—both in the number of student spaces available and in the level of quality. This threat to Massachusetts' prominent position in the field of higher education is already becoming a reality. It will become progressively greater each year unless additional financial support—from some new source—is made available to the state's private institutions of higher education.

***

After hearing our report on the financial problems faced by Massachusetts private higher education, the Select Committee wished to consider alternative means by which the Commonwealth might provide financial assistance. To aid the Select Committee in this task, we presented to the Committee the potential advantages and disadvantages of alternative forms of assistance. The recommendations that emerged from those discussions are incorporated in the Select Committee's report to the Governor, bound at the front of this volume.

*_Massachusetts Enrollment Study_, Massachusetts Board of Higher Education, January 1969.

STUDY METHODOLOGY

This appendix supplements the report on the financial problems of Massachusetts private higher education by providing additional detail on the study methodology. Specifically, it describes:

- ¶ Data submitted by the private institutions
- ¶ Institutional participation in the study
- ¶ Techniques used to develop financial projections.

INSTITUTIONAL DATA SUBMISSIONS

The first part of the study effort was devoted to obtaining accurate and up-to-date information about the private institutions from the institutions themselves. Such information was required to determine the current status of Massachusetts private higher education and to indicate its future financial position. In the sections that follow, we describe two elements of the data-gathering process: (1) kinds of information requested; and (2) steps taken to facilitate completion of the data-collection forms.

Kinds of Information

To obtain suitable information for meeting the study objectives, we asked the private institutions to submit two types of data:

1. Historical data covering past and current educational activities and financial operations
2. Projection data covering future educational and financial plans.

The specific data requested within these two broad categories pertained to the following subject areas:

1. **Enrollments.** Number of full-time, part-time, and full-time equivalent students enrolled in each of the following categories: undergraduate, first professional, graduate, postgraduate, and extension.

2. **Degrees Granted.** Number of degrees awarded in the following categories: doctor's, master's, first professional, bachelor's and associate.*

3. **Faculty.** Number of full-time, part-time, and full-time equivalent faculty members in each rank (e.g., professor, associate professor); total faculty compensation; and compensation per full-time equivalent faculty member.

*This category included occupational certificates.

4. **Current Operations.** Revenues and expenditures for educational and general purposes, research and sponsored programs, student aid, public service programs, and auxiliary enterprises.

5. **Capital Funds.** Plant receipts and expenditures, endowment, life income contracts and annuities, and indebtedness.

6. **General Statistics.** General historical information not necessarily required for projections (e.g., estimates of deferred maintenance, appraised real asset value, total student aid loans).

Historical data in the categories just described were collected for 1959-60, 1962-63, and each year from 1965-66 through 1968-69. Years emphasized in institutional projections were 1975-76 and 1980-81, the key years in the state Master Plan for Higher Education. The institutions were also requested to provide, if readily available as part of existing plans, projection data for each year through 1975-76.

Steps To Facilitate Completion of Forms

Several steps were taken to facilitate the considerable task of completing the data forms and to help ensure that the data submitted were as reliable and consistent as possible. First, the data forms were designed to match, where possible, the structure of the widely used Higher Education General Information Survey (HEGIS) forms of the U.S. Office of Education. Institutions that had previously participated in that survey were able to draw on past responses to complete historical data forms whenever both surveys used the same definitions.* Besides using HEGIS formats and terms, we utilized as much as possible the definitions provided in the standard text *College and University Business Administration,* the same source used for HEGIS definitions. This measure allowed institutions to make fullest use of data available on institutional books.

The procedures for making projections were designed to recognize the wide variation among institutions in planning experience. Institutions that had prepared long-range plans were able to transfer much of the requested information directly to our forms. For those institutions without long-range planning experience, we made available a number of optional work sheets to aid them in making projections.

INSTITUTIONAL PARTICIPATION

Institutional response to the study team's request for information was excellent. Of the 64 private institutions asked to participate, 56 schools submitted historical data. While eight submissions were subsequently found to be too incomplete for the analytical model used in the study, the remaining 48 submissions accounted for 91 percent of total enrollments in the private sector of Massachusetts higher education.

*Institutions had to exercise care in using older HEGIS information because the forms have undergone frequent change. In addition, the institutions were requested to submit a small amount of information that had not previously been requested by the U.S. Office of Education.

Forty-four institutions submitted projection data. Out of that total, 35 schools—accounting for 60 percent of total enrollment—submitted data sufficiently complete for analysis of trends. The partial submissions of two large institutions, while not directly usable in analyzing trends, provided important information that broadened the basis of our analyses beyond the set of usable submissions. Including those two institutions, the student population covered by institutional projections was 84 percent of the total.

As would be expected, institutions generally regarded the historical data they submitted as more accurate and reliable than their projections. Being based on fact, historical information was reasonably accurate except for normal human error or misinterpretation. Projections, on the other hand, were subject to a wider range of error for at least two reasons. First, many institutions had never before prepared long-term projections. Secondly, the numerous judgments required in developing projections make the results appear subjective and possibly biased.*

Despite a certain degree of imprecision, the institutional projections provided highly valuable information—principally on planned changes in enrollment, balance of graduate and undergraduate education, and student-to-faculty ratios. In addition, the projections revealed the institutions' opinions as to their probable financial positions in the future.

OVERVIEW OF
PROJECTION METHODOLOGY

Early in the study, the team had to decide how to process and analyze the great amount of data being collected. One decision was how to aggregate the data from different institutions; possible approaches were: (1) to study all private institutions in one group; (2) to divide the institutions into several groups; or (3) to treat each institution individually. We rejected the first alternative because conclusions based on completely aggregate results would not have recognized significant and important differences between the institutions in the study. The last alternative was not feasible because the overwhelming task of selecting 35 growth rates for each of the 48 institutions in the sample would have allowed too little time for carefully considering each growth rate decision that had to be made.

The basis for forming the six groups decided on was described in our letter of submittal. In Table 1, we summarize the definitions and dimensions of each group.

The team made projections of future financing requirements for each of the six groups. The projection process consisted of four major steps:

1. **Inflate 1968-68 data to account for missing institutions.** The schools submitting data for the study represented the majority of private colleges and universities in Massachusetts. However, it was still necessary to inflate the sample data to account for the institutions not submitting data so that conclusions about all the institutions in each group could be drawn. Because the institutions in a group had similar purposes and financial characteristics, we felt safe in assuming that on a per-student basis revenues, expenditures, and faculty size would be approximately the same for all institutions in a group. Therefore, to obtain data representing each

*One form of possible bias is a tendency to use financial projections that have been approved by trustees even when other results are known to be more likely to occur.

Table 1[1]

Institutional Groups Used in the Study

Group Number	Group Definition	Number of Institutions	Total Full-Time Equivalent Enrollment[2]	Total 1968-69 Current Expenditures (In Millions)
I	Two-year institutions	18	13,300	$ 29
II	Specialized Colleges	9	8,100	18
III	Colleges with Lower[3] Expenditures/FTES	19	22,000	42
IV	Colleges with Higher[3] Expenditures/FTES	10	16,800	85
V	All Universities Except Harvard and MIT	6	62,700	187
VI	Harvard and MIT	2	23,100	412
		64	146,000	$773

[1] Statistics presented in this table are for whole groups, not just the samples.

[2] These full-time equivalent enrollment figures include extension students.

[3] Groups III and IV were formed on the basis of educational and general expenditures per full-time equivalent student. (Expenditures for sponsored research and other sponsored programs are not included.)

group as a whole, we multiplied data elements for the sample submitting usable data by the ratio of FTEE of the entire group—including missing institutions* —to FTEE of the group sample. Because of the excellent response to the survey, this ratio never exceeded 1.44 (Table 2). For all groups combined, the ratio was 1.093.

*The study team was able to obtain at least a 1968-69 enrollment estimate for each institution.

Table 2

Ratio of Group FTEE to Sample FTEE
1968-1969

Group	Ratio of Total Group FTEE To Sample FTEE
I	1.377
II	1.241
III	1.440
IV	1.129
V	1.000
VI	1.000

2. **Calculate growth rates implicit in historical data and in institutional projections.** Using a computer, we calculated the historical trends in key variables between 1965-66 and 1968-69. Those years were selected for two reasons. First, because the institutions were able to supply better and more complete data for recent years, we had a more reliable sample for 1965-66 than for any earlier year. Secondly, we felt that the trends displayed by recent data would predict future trends better than trends displayed by older data.* Growth rates implicit in projections made by institutional administrators were then calculated between 1968-69 and 1975-76. This analysis provided growth rates—almost identical in definition to historical growth rates—that reflected the plans and expectations of the institutions.

3. **Select appropriate future growth rates.** The previous step provided historical growth rates and growth rates implicit in the institutional projections—two key sources of evidence on which to base our selection of future growth rates. For most variables, the rates selected by the study team fell within the range of the historical and projection growth rates, although external information occasionally suggested a rate outside that range. Illustrations of our reasoning in choosing growth rates were presented in Chapter 2 of the report.

4. **Develop the projections.** In the final step, the computer model applied the *growth rates* selected in the last step to the *base-year* key variable *levels* to obtain *projected levels* of key variables for 1975-76 and 1980-81. The computer then combined these key variable levels (e.g., tuition and fees per student and enrollment) to calculate the levels of revenue and expenditure components (e.g., revenue from tuition and fees).

To make its projections in terms of key variable growth rates, the study team had to establish in the computer model many relationships between the key variables and the

*For example, we expected inflation to continue at roughly the 4 percent annual rate averaged since 1965.

various revenue and expenditure components. Those relationships, which were critical determinants of the projected financial results, are discussed in the next section.

RELATIONSHIPS
BETWEEN VARIABLES

Chapter 2 of the report described the use of key variables in projecting future levels of revenue and expenditure components. Those components tend to change over time as the result of changes in two kinds of factors: (1) *level of activity* at the institution (e.g., enrollment); and (2) *revenue or cost per unit of activity* (e.g., tuition and fees per student). Such factors were the key variables used in the projection model. In this section, we indicate how each revenue or expenditure component was derived from its key variables by discussing:

- ¶ Structural activity levels
- ¶ Capital receipts and expenditures
- ¶ Operating revenues and expenditures
- ¶ Assumed patterns of growth.

Structural
Activity Levels

Two types of activity levels were used in the projection model. The first type, which we discuss here, was termed *structural* activity levels because they define the basic characteristics of an institution. They specify, for example, an institution's size, its emphasis on graduate versus undergraduate instruction, and the size of its faculty. The second type – *derived* activity levels–covers revenue or expenditure components that were generally *derived* from *structural* activity levels. We shall see later, for example, that the tuition and fees revenue component was used as an activity level that determined the projected level of student aid expenditures. Tuition and fee revenue, in turn, was derived from FTEE, a structural activity level. (See Figure 1.)

The important structural activity levels are FTEE, undergraduate FTEE, graduate FTEE, extension FTEE, weighted FTEE, on-campus resident students, faculty, and faculty compensation. The relationships between these variables are portrayed in Figure 2.

From the figure we see that the structural activity levels were related in the model in the following way:

1. **FTEE,** the structural activity level that ultimately influenced all other structural activity levels, was projected directly on the basis of an assumed growth rate and its level in 1968-69
2. **Undergraduate FTEE** was calculated as the product of FTEE and the ratio (projected directly) of undergraduate FTEE to total FTEE

FIGURE 1

STRUCTURAL AND DERIVED ACTIVITY LEVELS

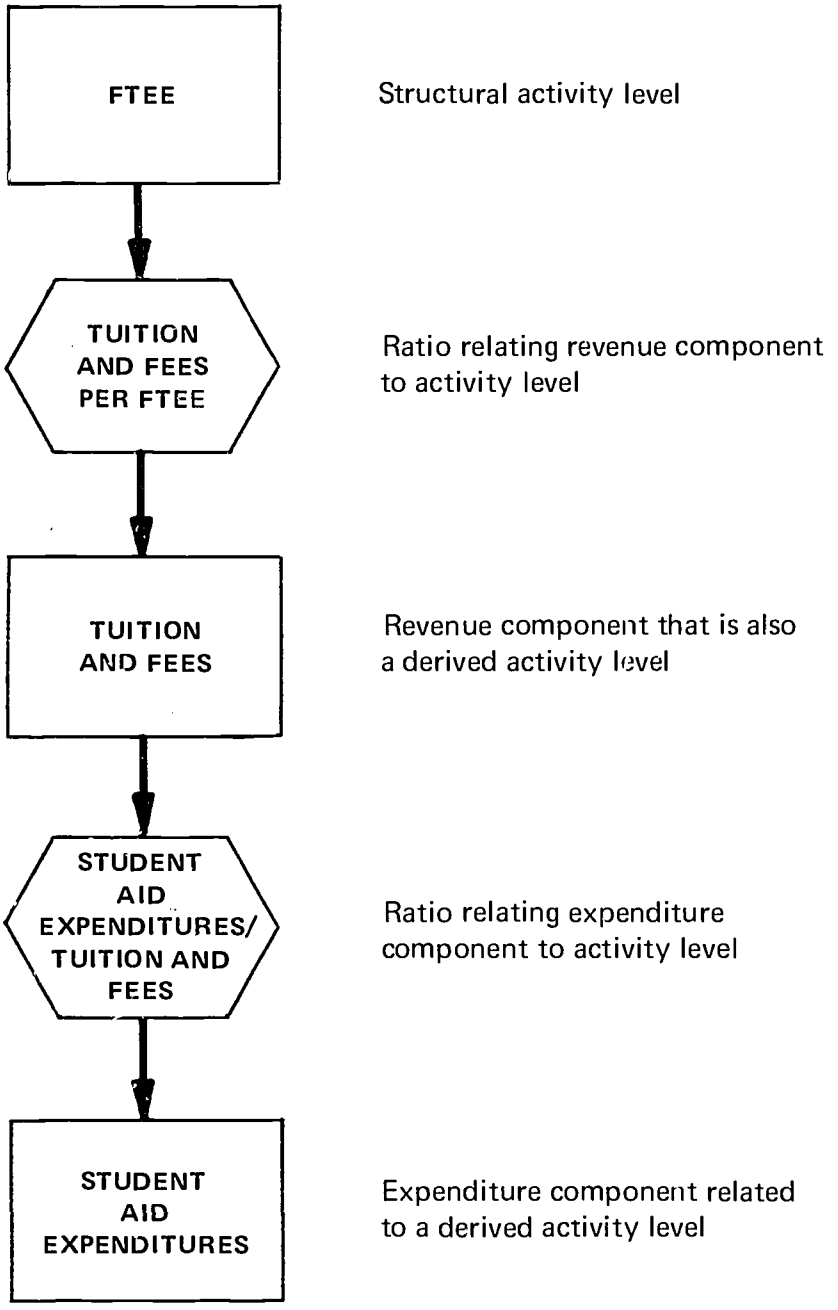
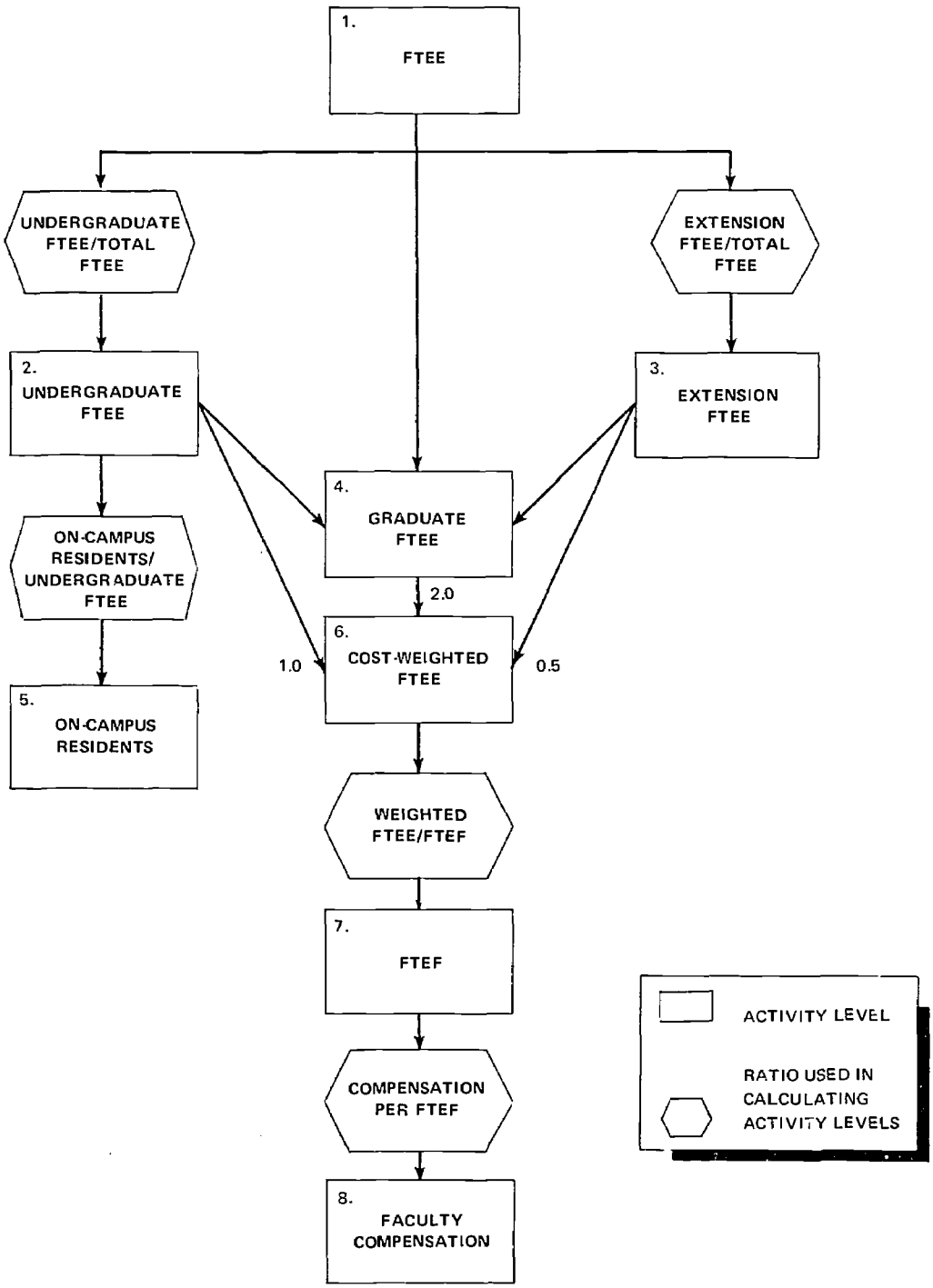


FIGURE 2

RELATIONSHIPS AMONG STRUCTURAL ACTIVITY LEVELS



3. **Extension FTEE** was calculated as the product of FTEE and the ratio (projected directly) of extension FTEE to total FTEE

4. **Graduate FTEE** was calculated by subtracting the sum of undergraduate and extension FTEE (Steps 2 and 3) from total FTEE

5. **On-campus residents** was calculated as the product of undergraduate FTEE and the ratio (projected directly) of on-campus residents to undergraduate FTEE

6. **Cost weighted FTEE** was calculated by multiplying undergraduate FTEE by 1.0, extension FTEE by 0.5, and graduate FTEE by 2.0,* and then adding the three products

7. **Full-time equivalent faculty (FTEF)** was calculated by dividing weighted FTEE by the ratio (projected directly) of weighted FTEE to FTEF

8. **Faculty compensation** was the product of FTEF (Step 7) and compensation per FTEF (projected directly).

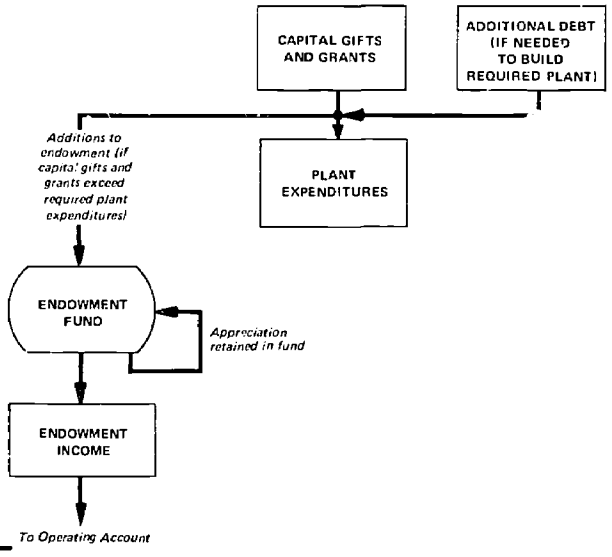
Most of the revenue and expenditure variables—whether operating or capital—were directly related to one of these activity levels. We discuss these relationships in the next two sections for capital and operating components respectively.

Capital Receipts
And Expenditures

Figure 3 shows the relationships among the capital variables.

FIGURE 3

RELATIONSHIPS AMONG CAPITAL VARIABLES



*These weights indicate the assumed relative annual costs of educating different types of students. The 0.5 weight for extension students is a judgmental estimate—based on discussions with institutional administrators—that educating extension students is only half as costly as educating undergraduates. The 2.0 weight for graduates is the approximate result of assuming a weight of 4.0 for Ph.D. candidates and 1.5 for master's and first professional candidates relative to undergraduates.

The following methods were used to project capital variables:

1. **Capital gifts and grants** were projected directly on the basis of the historical level and the assumed growth rate.

2. **Plant expenditures** were calculated as the product of weighted FTEE and the ratio (projected directly) of desired plant book value per weighted FTEE.* If capital gifts and grants were more than adequate to cover the desired level of plant expenditures, the model assumed that plant was built. If they were inadequate, capital receipts were supplemented with additions to existing debt obligations not exceeding the historic ratio of debt increases to plant expenditures.**

3. **Endowment market value at the end of a period** was calculated to be the sum of: (a) endowment market value at the beginning of the period; (b) accumulated endowment appreciation—an assumed percentage of endowment market value added to the principal in each year of the period; and (c) any excess of capital gifts and grants over plant expenditures during the period.

Operating Revenues
And Expenditures

Tables 4 and 5 show how the principal operating revenues and expenditures were calculated from activity levels and from revenues or expenditures per unit of activity.

The relationships shown in Tables 4 and 5 indicate that:

1. **Full-time equivalent enrollment affected, directly or indirectly, most operating revenue and expenditure variables.** The flow chart showing relationships between structural variables (Figure 2) clearly indicates that FTEE affected FTEF, number of on-campus residents, and cost-weighted FTEE. Thus, although FTEE governed relatively few revenue and expenditure components directly, many of these components were proportional to FTEE because of their direct dependence on other activity levels that were, in turn, proportional to FTEE.

2. **Full-time equivalent faculty determined three major revenue items.** Research, other educational and general, and major public service revenues were related to FTEF on the assumption that these revenues were principally "caused" by the presence of faculty members to conduct the implied activities. If FTEF changed, we would expect these revenues to change.

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*Plant book value increases are not really proportional to increases in "real" plant for two primary reasons: (a) inflation in building costs per unit of "real" plant; and (b) mounting land prices. The 1968-69 book values of institutional plants substantially understate their true replacement cost. For these reasons the analytical model adjusted trends in book value per weighted FTEE to approximate trends in "real" plant.

**Our assumption on the institutional use of debt allowed us to predict how much plant would *actually* be built—a figure that was needed to calculate plant maintenance expenditures. The availability of debt was ignored, however, in measuring the adequacy of funds for capital purposes. The net capital deficit was calculated as *desired* plant expenditures less capital gifts and grants.

Table 4
Calculation of Operating Revenue Components as Products of Activity Levels and Revenues per Unit of Activity

Operating Revenue Component	Activity Level	Revenue per Unit of Activity
Tuition and Fees	FTEE	Tuition and Fees/FTEE
Endowment Income[1]	Endowment Market Value	Endowment Income/ Endowment Market Value
Private Gifts and Grants	Not Applicable	Projected Directly
Research Revenue	FTEF	Research Revenue/FTEF
Other Educational and General Revenue	FTEF	Other Educational and General Revenue/FTEF
Student Aid Revenues[1]	Not Applicable	Projected Directly
Major Public Service Revenues	FTEF	Major Public Service Revenues/FTEF
Housing Revenues	Housing Expenditures	Housing Revenues/ Expenditures
Food Service Revenues	Food Service Expenditures	Food Service Revenues/ Expenditures
Other Auxiliary Enterprise Revenues	Other Auxiliary Enterprise Expenditures	Other Auxiliary Enterprise Revenues/Expenditures

[1] Endowment income restricted for student aid purposes was projected as part of total endowment income.

3. **Housing, food, and other auxiliary enterprise revenues were related to the corresponding expenditures.** We chose these relationships because the price charged for such services was closely related to the cost of the services.

4. **Housing and food service expenditures were related to the number of on-campus resident students.** Because resident students are the primary users of institutional housing, the number of on-campus resident students was an obvious choice as an activity level for calculating housing expenditures. For food items, we recognized that nonresidents also affect the expenditure level. But because residents tend to be the primary users of institutional dining facilities, we felt it was more appropriate to relate expenditures to residents than to total student population.

Table 5
Calculation of Operating Expenditures as
Products of Activity Levels and Expenditures per Unit of Activity

Operating Expenditure Component	Activity Level	Expenditure per Unit of Activity
Instruction and Departmental Research	Faculty Compensation	Instruction and Departmental Research/Faculty Compensation
Extension and Public Service	Faculty Compensation	Extension and Public Service/ Faculty Compensation
Library Expenditures	Weighted FTEE	Library Expenditures/Weighted FTEE
Plant Maintenance and Operation	Plant Book Value	Plant Maintenance and Operation/ Plant Book Value
General Administration, General Institutional Expense, and Student Services	Weighted FTEE	General Administration, General Institutional Expense, and Student Services/Weighted FTEE
Other Educational and General	FTEF	Other Educational and General/ FTEF
Research Expenditures	Research Revenue	Research Expenditures/ Revenue
Student Aid Grants	Tuition Revenue	Student Aid Grants/Tuition Revenue
Major Public Service Program Expenditures	Major Public Service Program Revenues	Major Public Service Program Expenditures/Revenues

5. **Research and major public service expenditures were related to research and major public service revenues.** We chose these relationships because the price of these activities is usually based on their cost.

6. **Tuition level determined student aid expenditures.** From the student's point of view, student aid can logically be interpreted as a tuition discount. An increase in tuition causes an increase in the total need for student aid. Therefore, we used tuition revenue as an activity level for student aid expenditures.

The relationships that we have discussed in this section were important determinants of the projection results. In all cases, the key variables used to obtain revenue and expenditure projections were themselves projected from 1968-69 levels by assuming that a certain growth would prevail in the future. We close our discussion of methodology by describing the growth patterns used in making key variable projections.

Assumed
Growth Patterns

The study team considered two alternative patterns of growth in projecting future levels of key variables:

- ¶ **Straight-line (linear) growth.** Under this pattern, the variable is expected to increase by a constant absolute amount each year. The growth rate in this case is usefully defined as the ratio of this constant to the 1968-69 value.

- ¶ **Compound growth.** Under this pattern, the variable is expected to increase each year by a constant percentage of its last value. The growth rate equals this constant percentage.

Because inflation—a compound process—was considered an important cause of growth in revenues and expenditures, the team decided to assume a compound growth process for all key variables of the following two forms:

- ¶ Revenue or cost per unit of activity when the activity level was structural. Examples of these variables include compensation per FTEF, tuition and fees per FTEE, and food service expenditures per on-campus resident.

- ¶ Revenue variables that were projected directly. Examples include private gifts and grants for current and capital purposes and government student aid grants.

For all other variables, we assumed growth would take place according to a straight-line process. Those variables included: (1) FTEE and the ratio variables used to calculate other structural activity levels (e.g., ratio of undergraduate to total FTEE; student-to-faculty ratio); and (2) ratios relating one dollar component to another dollar component or activity level (e.g., housing revenues/ housing operating expenditures; research expenditures/research revenues; instruction and departmental research/faculty compensation).

* * *

The specific assumptions and techniques we used in projecting the future financial position of Massachusetts private higher education significantly influenced the results obtained. But it would be impractical in a report of this scope to cover every assumption and every fine point of technique; hence, we have not attempted to give an exhaustive explanation of how the study was carried out. Rather, in this appendix and in Chapter 2, we have focused on the most important assumptions and procedures—that is, those factors that made the greatest difference in the projection results. We believe that the explanations we have provided will give the reader a sufficient understanding of the study methodology to permit him to interpret critically the findings and conclusions documented in this report.

BREAKDOWN OF PROJECTION RESULTS

Chapter 2 of the report presented a summary of the projected financial position of Massachusetts private higher education; this appendix provides the individual projections of major revenue and expenditure components on which that summary was based. Seven sets of tables are given—one for each of the six groups of institutions in the study and one for the private institutions in aggregate. The tables included in each set are:

1. Enrollment and faculty
2. Operating revenues
3. Operating expenditures
4. Capital receipts and expenditures
5. Summary of net total funds.

In each table, values are given for the projection years 1972-73, 1975-76, and 1980-81.

GROUP I

ENROLLMENT AND FACULTY

	1972-73	1975-76	1980-81
FTEE	14321	15117	16443
Weighted FTEE	14083	14861	16158
Student/Faculty Ratio	15.8	15.6	15.2
Full-Time Equivalent Faculty	889	952	1060

GROUP I

OPERATING REVENUES[1]
(Millions of Dollars)

	1972-73	1975-76	1980-81
EDUCATIONAL AND GENERAL REVENUE			
Tuition and Fees	21.8	26.6	37.0
Endowment Income	0.9	1.1	1.4
Private Gifts and Grants	0.7	0.9	1.3
Research and Sponsored Programs	1.4	1.5	1.7
Other Educational and General	0.9	1.2	1.9
Total	25.8	31.4	43.2
STUDENT AID REVENUE			
Total	0.6	0.8	1.1

Operating Revenues (continued)

	1972-73	1975-76	1980-81
MAJOR PUBLIC SERVICE PROGRAM REVENUE			
Total	0	0	0
AUXILIARY ENTERPRISE REVENUE			
Housing	5.1	6.0	7.7
Food Service	4.6	5.4	6.9
Other Auxiliary Enterprises	2.2	2.7	3.5
Total	11.9	14.1	18.1
TOTAL OPERATING REVENUES	38.4	46.2	62.4

[1] Because of rounding, figures recorded as totals may not equal the sum of components.

GROUP I

OPERATING EXPENDITURES[1]
(Millions of Dollars)

	1972-73	1975-76	1980-81
EDUCATIONAL AND GENERAL EXPENDITURES			
Instruction and Departmental Research	11.4	14.4	21.1
Extension and Public Service	0.3	0.3	0.5
Libraries	0.8	1.0	1.7
Plant Maintenance and Operation	4.4	5.1	6.2
General Administration And Student Services	10.0	12.6	18.3
Research and Sponsored Programs	1.2	1.2	1.4

Operating Expenditures (continued)

	1972-73	1975-76	1980-81
Other Educational and General	0.5	0.6	0.7
Total	28.5	35.2	49.9
STUDENT AID GRANTS			
Total	0.9	1.1	1.6
MAJOR PUBLIC SERVICE PROGRAM EXPENDITURES			
Total	0	0	0
AUXILIARY ENTERPRISE EXPENDITURES			
Housing	3.9	4.8	6.9
Food Service	3.4	4.2	6.1
Other Auxiliary Enterprises	1.7	2.1	2.7
Total	9.0	11.1	15.7
TOTAL OPERATING EXPENDITURES	38.4	47.5	67.3
NET OPERATING FUNDS	0	−1.3	−4.9

[1] Because of rounding, figures recorded as totals may not equal the sum of components.

GROUP I

CAPITAL RECEIPTS AND EXPENDITURES[1]
(Millions of Dollars)

	1972-73	1975-76	1980-81
CAPITAL RECEIPTS			
Capital Gifts and Grants	5.8	7.1	9.3
Endowment Appreciation	1.3	1.5	1.8
TOTAL[2]	7.1	8.6	11.1

Capital Receipts and Expenditures (continued)

	1972-73	1975-76	1980-81
CAPITAL EXPENDITURES			
Plant Expenditures[3]	5.8	7.1	9.3
Endowment Appreciation Retained in Endowment	1.3	1.5	1.8
Other Additions to Endowment	0.1	0.1	0.1
TOTAL	7.1	8.6	11.1
NET CAPITAL FUNDS	0	0	0

[1] Because of rounding, figures recorded as totals may not equal the sum of components.

[2] Excluding net current funds and debt.

[3] This component measures desired plant expenditures so that the overall shortage of capital receipts to cover projected capital expenditure requirements can be determined.

GROUP I

SUMMARY OF NET TOTAL FUNDS
(Millions of Dollars)

	1972-73	1975-76	1980-81
NET OPERATING FUNDS	0	−1.3	−4.9
NET CAPITAL FUNDS	0	0	0
NET TOTAL FUNDS	0	−1.3	−4.9

GROUP II

ENROLLMENT AND FACULTY

	1972-73	1975-76	1980-81
FTEE	9203	10023	11390
Weighted FTEE	10372	11462	13341
Student/Faculty Ratio	23.2	22.5	21.2
Full-Time Equivalent Faculty	447	510	628

GROUP II

OPERATING REVENUES[1]
(Millions of Dollars)

	1972-73	1975-76	1980-81
EDUCATIONAL AND GENERAL REVENUE			
Tuition and Fees	17.1	22.1	33.7
Endowment Income	0.5	0.6	0.7
Private Gifts and Grants	1.2	1.5	2.2
Research and Sponsored Programs	0.2	0.3	0.3
Other Educational and General	0.7	1.0	1.8
Total	19.7	25.5	38.7
STUDENT AID REVENUE			
Total	0.7	0.8	1.2
MAJOR PUBLIC SERVICE PROGRAM REVENUE			
Total	0	0	0

Operating Revenues (continued)

AUXILIARY ENTERPRISE REVENUE			
Housing	2.0	2.5	3.3
Food Service	2.8	3.4	4.9
Other Auxiliary Enterprises	1.2	1.5	2.0
Total	6.0	7.4	10.3
TOTAL OPERATING REVENUES	26.3	33.7	50.2

[1] Because of rounding, figures recorded as totals may not equal the sum of components.

GROUP II

OPERATING EXPENDITURES[1]
(Millions of Dollars)

	1972-73	1975-76	1980-81
EDUCATIONAL AND GENERAL EXPENDITURES			
Instruction and Departmental Research	9.6	13.0	21.4
Extension and Public Service	0	0	0
Libraries	0.8	1.1	1.9
Plant Maintenance and Operation	2.2	2.5	3.2
General Administration And Student Services	5.5	7.2	11.2
Research and Sponsored Programs	0.2	0.2	0.3
Other Educational and General	0.7	0.9	1.3

Operating Expenditures (continued)

	1972-73	1975-76	1980-81
Total	18.9	24.9	39.2
STUDENT AID GRANTS			
Total	1.4	1.8	2.8
MAJOR PUBLIC SERVICE PROGRAM EXPENDITURES			
Total	0	0	0
AUXILIARY ENTERPRISE EXPENDITURES			
Housing	1.7	2.1	3.1
Food Service	2.7	3.4	4.8
Other Auxiliary Enterprises	1.2	1.5	2.0
Total	5.6	7.0	9.9
TOTAL OPERATING EXPENDITURES	25.9	33.8	51.9
NET OPERATING FUNDS	0.4	−0.1	−1.7

[1] Because of rounding, figures recorded as totals may not equal the sum of components.

GROUP II

CAPITAL RECEIPTS AND EXPENDITURES[1]
(Millions of Dollars)

	1972-73	1975-76	1980-81
CAPITAL RECEIPTS			
Capital Gifts and Grants	1.7	2.1	2.6
Endowment Appreciation	0.6	0.7	0.9
TOTAL[2]	2.3	2.8	3.5
CAPITAL EXPENDITURES			
Plant Expenditures[3]	5.4	6.9	9.6

Capital Receipts and Expenditures (continued)

	1972-73	1975-76	1980-81
Endowment Appreciation Retained in Endowment	0.6	0.7	0.9
Other Additions to Endowment	0	0	0
TOTAL	6.0	7.7	10.5
NET CAPITAL FUNDS	−3.7	−4.9	−6.9

[1] Because of rounding, figures recorded as totals may not equal the sum of components.
[2] Excluding net current funds and debt.
[3] This component measures desired plant expenditures so that the overall shortage of capital receipts to cover projected capital expenditure requirements can be determined.

GROUP II

SUMMARY OF NET TOTAL FUNDS
(Millions of Dollars)

	1972-73	1975-76	1980-81
NET OPERATING FUNDS	0.4	−0.1	−1.7
NET CAPITAL FUNDS	−3.7	−4.9	−6.9
NET TOTAL FUNDS	−3.3	−5.0	−8.7

GROUP III

ENROLLMENT AND FACULTY

	1972-73	1975-76	1980-81
FTEE	24879	27006	30551
Weighted FTEE	28209	30898	35476
Student/Faculty Ratio	18.8	18.8	18.8
Full-Time Equivalent Faculty	1504	1647	1891

GROUP III

OPERATING REVENUES[1]
(Millions of Dollars)

	1972-73	1975-76	1980-81
EDUCATIONAL AND GENERAL REVENUE			
Tuition and Fees	40.2	51.6	77.0
Endowment Income	0.4	0.5	0.6
Private Gifts and Grants	4.8	6.0	8.6
Research and Sponsored Programs	1.9	2.3	3.2
Other Educational and General	1.5	1.9	2.6
Total	48.9	62.3	92.1
STUDENT AID REVENUE			
Total	1.7	2.2	3.3

[1] Because of rounding, figures recorded as totals may not equal the sum of components.

Operating Revenues (continued)

	1972-73	1975-76	1980-81
MAJOR PUBLIC SERVICE PROGRAM REVENUE			
Total	0	0	0
AUXILIARY ENTERPRISE REVENUE			
Housing	5.1	6.2	8.5
Food Service	6.5	8.1	11.6
Other Auxiliary Enterprises	3.1	3.8	5.2
Total	14.6	18.1	25.3
TOTAL OPERATING REVENUES	65.2	82.5	120.7

GROUP III

OPERATING EXPENDITURES[1]
(Millions of Dollars)

	1972-73	1975-76	1980-81
EDUCATIONAL AND GENERAL EXPENDITURES			
Instruction and Departmental Research	19.2	25.3	39.5
Extension and Public Service	0	0	0
Libraries	2.8	3.9	6.5
Plant Maintenance and Operation	4.8	5.3	6.3
General Administration And Student Services	13.3	17.4	26.7
Research and Sponsored Programs	1.2	1.5	2.1

Operating Expenditures (continued)

	1972-73	1975-76	1980-81
Other Educational and General	0.8	1.0	1.7
Total	42.1	54.4	82.8
STUDENT AID GRANTS			
Total	3.7	4.6	6.6
MAJOR PUBLIC SERVICE PROGRAM EXPENDITURES			
Total	0	0	0
AUXILIARY ENTERPRISE EXPENDITURES			
Housing	4.0	5.1	7.5
Food Service	5.9	7.6	11.1
Other Auxiliary Enterprises	3.0	3.6	5.0
Total	12.9	16.3	23.6
TOTAL OPERATING EXPENDITURES	58.7	75.3	113.1
NET OPERATING FUNDS	6.5	7.2	7.6

[1] Because of rounding, figures recorded as totals may not equal the sum of components.

GROUP III

CAPITAL RECEIPTS AND EXPENDITURES[1]
(Millions of Dollars)

	1972-73	1975-76	1980-81
CAPITAL RECEIPTS			
Capital Gifts and Grants	3.8	4.7	6.0
Endowment Appreciation	0.4	0.4	0.5
TOTAL[2]	4.2	5.1	6.5

Capital Receipts and Expenditures (continued)

	1972-73	1975-76	1980-81
CAPITAL EXPENDITURES			
Plant Expenditures[3]	8.9	11.0	14.6
Endowment Appreciation Retained in Endowment	0.4	0.4	0.5
Other Additions to Endowment	0	0	0
TOTAL[2]	9.3	11.5	15.2
NET CAPITAL FUNDS	−5.1	−6.4	−8.7

[1] Because of rounding, figures recorded as totals may not equal the sum of components.
[2] Excluding net current funds and debt.
[3] This component measures desired plant expenditures so that the overall shortage of capital receipts to cover projected capital expenditure requirements can be determined.

GROUP III

SUMMARY OF NET TOTAL FUNDS
(Millions of Dollars)

	1972-73	1975-76	1980-81
NET OPERATING FUNDS	6.5	7.2	7.6
NET CAPITAL FUNDS	−5.1	−6.4	−8.6
NET TOTAL FUNDS	1.4	0.8	−1.0

GROUP IV

ENROLLMENT AND FACULTY

	1972-73	1975-76	1980-81
FTEE	18183	19209	20920
Weighted FTEE	19257	20400	22320
Student/Faculty Ratio	11.8	12.2	12.7
Full-Time Equivalent Faculty	1628	1677	1753

GROUP IV

OPERATING REVENUES[1]
(Millions of Dollars)

	1972-73	1975-76	1980-81
EDUCATIONAL AND GENERAL REVENUE			
Tuition and Fees	44.8	56.9	84.5
Endowment Income	14.5	16.6	20.6
Private Gifts and Grants	8.0	9.9	14.2
Research and Sponsored Programs	5.6	6.5	8.2
Other Educational and General	4.6	5.8	8.5
Total	77.4	95.7	136.1
STUDENT AID REVENUE			
Total	5.7	6.7	9.0
MAJOR PUBLIC SERVICE PROGRAM REVENUE			
Total	0	0	0

Operating Revenues (continued)

	1972-73	1975-76	1980-81
AUXILIARY ENTERPRISE REVENUE			
Housing	9.7	11.4	14.8
Food Service	12.0	14.1	18.3
Other Auxiliary Enterprises	3.3	4.1	5.7
Total	25.0	29.5	38.7
TOTAL OPERATING REVENUES	108.1	131.9	183.7

[1] Because of rounding, figures recorded as totals may not equal the sum of components.

GROUP IV

OPERATING EXPENDITURES[1]
(Millions of Dollars)

	1972-73	1975-76	1980-81
EDUCATIONAL AND GENERAL EXPENDITURES			
Instruction and Departmental Research	34.9	43.5	62.4
Extension and Public Service	0.4	0.5	0.7
Libraries	3.9	5.1	7.6
Plant Maintenance and Operation	12.6	15.6	21.8
General Administration And Student Services	20.8	26.0	37.6
Research and Sponsored Programs	5.5	6.4	8.1
Other Educational and General	2.3	3.1	4.9

Operating Expenditures (continued)

	1972-73	1975-76	1980-81
Total	80.4	100.2	143.1
STUDENT AID GRANTS			
Total	8.2	10.7	16.3
MAJOR PUBLIC SERVICE PROGRAM EXPENDITURES			
Total	0	0	0
AUXILIARY ENTERPRISE EXPENDITURES			
Housing	9.0	10.7	14.1
Food Service	11.4	13.5	17.8
Other Auxiliary Enterprises	4.2	5.0	6.7
Total	24.7	29.3	38.6
TOTAL OPERATING EXPENDITURES	113.4	140.1	198.0
NET OPERATING FUNDS	−5.3	−8.2	−14.3

[1]Because of rounding, figures recorded as totals may not equal the sum of components.

GROUP IV

CAPITAL RECEIPTS AND EXPENDITURES[1]
(Millions of Dollars)

	1972-73	1975-76	1980-81
CAPITAL RECEIPTS			
Capital Gifts and Grants	15.8	19.4	25.2
Endowment Appreciation	22.7	26.0	31.6
TOTAL[2]	38.5	45.4	56.8
CAPITAL EXPENDITURES			
Plant Expenditures[3]	19.2	23.6	30.8

Capital Receipts and Expenditures
(continued)

	1972-73	1975-76	1980-81
Endowment Appreciation Retained in Endowment	22.7	26.0	31.6
Other Additions to Endowment	0	0	0
TOTAL	41.9	49.6	62.4
NET CAPITAL FUNDS	−3.4	−4.2	−5.6

[1] Because of rounding, figures recorded as totals may not equal the sum of components.
[2] Excluding net current funds and debt.
[3] This component measures desired plant expenditures so that the overall shortage of capital receipts to cover projected capital expenditure requirements can be determined.

GROUP IV

SUMMARY OF NET TOTAL FUNDS
(Millions of Dollars

	1972-73	1975-76	1980-81
NET OPERATING FUNDS	−5.3	−8.2	−14.3
NET CAPITAL FUNDS	−3.4	−4.2	−5.6
NET TOTAL FUNDS	−8.7	−12.4	−19.9

GROUP V

ENROLLMENT AND FACULTY

	1972-73	1975-76	1980-81
FTEE	67948	71897	78479
Weighted FTEE	81575	87182	96739
Student/Faculty Ratio	19.4	18.8	17.8
Full-Time Equivalent Faculty	4206	4640	5441

GROUP V

OPERATING REVENUES[1]
(Millions of Dollars)

	1972-73	1975-76	1980-81
EDUCATIONAL AND GENERAL REVENUE			
Tuition and Fees	129.9	163.8	239.2
Endowment Income	4.7	5.6	7.6
Private Gifts and Grants	17.9	22.6	33.2
Research and Sponsored Programs	45.4	56.4	80.5
Other Educational and General	7.3	9.7	15.5
Total	205.4	258.1	376.1
STUDENT AID REVENUE			
Total	13.5	17.2	26.1
MAJOR PUBLIC SERVICE PROGRAM REVENUE			
Total	2.7	3.2	4.2

Operating Revenues (continued)

	1972-73	1975-76	1980-81
AUXILIARY ENTERPRISE REVENUE			
Housing	11.8	14.6	20.5
Food Service	13.4	16.2	21.9
Other Auxiliary Enterprises	10.2	12.1	16.1
Total	35.4	42.9	58.5
TOTAL OPERATING REVENUES	257.0	321.5	464.8

[1]Because of rounding, figures recorded as totals may not equal the sum of components.

GROUP V

OPERATING EXPENDITURES[1]
(Millions of Dollars)

	1972-73	1975-76	1980-81
EDUCATIONAL AND GENERAL EXPENDITURES			
Instruction and Departmental Research	93.9	127.6	211.2
Extension and Public Service	1.4	1.5	1.5
Libraries	8.3	10.9	17.0
Plant Maintenance and Operation	16.7	20.6	28.4
General Administration And Student Services	38.2	50.1	77.9
Research and Sponsored Programs	41.5	51.5	73.5
Other Educational and General	3.5	4.4	6.2
Total	203.7	266.6	415.7

Operating Expenditures (continued)

	1972-73	1975-76	1980-81
STUDENT AID GRANTS			
Total	24.0	31.1	47.5
MAJOR PUBLIC SERVICE PROGRAM EXPENDITURES			
Total	2.4	2.8	3.7
AUXILIARY ENTERPRISE EXPENDITURES			
Housing	12.0	14.7	20.4
Food Service	12.4	15.3	21.2
Other Auxiliary Enterprises	10.6	12.7	16.8
Total	35.0	42.6	58.4
TOTAL OPERATING EXPENDITURES	265.1	343.1	525.2
NET OPERATING FUNDS	−8.1	−21.6	−60.4

[1] Because of rounding, figures recorded as totals may not equal the sum of components.

GROUP V

CAPITAL RECEIPTS AND EXPENDITURES[1]
(Millions of Dollars)

	1972-73	1975-76	1980-81
CAPITAL RECEIPTS			
Capital Gifts and Grants	22.3	27.2	35.5
Endowment Appreciation	7.1	8.6	11.5
TOTAL[2]	29.4	35.8	47.0
CAPITAL EXPENDITURES			
Plant Expenditures[3]	17.6	21.4	27.7
Endowment Appreciation Retained in Endowment	7.1	8.6	11.5

Capital Receipts and Expenditures
(continued)

	1972-73	1975-76	1980-81
Other Additions to Endowment	4.7	5.8	7.8
TOTAL	29.4	35.8	47.0
NET CAPITAL FUNDS	0	0	0

[1]Because of rounding, figures recorded as totals may not equal the sum of components.
[2]Excluding net current funds and debt.
[3]This component measures desired plant expenditures so that the overall shortage of capital receipts to cover projected capital expenditure requirements can be determined.

GROUP V

SUMMARY OF NET TOTAL FUNDS
(Millions of Dollars)

	1972-73	1975-76	1980-81
NET OPERATING FUNDS	−8.1	−21.6	−60.4
NET CAPITAL FUNDS	0	0	0
NET TOTAL FUNDS	−8.1	−21.6	−60.4

GROUP VI

ENROLLMENT AND FACULTY

	1972-73	1975-76	1980-81
FTEE	23535	23867	24422
Weighted FTEE	35444	36043	37048
Student/Faculty Ratio	15.3	15.2	15.0
Full-Time Equivalent Faculty	2318	2376	2475

GROUP VI

OPERATING REVENUES[1]
(Millions of Dollars)

	1972-73	1975-76	1980-81
EDUCATIONAL AND GENERAL REVENUE			
Tuition and Fees	60.5	75.2	107.9
Endowment Income	38.0	42.9	52.4
Private Gifts and Grants	45.2	56.2	80.6
Research and Sponsored Programs	225.6	260.1	329.7
Other Educational and General	9.0	10.7	14.3
Total	378.3	445.0	584.9
STUDENT AID REVENUE			
Total	32.7	40.0	56.1
MAJOR PUBLIC SERVICE PROGRAM REVENUE			
Total	75.8	83.4	97.6

Operating Revenues (continued)

	1972-73	1975-76	1980-81
AUXILIARY ENTERPRISE REVENUE			
Housing	7.9	9.2	11.9
Food Service	8.8	10.2	13.1
Other Auxiliary Enterprises	15.8	17.8	21.7
Total	32.5	37.3	46.7
TOTAL OPERATING REVENUES	519.3	605.7	785.4

[1] Because of rounding, figures recorded as totals may not equal the sum of components.

GROUP VI

OPERATING EXPENDITURES[1]
(Millions of Dollars)

	1972-73	1975-76	1980-81
EDUCATIONAL AND GENERAL EXPENDITURES			
Instruction and Departmental Research	85.6	103.9	143.6
Extension and Public Service	0.2	0.3	0.4
Libraries	18.1	25.3	44.1
Plant Maintenance and Operation	24.1	28.5	37.0
General Administration And Student Services	25.8	33.8	53.0
Research and Sponsored Programs	210.3	242.5	307.4
Other Educational and General	11.0	14.4	22.5

Operating Expenditures (continued)

	1972-73	1975-76	1980-81
Total	375.2	448.7	608.0
STUDENT AID GRANTS			
Total	37.3	48.9	76.4
MAJOR PUBLIC SERVICE PROGRAM EXPENDITURES			
Total	71.8	78.9	92.4
AUXILIARY ENTERPRISE EXPENDITURES			
Housing	8.3	9.5	11.8
Food Service	8.6	9.9	12.3
Other Auxiliary Enterprises	14.8	16.9	21.0
Total	31.8	36.3	45.2
TOTAL OPERATING EXPENDITURES	516.0	612.8	821.9
NET OPERATING FUNDS	3.3	–7.1	–36.5

[1] Because of rounding, figures recorded as totals may not equal the sum of components.

GROUP VI

CAPITAL RECEIPTS AND EXPENDITURES[1]
(Millions of Dollars)

	1972-73	1975-76	1980-81
CAPITAL RECEIPTS			
Capital Gifts and Grants	15.9	19.5	25.3
Endowment Appreciation	70.5	81.0	98.3
TOTAL [2]	86.4	100.5	123.6
CAPITAL EXPENDITURES			
Plant Expenditures[3]	22.4	26.1	32.3

Capital Receipts and Expenditures (continued)

	1972-73	1975-76	1980-81
Endowment Appreciation Retained in Endowment	70.5	81.0	98.3
Other Additions to Endowment	0	0	0
TOTAL	92.9	107.2	130.6
NET CAPITAL FUNDS	−6.5	−6.7	−7.0

[1] Because of rounding, figures recorded as totals may not equal the sum of components.

[2] Excluding net current funds and debt.

[3] This component measures desired plant expenditures so that the overall shortage of capital receipts to cover projected capital expenditure requirements can be determined.

GROUP VI

SUMMARY OF NET TOTAL FUNDS
(Millions of Dollars)

	1972-73	1975-76	1980-81
NET OPERATING FUNDS	3.3	−7.1	−36.5
NET CAPITAL FUNDS	−6.5	−6.7	−7.0
NET TOTAL FUNDS	−3.2	−13.8	−43.5

AGGREGATE

ENROLLMENT AND FACULTY

	1972-73	1975-76	1980-81
FTEE	158069	167119	182205
Weighted FTEE	188940	200846	221082
Student/Faculty Ratio	17.2	17.0	16.7
Full-Time Equivalent Faculty	10992	11802	13248

AGGREGATE

OPERATING REVENUES[1]
(Millions of Dollars)

	1972-73	1975-76	1980-81
EDUCATIONAL AND GENERAL REVENUE			
Tuition and Fees	314.3	396.2	579.3
Endowment Income	59.0	67.3	83.3
Private Gifts and Grants	77.8	97.1	140.1
Research and Sponsored Programs	280.1	327.1	423.6
Other Educational and General	24.0	30.3	44.6
Total	755.5	918.0	1271.1
STUDENT AID REVENUE Total	54.9	67.7	96.8
MAJOR PUBLIC SERVICE PROGRAM REVENUE Total	78.5	86.6	101.8

Operating Expenditures (continued)

	1972-73	1975-76	1980-81
AUXILIARY ENTERPRISE REVENUE			
Housing	41.6	49.9	66.7
Food Service	48.1	57.4	76.7
Other Auxiliary Enterprises	35.8	42.0	54.2
Total	125.4	149.3	197.6
TOTAL OPERATING REVENUES	1014.3	1221.5	1667.2

[1] Because of rounding, figures recorded as totals may not equal the sum of components.

AGGREGATE

OPERATING EXPENDITURES[1]
(Millions of Dollars)

	1972-73	1975-76	1980-81
EDUCATIONAL AND GENERAL EXPENDITURES			
Instruction and Departmental Research	254.6	327.7	499.2
Extension and Public Service	2.3	2.6	3.1
Libraries	34.7	47.3	78.8
Plant Maintenance and Operation	64.8	77.6	102.9
General Administration And Student Services	113.6	147.1	224.7
Research and Sponsored Programs	259.9	303.3	392.8
Other Educational and General	18.8	24.9	37.3

Operating Revenues (continued)

	1972-73	1975-76	1980-81
Total	748.8	930.0	1338.7
STUDENT AID GRANTS			
Total	75.5	98.2	151.2
MAJOR PUBLIC SERVICE PROGRAM EXPENDITURES			
Total	74.2	81.7	96.1
AUXILIARY ENTERPRISE EXPENDITURES			
Housing	38.9	46.9	63.8
Food Service	44.4	53.9	73.3
Other Auxiliary Enterprises	35.5	41.8	54.2
Total	119.0	142.6	191.4
TOTAL OPERATING EXPENDITURES	1017.5	1252.6	1777.4
NET OPERATING FUNDS	−3.2	−31.1	−110.2

[1] Because of rounding, figures recorded as totals may not equal the sum of components.

AGGREGATE

CAPITAL RECEIPTS AND EXPENDITURES[1]
(Millions of Dollars)

	1972-73	1975-76	1980-81
CAPITAL RECEIPTS			
Capital Gifts and Grants	65.3	80.0	103.9
Endowment Appreciation	102.6	118.2	144.6
TOTAL[2]	167.9	198.2	248.5
CAPITAL EXPENDITURES			
Plant Expenditures[3]	79.3	96.1	124.3

Capital Receipts and Expenditures (continued)

	1972-73	1975-76	1980-81
Endowment Appreciation Retained in Endowment	102.6	118.2	144.6
Other Additions to Endowment	4.8	5.9	7.9
TOTAL	186.6	220.4	276.8
NET CAPITAL FUNDS	−18.7	−22.2	−28.1

[1] Because of rounding, figures recorded as totals may not equal the sum of components.

[2] Excluding net current funds and debt.

[3] This component measures desired plant expenditures so that the overall shortage of capital receipts to cover projected capital expenditure requirements can be determined.

AGGREGATE

SUMMARY OF NET TOTAL FUNDS
(Millions of Dollars)

	1972-73	1975-76	1980-81
NET OPERATING FUNDS	−3.2	−31.1	−110.2
NET CAPITAL FUNDS	−18.7	−22.2	−28.1
NET TOTAL FUNDS	−21.9	−53.3	−138.4