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ABSTRACT

This document discusses the use of a formula approach to the preparation and recommendation of state government appropriations in support of public higher education activities. Emphasis is placed on general objectives, expenditures by programs, income, primary programs, support programs, and student financial assistance. (MJM)

John D. Millett

The Budget Formula As the Basis for State Appropriations in Support of Higher Education

Prepared for
COMMISSION FOR HIGHER EDUCATION
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Preface

During 1973 and 1974 the Academy for Educational Development has been engaged in a study of state government practices in the support of higher education on behalf of the Indiana Commission for Higher Education. This study was made possible by a grant from the Lilly Endowment of Indianapolis to the Commission. Andrew H. Lupton directed the study and John D. Millett, vice president of the Academy and director of the Academy's Management Division, provided general supervision.

The study has had further valuable assistance from a panel of advisers made up of Dr. Earl F. Cheit of the Carnegie Council for Policy Studies in Higher Education; Dr. David D. Henry, President Emeritus of the University of Illinois; Dr. Wilbur K. Pierpont, Vice President and Chief Financial Officer of the University of Michigan; and Dr. Cameron P. West, former executive director of the Illinois Board of Higher Education.

In connection with this study and upon the basis of his own experience as chancellor of a state board of higher education, Dr. Millett prepared a paper on the use of a formula approach to the preparation and recommendation of state government appropriations in support of public higher education activities. Because of general interest in this subject and upon recommendation of the advisory panel, the Academy is now publishing this paper for general distribution as a part of its work undertaken on behalf of the Indiana Commission for Higher Education.

Alvin C. Eurich
President

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1 General Objectives

There are two principal objectives to be achieved in any state government procedure for providing appropriation support to public institutions of higher education. One objective is an appropriate degree of equity in the distribution of the state appropriation among the various individual institutions of higher education. The second objective is an appropriate degree of adequacy in the total support provided by the two principal sources of income for the instructional activity of public institutions of higher education: state government appropriations from general fund tax revenues and institutional charges to students for instructional service.

Before we turn to a consideration of these two objectives, however, we must make certain that there is a common understanding of the limitations and the qualifications inherent in this discussion. First of all, our attention here is concentrated upon *public* institutions of higher education in relation to state governments. There are a few public institutions of higher education in the United States that obtain their institutional support from the federal government: primarily four military academies and two or three specialized and accredited military schools plus four institutions in the District of Columbia. In addition, Howard University is certainly a "federally-related" institution. We are not concerned with these institutions here. In addition, there are two universities (The City University of New York and the University of Cincinnati) that are sponsored by municipal governments. For the most part, however, local governments are involved in the support of two-year community and technical colleges. In all instances, these locally supported colleges and universities receive some state government support. But again we are not concerned here with the procedures which are involved in providing this support. Our interest is focused upon the some 1,500 institutions geographically separated one from another, sponsored by state governments, and receiving their primary support for instructional activity from state governments.

Secondly, it must be recognized that state governments are the major units of government in the United States with authority to plan and coordinate public policy in relation to higher education. In terms of the support provided to institutions of higher education, it is estimated that in the fiscal year 1973-1974 state governments provided nearly 11.5 million dollars of income, the federal government provided around 3.7 billion dollars, and local governments provided 1.6 billion dollars. State government institutional support did not go exclusively to state sponsored institutions of higher education. Some of it went to locally sponsored institutions, and a relatively modest amount went to private institutions. Moreover, this total amount of 11.5 billion dollars does not include the 300 to 400 million dollars which state governments are estimated in 1973-1974 to have spent directly to assist students enrolled in higher education. Furthermore, not all of the income support provided to institutions of higher education by state governments is earmarked for instructional activity. Some of it is earmarked for research, especially agricultural research; some of it is earmarked for public service, especially for agricultural extension

and for public broadcasting; and some of it is earmarked for the support of medical and hospital care to indigent patients in teaching hospitals attached to a school of medicine. The variety of activities performed by public institutions of higher education will be reviewed subsequently. Here we need to be aware only that the role of state governments is quite substantial in the support of institutions of higher education, providing as of 1973-1974 the largest single source of available income.

The importance of state governments in the higher education system of the United States is evidenced also by the proportion of all students enrolled in state sponsored colleges and universities. Of the some 9.3 million students enrolled in 1973 in institutions of higher education in the United States, including public vocational-technical colleges, some 2.2 million students were enrolled in privately sponsored institutions, another 1.5 million were enrolled in locally sponsored institutions, and nearly 5.5 million students were enrolled in state sponsored institutions. (Less than 100,000 students were enrolled in federally sponsored and federally related institutions). Our state governments, especially since 1945, have been the governmental bodies making higher education widely available to the traditional college age population, and to other citizens as well.

In the third place, it must be emphasized that this discussion is concerned with the support of institutions of higher education. There are alternative approaches to the congeries of purposes which make up the realm of higher education: that is, the instruction of students, the advancement of knowledge, the promotion of educational justice, the advancement of culture and the practical utilization of knowledge, and the critical evaluation of social performance. Apart from the instruction of students, research may be carried on apart from a college or university, as is done by the National Institutes of Health, the Atomic Energy Commission, the National Aeronautics and Space Administration, and other federal and state government agencies. The advancement of culture may be undertaken through the activities of libraries, museums, art galleries, the theater, symphony orchestras, and other agencies organized and maintained apart from colleges and universities. The critical evaluation of society is carried on by media of mass communication and by intellectuals not a part of a college or university. The practical utilization of knowledge is carried on by business and industry, by agriculture, by professions, by labor unions, by voluntary groups (including voluntary and community hospitals) that are not parts of colleges and universities. Higher education engages in all of these activities in some part, but it is not the exclusive performer engaged in the delivery of these services. Supporters and enthusiasts for higher education, including this writer, would argue that support of institutions of higher education is essential to the operation of all these other activities. But our interest here is in what institutions of higher education do, and how these institutions, especially the state sponsored institutions, obtain the income essential to the performance of their activities.

In recent years in particular, in part because of federal government interest beginning with the so-called G.I. Bill of Rights enacted in 1944, a great deal of public attention has been centered upon the support of students enrolled in institutions of higher education. Enrollment in higher education in the United States has always involved cost to the student. There is the cost of whatever instructional fees or tuition the institution may fix; there is the cost of room and board if the college or university is located some distance from the home residence of the student; there is the cost of home residence if the student commutes to college; there is the cost of books, clothing, transportation, and other per-

sonal needs, including health care; and there is the cost of foregone income, the wages the student might receive if he or she were employed instead of enrolling in a college or university. State and local governments, and indeed privately sponsored institutions of higher education, long made their contribution to these costs primarily by a policy of low or even no tuition charges. It was assumed that with parental assistance and by part-time work any highly motivated student could obtain the income necessary to maintain his or her enrollment. And then gradually through gift and endowment funds colleges and universities accumulated scholarship resources for especially promising, and sometimes impecunious, students.

After World War II, access to higher education became increasingly a public issue. In part, this interest arose out of a concern for racial and ethnic justice, to rectify past patterns of discrimination which might have denied or restricted access to higher education for certain categories or groups of persons: Blacks, American Indians, Spanish Americans, and others. In part, this interest arose from a concern to promote social mobility, to ensure that promising youth of intellectual and other abilities had an opportunity to develop those abilities regardless of socio-economic status. In part, this interest arose from the continuing increases in charges to students by both public and private institutions, increases needed for additional institutional income but increases which could be offset for those of low income status only by direct financial support of students.

In any event, support of students did in fact become a major subject of public policy debate and action. This subject is a serious one deserving careful and extensive consideration on its own merits. This matter is not, however, the focus of attention in the present discussion. On the contrary, our concern here is with the financial support of institutions of higher education. It should be noted of course that there is necessarily a close relationship between the financing of institutions and the financing of students. Indeed, the interrelationship in public policy between the financial support of students and the income support of institutions of higher education is often neglected. The two matters cannot be discussed in isolation one from the other. As public policy tends to concentrate upon the support of students, there are necessarily certain impacts upon the financing of institutions. As public policy tends to concentrate upon the support of institutions, there are necessarily certain impacts upon the support of students. Both concerns must be kept in a certain balance, and it is this balance which must be considered in this paper focused as it is upon the income support of institutions, especially the income supports of state sponsored institutions of higher education.

A fourth and final qualification is needed here. This discussion is concerned with state government organizational arrangements and financial practices as they exist today. The purpose is not to advocate any change in organizational arrangements. The purpose is to advocate an improvement and refinement in financial practices. Moreover, our attention here is concentrated upon the income support for current operations rather than the income support needed for capital improvements. Obviously capital financing of needed physical facilities for institutions of higher education is essential. But capital financing is a separate subject not included in this discussion except as such financing is reflected in current operating appropriations for debt service. Our interest here is exclusively income support of the annual operating budget of state government sponsored and supported institutions of higher education.

The Objective of Equity

State governments have found it desirable to establish and to support different kinds of colleges and universities. The differences are to be found in organization, and the differences are to be found in program. The history of higher education in no two states is quite the same, and the current structures in one state are not quite the same in any other state. In general, many states went through some four major periods in their response to the higher education needs of their citizens. The first period before the Civil War was one in which many states established a state university, in reality a college in the classical tradition. The second period began with the federal government's enactment of the Morrill Act of 1862. Some states created new and separate colleges of agriculture and mechnical arts; some added the new land grant endowment to their existing state university. In addition to schools of agriculture and of engineering, an era of expansion into various fields of professional education continued throughout the years from 1870 to World War I. The third period was occasioned by the great expansion in public school education, especially the expansion of secondary education occurring in the years from 1890 to 1914. In this period state boards of education began to establish teachers colleges in order to provide the staffing needed by local school districts. The fourth period of development was that of the junior college movement, which from its early emphasis upon two years of college transfer education moved in the late 1950's and the 1960's to embrace vocational-technical education. This two-year college activity was in many states also directed by state boards of education. Although these periods of expansion are observable in many states, it must be emphasized again that in no two states was the response to these felt needs quite the same.

By 1970 in any event, many states had a situation in which there were multiple structures of higher education. Moreover, during the great increase in student enrollments occurring between 1950 and 1972, there was a tendency for institutions of higher education sponsored by state governments to broaden the scope of their program activities. Many state universities became leading research universities; colleges of agriculture and mechnical arts became state universities and some of them became leading research universities. Teachers colleges became comprehensive state universities offering programs in the arts and sciences and various professional fields in addition to a program of teacher education. Some states established separate professional schools as in medicine and in other health professions. The junior college became the community college, and in other instances state governments which had not directly encouraged community colleges found it desirable to encourage the establishment and operation of vocational-technical colleges.

In organizational terms, some state universities became multicampus universities; in other instances state governments themselves enacted laws consolidating various institutions under new governing boards. In a few instances state governments actually established a single or a dual structure of higher education institutions: one structure for four-year and graduate education under one governing board and a second structure for two-year institutions offering college transfer and vocational-technical education. Where there were multiple state university and two-year institutional structures, most state governments found it desirable and necessary to create a state board of higher education with authority for planning and coordinating the state government interest in higher education.

The simple fact is that all fifty state governments (plus the District of Columbia and federal territories for which the Congress of the United States is in effect the state legislature), with only one or two exceptions, have more than one campus constituting in reality a state sponsored institution of higher education. And each campus tends to offer not one but usually several different higher education programs. As a consequence, each state government must confront the question of how it is to achieve some appropriate degree of equity in the provision of state appropriation support to these various campuses and their various programs.

In every state there is essentially only one alternative to this issue of state appropriation support. The choice is between political competition among the several institutions or some kind of objective formula to distribute the appropriation support on an equitable basis. That most states have consciously chosen the second in preference to the first procedure is readily understandable. A political power struggle between institutions of higher education in various states is by no means unknown. It has occurred in various states at various times. The goal has been for one particular state institution to obtain some competitive advantage in financing or in legal status over other state institutions of higher education. The success of such an effort depends in large measure upon the kind of help obtained from the state legislators of the area, and upon the influence of these legislators in the state legislature itself. If the assistance of the governor and his staff can be enlisted in the same effort, so much the better; being state-wide elected officials, however, governors are less prone than locally elected legislators to favor one area of a state over another.

The quest for political advantage on the part of a single state university inevitably results in the generation of counter pressures on the part of other state universities and their political adherents. Moreover, legislative disagreement based upon competing desires and aspirations of state universities located in various areas of a state may mean no legislative action. As a consequence, sooner or later state universities have found it desirable to work together rather than to engage in bitter conflict, and sooner or later state governments have found it desirable to establish state administrative mechanisms designed to bring a state-wide point of view to bear upon the problems of higher education.

And high upon the list of these problems is that of the distribution of available state appropriations in support of the current operating programs of the state sponsored and supported institutions of higher education. To be sure, from the point of view of the institutions themselves the first goal in the past twenty-five years has been to obtain desired increases in the total appropriations made in support of higher education. But state governments usually perceive some upper limit to what they can and will provide in support of higher education programs and institutions. The distribution of this appropriation limit among multiple institutions of higher education then becomes a critical issue of state government appropriation policy and practice.

As a matter of general public policy it is relatively easy to declare that state government appropriations in support of institutions of higher education shall be based upon the principle of equity. As a matter of administrative and legislative practice, the deter-

mination of what constitutes equity in the provision of state government appropriation support is not so simple. Institutions of higher education have many good reasons to offer why they need and could well use more income. In addition, public institutions have had a different history one from another and so they perceive their role and their income needs as being different.

For example, there has usually been in each state one state university that may claim to have been, or to continue to be, the "flagship" university of the state. Flagship status rests upon age, upon an extensive scope of professional programs of instruction, upon the development of a wide variety of doctoral degree programs and of substantial research capabilities, and upon a record of quality achievement in the performance of many activities. The flagship university understands its role to be that of state-wide and even of national service. And it sees its income requirements as quite different from those institutions that formerly were teachers colleges or urban universities. In some twenty states, the flagship university was separated from the 1862 land-grant university, and in these instances rivalries for status and appropriation support inevitably arose.

As higher education demands and expectations increased substantially during the 1950's and the 1960's, neither the flagship universities nor the 1862 land-grant universities could meet all the expansion needs. As a result teachers colleges became state universities, urban universities became state universities, and new state universities were established. In some instances various existing state universities established new campuses in different urban locations. All of these developments created new demands upon the state government appropriations in support of public higher education.

The objective of equity in the distribution of state government appropriations is to provide income to the various state higher education institutions and campuses on the basis of "to each according to its needs." When the total state appropriation available in support of higher education is less than the total amount each institution and each campus sees as its need, then some kind of distribution formula is essential.

What then constitutes equity in the distribution of state government appropriations? To some the concept of equity is confused with the concept of equality. Why not give the same amount of money to each institution and to each campus? Since institutions and campuses vary considerably in enrollment size, the concept of equality then is translated into providing the same amount of state appropriation income per full-time equivalent student. But since program offerings of institutions are different, and since program costs vary (it is more expensive to offer a medical education program than to offer a business administration program), then the whole matter of program differentiation among institutions must be resolved. Because state institutions of higher education differ among themselves in terms of programs and of enrollment size, equity in the distribution of the state appropriation requires a differentiation according to enrollment and a differentiation according to programs.

The whole subject of enrollment size in an instructional program is a complication. The phenomenon of "economies of scale" operates in a higher education institution even as it operates in other kinds of enterprises. Although the matter has not been studied as it deserves, costs of instruction per student at the margin are different from average costs of instruction per student. One more student or two more students — perhaps ten or twenty more students — may be added to an instructional program without much if any additional instructional cost. The average cost per student is reduced usually as student

enrollment in a program increases. But when enrollment declines, average costs rise because it is not possible to adjust instructional costs on a pro rata basis. If an instructional program is still to be offered, then faculty salary and other costs of operation remain relatively fixed. Thus enrollment size and enrollment trends become a major factor in defining a practice of equity in the distribution of state appropriations.

There are other complications as well, particularly complications of location and clientele served. It has long been known in the United States that the location of campuses has much to do with the propensity for young people to enroll in higher education. The closer a college or university is to the home of a young person, the more likely it is that young persons will enroll as students. Moreover, if students are to be enrolled on a part-time basis while employed (on jobs or in care of a family), then colleges and universities must be located near the place of employment or of residence. Sometimes an adequate geographical distribution of institutions and of instructional programs becomes a public policy objective having a greater priority than economies of scale.

And some institutions may be developed to meet the higher education needs of a special clientele: a particular ethnic group (Blacks, Spanish-speaking, Indians, and others) or a particular economic group (low income, unskilled) or a particular personal characteristic (the deaf, the handicapped, the slow-learner). When public policy decisions dictate the establishment and support of institutions with a special clientele, then once again considerations of enrollment size are subordinated to other objectives. In these circumstances, a practice of equity in the distribution of state appropriations means recognition of the particular purposes of an individual college or university.

The concept of equity is also confused on occasion with the whole subject of quality in higher education performance. There is no aspect of higher education more surely guaranteed to arouse emotions and misunderstandings than this matter of quality. The fact is of course that higher education as practiced in the United States is heavily oriented to the cognitive skills of individuals, and the further fact is that these cognitive skills are distributed unevenly among any particular population cohort. Some persons have a highly developed or potential cognitive skill and other persons have lesser developed or potential cognitive skill. Ordinarily, educational philosophers and administrators are wont to declare that the goal of higher education is to develop cognitive and other skills of an individual to the maximum of the individual's potential and interest. In practice, this goal implies a substantial variation in standards of expected academic performance.

The high quality college or university tends to be one that enrolls a high proportion of those students with a high potential for achievement in the exercise of cognitive skills. A high quality university tends to be one that has a high proportion of faculty members actively and productively engaged in research and public service. High quality often is associated in the public mind — and in the academic mind — with the offering of doctoral degree programs. Sometimes there are other indices of quality employed in the effort to assess qualitative achievement.

The aspect of quality to be considered here is whether or not the quality of an institution or campus does and should vary with the amount of state government support provided. It is usually expected that the more income a college or university enjoys, the higher quality it will maintain in its educational activity. High income permits a lower student-faculty ratio (a supposed index of quality), a larger expenditure for books and equipment (another supposed index of quality), and more time for faculty members to

engage in research and public service (another supposed index of quality). The question is then asked whether or not a state government ought not to provide at least one (perhaps more) institution of higher education of high quality. If so, then increased income must be distributed to the high quality institution or institutions.

In recent years, the quality debate has taken a new turn in state government decision-making. As more students of average cognitive skill and even of below average cognitive skill are enrolled in higher education, then the question arises whether or not it doesn't cost more to educate the lower quality student than the higher quality student. Some educators argue that cost is associated not with skills as such but with the "value added" to an individual's skill through higher education. And there are some persons who insist that the costs of higher education should be equated with the employability gained by an individual.

Enough has been set forth here to demonstrate that in practice the objective of equity or fairness in the distribution of state government appropriations for higher education is not easy to define or to carry out. I believe that a workable definition of equity in state government decision-making is to provide the same income resources from state appropriations to each institution of higher education for each full-time equivalent student enrolled in comparable programs of instruction. How this definition is to be applied will be set forth in a subsequent section. But I recognize that there are special circumstances of enrollment size, location, stage of development, and of clientele served which require modification of or exceptions to this definition.

What then about qualitative differences? I think there are such differences among institutions and among students. But I do not know of any basis for saying that high quality deserves higher income or for saying that poorer quality deserves higher income. For this reason I am disposed to recommend that state appropriation distribution be based upon an equal resource support per student by program and by program level. Other sources of income can then provide the margin of difference which circumstances require.

I think we must justify this definition of equity in terms of the basic philosophy of higher education and in terms of the tradition of equality of opportunity in a democratic society. If we are striving to achieve equality of opportunity and if we are striving to encourage persons to develop their cognitive and related skills to their fullest potential, then I believe no other definition of equity is defensible. And the objective of equity becomes then an essential of state government appropriation practice.

In essence, this paper is an effort to define equity in the distribution of appropriation support by state government to state institutions of higher education. The devising of practical means for achieving the objective of equity is our subject of discussion. It is not necessary here then to anticipate the various important details of this discussion. It will be sufficient at the moment simply to outline the three primary ingredients in an operative definition of equity.

These three ingredients are: (1) appropriation support based upon program costs; (2) appropriation support based upon work load; (3) appropriation support based upon a common definition of available income. These ingredients will be considered at length in the subsequent sections of this paper. It must be emphasized again that the concept of equity does not mean a distribution of support involving the same amount of money for each institution regardless of size, or the same amount of money per student regardless of programs offered. There will be differences in the support to each institution based

upon work load and program differentials. Such differences are important characteristics of a concept of equity. The essence of equity is that state institutions of higher education shall be treated the same in terms of work load and in terms of program offerings.

The Objective of Adequacy

If the concept of equity is difficult to define in operational terms, the concept of adequacy in the appropriation support of state higher education is even more obtuse. Yet it is a concept which must be carefully considered for two important reasons. Institutions of higher education may vary in size, and economies of scale favor the institutions with the largest enrollments and the most extensive array of program activities. On the other hand, the public policy decision to bring some institutions and some programs within the commuting distance of most students in a state may dictate small size and high cost programs. Institutions should not be penalized in their appropriation support simply because public policy actions may have resulted in a relatively more costly operation than that of other institutions. But there is a second and more urgent reason for a concern with adequacy which applies to all state institutions. This reason is the need to consider appropriation support and the authorization of tuition charges to students as interrelated parts of the total support available for instructional services.

For many years in many states institutions of higher education presented to the governor and the legislature their estimates of their needs for appropriation support from the state's general revenue fund. If the state executive and legislature decided that they could not provide the appropriation support desired by the institutions of higher education, the institutions still had an additional source of instructional income available to them. That source was the tuition charge to students. When the appropriation process was completed, the state institutions of higher education then decided each for itself whether or not the amount provided was adequate for the planned operations of the next year or the next biennium. Obviously each institution had to make a decision about what income level constituted adequacy for the programs of that institution. If the appropriation support was considered to be inadequate, increases in the tuition charges to students might be ordered by the governing board of the institution. And this very kind of procedure did take place in a great many states in the years after 1945. Indeed, it may be said that the program of educational benefits to military veterans enacted by the federal government in 1944 encouraged state universities and colleges to increase their charges to students. For a large number of students, the veterans, the federal government was paying this increased charge in any event.

During the late 1960's and the early 1970's the whole subject of tuition charges to students by state universities became an important issue of state government policy. The result was that no longer were the governing boards of state universities left free to determine tuition charges to students as they might see fit. Rather, state governors and state legislatures began to make decisions about tuition charges when they made decisions about appropriation support. In some instances, appropriation support at less than the amounts considered to be adequate by institutional administrators and their governing boards was accompanied by a prohibition in the appropriation law against any increase in tuition charges. This action was sometimes brought on by a threat of institutional representatives during the appropriation process to increase tuition charges if

satisfactory appropriation support was not received. The immediate response of legislators to such a threat was to prohibit tuition increases, regardless of the financial problems thereby created for particular institutions. In other instances, governors and legislators favored increased tuition charges as an alternative to increased taxes in order to provide an adequate level of income to state institutions of higher education. In either kind of situation, some operational definition of adequate support for the program operations of an institution of higher education was involved.

When a legislature prohibits increases in tuition charges to students, it is making a decision about what constitutes adequate support for the instructional programs of a state university or college. When a governor and legislature recommend increases in tuition charges as an alternative to the desired increases in appropriation support, they are making a decision about the adequacy of the income requirements of institutions of higher education. Thus, no matter how difficult the concept of adequacy may be to define, in actual state governmental practice some kind of definition is being provided during the appropriation process.

As a consequence, it is essential that governing boards of institutions of higher education and that state boards of higher education prepare their own definition of what constitutes adequate income for the various programs offered. Indeed, under current circumstances some kind of definition of adequacy can not be avoided. The definition may, of course, be implicit rather than explicit. The definition is not the less real for this circumstance. If the appropriation process is to achieve a satisfactory degree of rationality, then it is preferable that the definition of adequacy be explicit.

There is no need at this point to begin a detailed discussion of the various aspects of adequacy in the income support of higher education. This effort will occupy our attention in subsequent sections of this paper. We can observe here simply that adequacy involves issues of program objectives, program size, program technology, and program support. At any given point in time the first operational definition of adequacy tends to be incremental, to be somewhat larger than the present level of support. The very essence of planning, programming, and budgeting in higher education is the search for adequacy.

The Means for Achieving Equity and Adequacy: The Budget Formula

It is not necessary here to review in any detail the kinds of budget formulas or calculations which have been used in various state governments in order to achieve the objectives of equity and adequacy in the appropriation support of state institutions of higher education. There is a recent study by Francis M. Gross which provides this kind of information.[1] Those who have had experience with budget formulas recognize that there are difficulties or deficiencies as well as advantages in their use. Much depends obviously upon the degree of sophistication and the degree of caution with which such formulas are employed.

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[1] Francis M. Gross, "A Comparative Analysis of the Existing Budget Formulas Used for Justifying Budget Requests or Allocating Funds for the Operating Expenses of State-Supported Colleges and Universities." A Summary of a Dissertation (mimeo), Office of Institutional Research, The University of Tennessee.

There are several kinds of criticisms which are often made about the formula approach to state appropriation support. One criticism is that the formula does not recognize the varying quality of the programs offered by state colleges and universities. The common assumption is of course that there are variations in quality among institutions as well as among program activities, and that somehow there is a variation in cost, and hence in income needs, that reflects this difference in quality. There is a further implicit assumption in this criticism: the higher the quality of a program the more it will cost, and so the more income it ought to have. The difficulty with this criticism is that it fails to provide any definition of quality other than high cost and fails to explain why quality depends upon high cost. Furthermore, if there are differences in quality among programs offered by state colleges and universities, is this a situation which should be encouraged by state appropriation support?

A second criticism is that budget formulas tend to impose a "leveling" effect upon the quality of programs. If state institutions of higher education receive the same appropriation and tuition support per student, then they are all being placed in the same kind of financial circumstance, and each institution becomes the pale shadow of all others. The difficulty with this criticism is that it ignores the possibility of other kinds of income which institutions may obtain in addition to state appropriations and tuition charges. These other sources of income may promote differences among institutions. But the other, more important, defect in this criticism is that it fails to explain what differences in cost and income are desirable or necessary between state institutions of higher education enrolling students in the same or comparable instructional programs. Until justifiable differences in expenditure and hence in income needs can be explained and are acceptable as desirable public policy, then this criticism has little validity.

A third criticism is that budget formulas may lead to a deduction of income received by an institution from sources other than state appropriations and tuition charges. Undoubtedly there are some state budget offices and state legislatures that have taken such action. But where this has occurred, the fault may be with an inadequate formula rather than an inherent defect of the formula procedure. Or the action may reflect political response to appropriation demands rather than a careful analysis of an institutional situation. A formula can and should seek to avoid this kind of criticism.

In addition, there are certain technical criticisms which have been made about the operation of certain particular formulas in certain specific situations. On occasion, a particular formula has been criticized as failing to estimate adequately the cost requirements of particular programs. On other occasions, a particular formula has been criticized as perpetuating inequities among institutions that existed prior to the development of a formula. And in recent years, as enrollments have stabilized or even declined in some state universities and colleges, the criticism has been made that "enrollment-driven" formulas have been inadequate to changing circumstances. To some extent each of these criticisms may have had validity and each needs to be considered in the development and use of budget formulas.

At the same time, several advantages to the formula approach have been widely recognized and acknowledged. The formula procedure does provide an objective method of formulating the instructional expenditure and income needs of state institutions of higher education on an equitable basis. Budget formulas can reduce or eliminate political competition among state institutions. Budget formulas provide state budget officers,

governors, legislative budget officers, and legislators with a reasonably simple and understandable basis for handling the expenditure and income needs of state institutions. Budget formulas enable individual institutions to project their future expenditure and income circumstances on a timely basis. And budget formulas represent a reasonable compromise between public accountability for state institutions and institutional autonomy. This last advantage in and of itself is of major importance.

The budget formula is the best available procedure thus far devised to achieve a satisfactory relationship between state government and state institutions of higher education in providing desirable state appropriation support for instruction. As such, a budget formula needs to be developed and utilized which maximizes its utility and minimizes its possible deficiencies.

2 Expenditures by Programs

Institutions of higher education operate various kinds of programs in the performance of their objectives and in the effort to achieve their purposes. The planning endeavor in an institution of higher education formulates purposes and objectives; the operation of an institution of higher education requires the performance of programs. And it is these programs which must have income in order to meet their costs.

Many institutions of higher education in the United States have not yet begun to feel comfortable or familiar with a program basis of operation. As the management of institutions of higher education has become more sophisticated, more carefully planned, and more costly, a program basis of operation has become more and more widely utilized. Program budgeting has become one of the major techniques of the "managerial revolution" as an advancing management science has made its impact upon higher education in the United States.

Recommended budgeting and accounting procedures for colleges and universities have long recognized certain broad functional categories of expenditure. These functional categories as first developed in the 1930's recognized three major groupings: educational and general expenditures, auxiliary enterprise expenditures, and student aid expenditures. Within this three-fold classification, there were several subgroupings. Over the years this standard form for financial reporting became the basis for federal government statistical collection and presentation, and for the financial practices of many institutions of higher education. In due course various modifications of a relatively minor nature have been made in this budgeting and reporting practice.

During the 1960's, as enrollments expanded, as costs increased substantially, and as governments became more and more concerned about the utilization of the income provided to institutions of higher education, budget improvements of various kinds were proposed. Many of these improvements were developed within the Western Interstate Commission for Higher Education, which eventually established with federal government financial support a National Center for Higher Education Management Systems (NCHEMS). Without tracing the history of these activities or reviewing the details of the management systems developed, we can as of mid-1974 rely upon two basic documents to provide the essential framework of a program budgeting system. These basic documents are the *Interim National Standard Procedures for Deriving Per-Student Costs in Postsecondary Educational Institutions*, a staff paper published by the National Commission on the Financing of Postsecondary Education, and Part 5 of *College and University Business Administration*, a manual of recommended practice published by the National Association of College and University Business Officers.

The primary base upon which a program budgeting system must necessarily rest is a program classification structure. Such a structure must begin with activity centers or cost centers within the organizational structure of a college or university. An activity center is an identifiable management unit assigned a definite budget of approved costs, having a

recognized production technology, and producing an out put essential to an objective of the institution. Under the program classification structure devised by NCHEMS and published in 1972, program elements are grouped into program sectors, sectors into subcategories. subcategories into categories, categories into subprograms, and subprograms into programs.

For our purposes here we shall make use of the chart of accounts and the general program classification recommended by NACUBO as of 1974. This program classification structure is shown in Chart 1 herewith. This chart of accounts shows four broad groupings: educational and general. auxiliary enterprises, hospitals, and independent operations. Within the broad grouping of educational and general, there are eight program categories: instruction, research, public service, academic support, student services, institutional support, operation and maintenance of plant, and student aid (scholarships, fellowships, and grants). Another category is that of mandatory transfers. It is these program categories that are the principal program areas in which a state budget formula would be operable, and each of these eight program areas will be the subject of discussion in a subsequent section of this paper.

Before we begin consideration of the educational and general expenditures of colleges and universities, however, some attention must be given to the other three major program groupings: auxiliary enterprises, teaching hospitals, and independent operations. These are areas of operation where a state appropriation formula would not be operable. In fact, state governments usually do not provide any operating income for auxiliary enterprises or for independent operations.

Auxiliary Enterprises

Colleges and universities located in relatively small urban communities will ordinarily enroll all or a substantial part of their student body on a residential basis. This means that the student becomes a separate family unit, living apart from his or her parents. The individual student or the student family (spouse and children) require housing, and this housing may be provided by the community (rental and owner dwellings) or by the institution of higher education. Many colleges and universities have found it desirable or necessary to build and operate residence facilities for students, either for single students or for married students or for both. When a college or university does so, it is engaged in a housing program, which is thus a part of the auxiliary enterprises of the institution of higher education.

Similarly, many colleges and universities have found it desirable or necessary to build and operate feeding facilities, primarily for the single student. These dining halls become a separate program, the food service program of the institution, another kind of auxiliary enterprise. Colleges and universities usually separate the housing program from the food service program for both management and cost reasons. The two programs require quite different kinds of activity and hence quite different personnel, and the housing program may accommodate more or fewer students than the food service program. When the student clientele for both housing and food service are exactly the same, the two may be handled as one activity and cost center, although this appears to me to be an undesirable management practice.

CHART 1

RECOMMENDED STATEMENT OF CURRENT FUND EXPENDITURES FOR A COLLEGE OR UNIVERSITY

Educational and General Expenditures

Instruction
Research
Public Service
Academic Support
Student Services
Institutional Support
Operation and Maintenance of Plant
Scholarships, Fellowships, and Grants
Mandatory Transfers

Auxiliary Enterprises, Hospitals, and Independent Operations

Auxiliary Enterprises

Auxiliary enterprises may be divided into various subprograms, such as residence halls (dormitories), food service, student health service, student recreation service, student organizations, student cultural activities, student or university centers, university assembly facilities, and intercollegiate athletics. Within these subprograms there may be both current operating expenses and mandatory transfers for debt service and equipment service.

Hospitals

Hospital expenditures may include medical service, patient care, clinical expense, laboratory expense, plant operation, administration, and mandatory transfers.

Independent Operations

Independent operations may include specific laboratories or other centers operated by a college or university but wholly supported by some external source of financing: a separate endowment fund, a state or federal government contract, a private grant made for a period of time.

Some colleges and universities, whether enrolling primarily a residential or a commuting student body, have established a student health service. The service may be only a dispensary for first aid or elementary care, or it may be the equivalent of a community hospital. Because some small urban communities were not equipped with facilities and were not staffed with medical personnel to meet the health care needs of both the local population and the student population, institutions thought it necessary to provide their own "health maintenance organization."

State colleges and universities may provide an extensive array of other auxiliary services: a book store, a recreation program, a social program, a student publications program, a cultural program of music and special lectures, and intercollegiate athletics. The scope of the auxiliary enterprises undertaken by a college or university depends primarily upon the extent to which the institution seeks to become in effect a self-contained social community.

Auxiliary enterprises have one primary characteristic in common: their costs are supported by user charges; that is, by prices paid by students and other purchasers of the service provided. Moreover, usually the prices charged must meet all current operating expenses, debt service charges for repayment of any bonded indebtedness incurred in building the necessary physical plant facilities, and the needs of an equipment or replacement reserve. In some instances state universities and colleges levy a compulsory service charge with which to help defray the costs of some or all of their auxiliary enterprises. In other instances, students pay only for such services as they may actually consume. Many services of auxiliary enterprises are available to alumni, faculty and staff members, and even the outside public. In these instances the consumers pay a price for the service received.

State governments for the most part have enacted laws authorizing governing boards of state universities and colleges to operate various auxiliary services, to incur a bonded indebtedness to meet capital expense, and to fix prices or a compulsory service charge to meet the operating and debt service expenses of these enterprises. For the most part, state governments do not appropriate any tax funds for either the operating expenses or the debt service expenses of auxiliary enterprises. The operating and financing authority for auxiliary enterprises is vested in the governing boards of state universities and colleges and not in state governments as such.

Accordingly, state government boards of higher education, budget officers, governors, and legislators are not directly concerned with the income and expense of auxiliary enterprises. Sometimes state laws have imposed restrictions upon the scope of auxiliary enterprises or upon the charges for auxiliary services. The usual reason for these restrictions is a fear that governing boards may expand their auxiliary services beyond a reasonable prospect for their self-contained financing. And on occasion private business enterprises have complained that state institutions of higher education were providing services to students and others which they were competent to provide.

In a comprehensive state budget system, state governments may properly expect "annex" budgets of state universities and colleges to report the income and expense of their auxiliary enterprises. But this financing is not usually a matter of concern for the state government appropriation process, or for a state government budget formula.

Hospitals

State universities with a college of medicine and separate state colleges of medicine usually operate a teaching hospital as a necessary part of their educational activities. The education of medical students involves clinical experience: the experience of actual contact with persons requiring medical care. While studying for the M.D. degree the medical college student is mostly an observer, although the student may help prepare medical case histories and perform minor care. After receiving the M.D. degree, the young doctor serves a period of time as intern and resident which involves the practice of medicine under the general supervision of a clinical professor. Interns and residents also contribute to the instructional process by discussing patient care with the medical students.

The patient in a teaching hospital receives both hospital care and medical care while at the same time being the subject of staff and student attention. In fact, it is generally thought that patients in a teaching hospital receive a superior quality of medical care to that available in many community hospitals. Teaching hospitals, moreover, purposefully encourage the admission of patients with unusual diseases or disabilities, as well as patients whose malady is especially difficult to diagnose. Obviously such patients are particularly costly in the extent and scope of the medical care they receive. In addition, in large cities, medically indigent patients are often referred to teaching hospitals because these hospitals do receive public funds with which to operate and presumably are in a better financial position to provide medical and personal care to indigent persons than are other hospitals.

When a state university or a state medical college operates a teaching hospital, that hospital will necessarily have to receive a state government appropriation with which to operate. Even if all patients receiving medical and personal care in a teaching hospital had medical and hospital insurance or other resources with which to meet the charges for their care, the teaching hospital would still require state government subsidy. As mentioned earlier, the costs of operation of a teaching hospital are higher than those for a community hospital. Substantial research may be carried on in a teaching hospital, and the medical faculty will usually make use of the hospital to advise and assist other doctors outside the hospital in keeping current with the most recent medical knowledge about patient treatment. The number of interns and residents in a teaching hospital is larger than in a community hospital because of their role in medical education.

It is highly desirable that the operating expense of a teaching hospital be separated from the other operating expense of a state university or of a state medical college. The expenses are so large that they will distort total costs of a state university if these are simply absorbed under some other program category. Moreover, these costs are applicable only to the state institution offering medical education, and only a few state universities will be involved in the operation of a teaching hospital. It is essential to know these costs as a part of the expense of providing medical education, including medical continuing education. In addition, a separation of teaching hospital costs from the costs of medical education focuses attention upon the gap between patient income and total costs. This gap needs continuing attention.

There is no simple or ready-made formula available by which to determine the state government subsidy need of a teaching hospital. On the one hand, a teaching hospital incurs costs of medical care to patients (a part of the salary of the clinical faculty, a part of

the salary of interns and residents, the salaries of nursing personnel, the salaries of laboratory technicians, costs of hospital care (food, ward care, etc.), costs of laboratories and drugs, costs of supplies and equipment, costs of plant operation, and costs of management. Against these costs the teaching hospital will produce income from payments by patients or by third parties. Between these costs and these payments is the gap which can only be met by an operating subsidy from state government.

The costs of operation for a teaching hospital have been rising rapidly in the past ten years, and no doubt will continue to rise in the years ahead. Fortunately, the income of teaching hospitals will continue to increase as more and more persons enjoy the benefit of medical and hospital insurance or receive medicaid. The number of persons in the population classified as medically indigent should decline in the years ahead. But there is no reasonable prospect that teaching hospitals will ever be able to balance their costs and their direct income. The educational function of the teaching hospital requires subsidy, and the extent to which the teaching hospital provides medical and hospital care to the medically indigent requires subsidy.

There is no choice available to state budget officers, to state governors, and to state legislators except to provide a subsidy of the teaching hospital. Costs, income, and subsidy should be carefully scrutinized, and costs should be compared with those of community hospitals to determine whether or not the higher costs at the teaching hospital appear to be reasonable. The gap between costs and available income will be the subsidy need of the teaching nospital.

Independent Operations

In a few instances state universities may operate a major research laboratory, an important service center, or other facility under contract with a federal government agency or under contract with a state government agency. The difference between an independnet operation and a regular or integrated operation for research or public service consists in two characteristics. In the instance of an independent operation, the capital plant involved is a facility built and owned by a federal or state agency other than the state university itself. Secondly, the operation of the facility is handled by contractual agreement between a government agency and the state university. The appropriation for the operation is received by the government agency. The state university is an independent contractor who has agreed to operate the facility.

It is not necessary here to explore the reasons why such a contractual arrangement may be mutually advantageous to a government agency and to a state university. It is sufficient to note that, if the operation involves a highly technical and scientific activity requiring a large proportion of highly educated personnel, there are very good reasons why the operation should be handled by a state university or by a private university.

The category of independent operations is an important one to include in the budget and operating statements of a state university. Such inclusion is essential in order to provide a comprehensive record of the total operations of the state university Beyond this concern with comprehensive reporting and accountability there is another consideration the state university is expected through its contractual agreement for operation of an independent facility to receive in income under the contract the full direct costs of operation, including an appropriate allowance for overhead. Ordinarily state univer-

sities do not agree to provide any subsidy for the independent operation. If a subsidy should be involved, this fact is an important item for review and approval during the state government budget process.

In most instances state universities and state colleges will not be involved in the performance of any independent operation. Accordingly, this is a program category to be found only in the budgets and financial reports of a very few institutions of higher education sponsored and supported by state governments.

Educational and General

When we turn away from the program categories of auxiliary enterprises, hospitals, and independent operations, we have remaining the very broad category of programs listed under the heading of Educational and General. In the NCHEMS program classification structure these various activities are grouped under two subheadings; primary programs and support programs. The activities of instruction, research, and public service are referred to as primary programs. I think "student aid" should be added to this listing. The other program groupings are referred to as support programs.

This differentiation between primary programs and support programs is a useful distinction to make. The primary programs involve the accomplishment of the end purposes of an institution of higher education. The support programs involve the management of an institution of higher education as a discrete enterprise. Support programs comprise those activities necessary to maintain the institution as a viable organizational entity. Sometimes these support programs are referred to as the "overhead" or "indirect" costs of an institution of higher education.

The eightfold recommended classification of educational and general programs, plus a category of mandatory transfers, has been listed earlier. It is not necessary to repeat these categories of activities here. Each one will be the subject of extended discussion in later sections of this paper. It should be noted, however, that this program classification and financial reporting structure represents broad groupings of related programs, of programs having certain common characteristics. It seems to me that program definitions within a university or college must relate to units of activity less extensive in scope than these general classifications. Thus, instruction is not a program but a purpose of a university or college. Within this category of instruction as a purpose there may be one or several different instructional programs.

State governments in their appropriation support of higher education are particularly concerned with educational and general operations. For this reason, it is necessary to consider each one of these program categories in some detail insofar as both expenditure and income are concerned. This will be done in subsequent sections.

Objects of Expenditure

Up to the present point in this discussion we have been concerned with program categories which will appear in the budgets and appropriations for state institutions of higher education. It is necessary to pause here to acknowledge that budget and accounting practice require classification by object of expenditure as well as by program category and cost or activity center. The financial accounting and reporting manual of the

National Association of College and University Business Officers says that three major object classifications are to be found in most colleges and universities: personnel compensation, supplies and expenses, and capital expenditures.

In my own judgment most state governments will desire a somewhat more extensive classification than this threefold arrangement. Moreover, capital expenditures would not ordinarily appear in the accounts for current operations. It seems to me that the same classification structure for all programs and for all cost centers is desirable, such as the following:

01 Personnel Compensation
- 011 Salaries and Wages
- 012 Retirement Benefits
- 013 Other Benefits

02 Supplies and Expenses
- 021 Supplies
- 022 Telephone Service
- 023 Other Communication Service
- 024 Printing
- 025 Travel
- 026 Contractual Services
- 027 Other Expenses

03 Equipment
- 031 Replacement Equipment
- 032 Additions to Equipment

04 Grant Payments

05 Transfer Payments

The extent of the objects of expenditure utilized by a state university or college will depend in the first instance upon the budget requirements of the state government. A more detailed classification, incorporating state government requirements but moving beyond those requirements, may be developed to meet internal management needs. I would think that too elaborate a classification of object of expenditure would be expensive to maintain and would provide information in greater detail than would be used for management information and review.

Restricted versus Unrestricted Expenditures

The sample statement of current funds expenditures developed by NACUBO, in accordance with a standard practice earlier recommended by the American Institute of Certified Public Accountants in their guide for the audits of colleges and universities, proposes that all expenditures in each year for each program category be reported under one of two headings: unrestricted and restricted.

The audit guide of the AICPA says only that unrestricted expenditures are those subject to determination by the governing board of an institution of higher education. The

restricted expenditures are those specified by an outside agency, such as the terms of a grant or gift from an individual, a private foundation, a federal government agency, or some other agency.

The concept of dividing all program expenditures, and all income, into two categories, unrestricted and restricted, seems to me to be a definite advance over earlier recommended budget and reporting practice. Among the unique characteristics of an institution of higher education is that it operates programs of a varied nature and produces multiple kinds of outputs. And institutions of higher education have multiple sources of income. The appropriations of a state legislature to a state university and to a state college are not the exclusive source of operating income for these institutions. Indeed, in a large state research university with an extensive array of auxiliary services, the state appropriation in support of the institution is likely to be only about one-third of total operating income. The remaining two-thirds of available income will come from a wide variety of sources, including federal grants and contracts, student tuition, private gifts, endowment income, sales and services of educational departments, and sales and services of auxiliary enterprises.

In many states a state university and a state college will have the legal status of a body politic and corporate. This kind of status should be conferred upon the governing board of all state institutions of higher education. This status in effect is recognition of a state university and of a state college as a government corporation. A government corporation differs from an ordinary state executive department or other state administrative agencies in that it obtains a substantial proportion of its income from other than state government appropriations and exercises authority to retain and disburse its income through its own administrative operation. State universities should be encouraged rather than discouraged from obtaining income from all available sources, and they should be encouraged to defray as much expense as possible from restricted funds.

The problem for state government budget and appropriation practice is to decide just what income and hence just what expenditures shall be classified as unrestricted and as restricted. The problem in this respect for a state university is somewhat more complicated than it is for a private university or college. In the instance of a private university or college the distinction is relatively simple to define and to use. In the instance of a public university the distinction is not so simple.

For example, shall all of the state government appropriation be defined as unrestricted income? I think not. Those parts of the state appropriation restricted in use to the subsidy of a teaching hospital, to the operation of the agricultural experiment station, and to the operation of the cooperative agricultural extension service must surely be considered as restricted income. The state government may provide appropriations for other earmarked purposes. In all of these kinds of situations, the income is not available for any purpose that the governing board may designate; the income must be expended for the designated service.

Similarly, there is a complication in connection with the charges to students in state universities. Apart from the room and board charges, many state universities may levy as many as three kinds of charges to students, in addition to miscellaneous charges for special services such as diplomas and copies of the student transcript. Many state universities levy an instructional fee (tuition), a student services fee, and a facilities fee (to meet the costs of debt services on academic or other plant). Are all three fees to be defin-

ed as unrestricted income? I think not. There is no doubt in my mind that the facilities fee is restricted income, income available only for transfer to a debt service account. Moreover, if a state university does levy a student services fee, then I think that income should be used only to support the operations of the designated student services. This income is restricted income in the sense that it can and should be utilized solely for specified purposes.

Under the new budget and accounting practices recommended by the AICPA and NACUBO, it seems to me that state boards of higher education and other state government budget officers will have to establish some common definitions to be observed by all state institutions of higher education about what constitutes unrestricted and restricted income. Moreover, this definition must be made in terms of the interest of state governments in their relationship to state sponsored and supported institutions of higher education.

My recommendation would be that state governments define as unrestricted income only the subsidy appropriation for the general operation of the state university or college, and the instructional charge levied upon students. All other state appropriations, all other charges to students, and all other income of the institution should be defined as restricted income, as income received for specified purposes and leading to specified expenditures.

I recognize that this recommendation does not accord with the concepts and the exhibits of either the audit guide of the AICPA or the financial accounting and reporting manual of NACUBO. But it appears to me that both of these documents were prepared from the point of view of private and public institutions and not from the point of view of the relationship of state universities to state government. Necessarily state governments have a particular point of view insofar as the appropriations to state institutions of higher education are concerned. The point of view of state government is how much of the total needed operating income of a state university and of a state college shall be provided from state tax revenues. And there is the further issue of the extent to which state governments find it desirable and necessary to place restrictions upon the use of the state subsidies provided to state institutions of higher education.

Because expenditure categories and income categories are closely related in the operations and management of a university or college, it is important to have an understanding of the variety of income available to institutions of higher education before proceeding with a discussion of programs and their income needs. The next section of this discussion provides a review of these varied income sources and their varied purposes. State governments necessarily have to thread their way through this income maze.

3 Income

In its financial accounting and reporting manual the National Association of College and University Business Officers recommends a standard chart of accounts for current funds revenues accounts. The principal headings in this chart of accounts are shown on Chart 2. In several instances, the chart of accounts suggests that there be added such details "as needed." It is not clear exactly whose need is thus to be accommodated: the need of a governing board or the need of a state government. It seems to me that insofar as state institutions of higher education are concerned, both needs are valid and both needs must be recognized. In the discussion which follows the needs of state government are once again our primary concern.

As mentioned in the preceding section, recommended practice proposes that the various revenue accounts should be divided into a restricted and an unrestricted category. This division is just as important, indeed more important, for the revenue accounts of state institutions of higher education as it is for expenditure accounts. The reasons have already been given. Just as I have suggested that only expenditures from student instructional charges and from the general state subsidy should be defined as unrestricted expenditures, so I would recommend that only these two sources of income be treated as unrestricted income. State universities and colleges may of course receive gifts and may have endowment income whose terms specify only that the income be used for the betterment or for any general purpose of the institution. These are valuable and helpful kinds of income to have. But from the point of view of state government, this kind of income should still be considered as restricted revenue. This kind of income is income solely for the use of a particular governing board or for the use of a particular institution. Such revenue is not subject to determination of its amount by state government.

Here it may be useful to mention again the two major objectives set for a state appropriation system in support of higher education: equity in the distribution of the total appropriation and adequacy in the combination of appropriation and student instructional charges. These objectives, I submit, are to be achieved in the process of determining state government appropriations and in fixing student instructional charges. As mentioned earlier, one of the criticisms made of budget formula procedures is that they establish a "common leveling" of state institutions of higher education. It is said that these procedures fail to encourage or to recognize differences among institutions. Personally I believe this criticism is often exaggerated, but certainly one way to avoid this criticism is to define all "outside" sources of income as restricted.

In its recommended current funds revenue accounts the NACUBO manual does not recognize any major categories of program activity such as are specified for the current funds expenditures and transfer accounts. There is no major category of revenues labelled "educational and general revenue." All revenues are treated as if they constitute one great pool for distribution by a governing board. The appearance of this single pool concept is contradicted, however, by the various categories of income derived from sales

CHART 2

CURRENT FUNDS REVENUES ACCOUNTS

Tuition and Fees

Federal Appropriations

State Appropriations

Local Appropriations

Federal Grants and Contracts

Local Grants and Contracts

Private Gifts, Grants, and Contracts

Endowment Income

Sales and Services of Educational Activities

Sales and Services of Auxiliary Enterprises

Sales and Services of Hospitals

Other Sources

Independent Operations

and services, and by a separate revenue account for independent operations. The fact is that revenues are not a single pool of income; most revenues of a state university, and especially of a state research university, are restricted revenues which may be used to meet only specified program expenditures.

In this section it will be necessary to look, at least briefly, at each one of the major categories of revenue as these are presented in the NACUBO manual. In many instances it will be useful to add details "as needed."

Tuition and Fees

As we have noticed earlier, state institutions of higher education fix several kinds of charges to students: instructional charges, student service charges, and facility charges. In addition, most state institutions of higher education make a differential in their instructional charges between a resident of a particular state and a non-resident of the state. State government officials have looked with some disapproval upon any sizeable influx of out-of-state students to one or more of the state institutions of higher education located in their particular state. These state officials have feared that such an influx of out-of-state students might represent a concerted effort of citizens in another state to avoid the public support of higher education and thus become a substantial additional tax burden upon the citizens of their own state. A higher instructional charge to the out-of-state student is regarded as an economic barrier to the inter-state movement of students and consequently to a shift of tax burdens among state governments.

The whole constitutional question of differential instructional charges based upon student residence need not be considered here. In general, the differential charge based upon student residence has been held to be a constitutionally permitted practice. But courts have held unconstitutional any law or rule which tended to deny the possibility that a student might acquire legal residence after an "appropriate" period of time. The matters of defining the appropriate period of time and the appropriate circumstances constituting legal residence remain to be resolved. In any event, it seems likely that the number of students in some state universities defined as out-of-state students will tend to decline.

State governments may impose upon governing boards, or state governments may recommend to governing boards, a restriction or a quota upon the admission of out-of-state students. A limitation of 20 percent in an entering freshman class is not unusual. The constitutionality of this practice is still to be tested. In at least one instance, a state legislature has eliminated any instructional subsidy for undergraduate out-of-state students. This action then compels a governing board to fix an out-of-state instructional charge equal to the cost of the instructional service rendered. This is another means of bringing about a restriction upon out-of-state enrollment.

Another kind of differential instructional charge which is beginning to appear within a number of states is a differential charge by level of instruction. In at least one state one charge is made to students in their first and second year, a somewhat higher charge is made to students in their third and fourth year, and a still higher charge is made to students after the fourth year for graduate and graduate professional study. In another state there is a differential instructional charge to undergraduate students, to graduate and professional students, and to students in the colleges of medicine. There are reasons

of educational philosophy and of economics that have led to these practices. Where the practice does occur, or is being considered, there is a need for information about the revenues thus realized.

It seems to me that many state governments as a minimum will wish to specify that student tuition and other fees be reported under the following categories:

01.0 Tuition and Fees

- 01.1 Undergraduate Instruction
  - 01.11 State Resident
  - 01.12 Out-of-State Resident
- 01.2 Graduate and Graduate Professional Instruction
  - 01.21 State Resident
  - 01.22 Out-of-State Resident
- 01.3 Student Services Fee
- 01.4 Facility Fee
- 01.5 Miscellaneous Fees

There is one other matter which needs comment here. Some institutions of higher education have adopted the practice of "waiving" one or more of these fee charges for certain students. Personally, I think the "waiver" practice is undesirable and should be abolished in all institutions of higher education. A waiver of fees is in fact a form of student financial assistance, should be administered as such, and should be reported as such. Thus a student may receive a "warrant" which is a partial or full payment of certain specified fees. The warrant then becomes tuition or fee income on the one hand and an expenditure for student financial assistance on the other hand.

But where the "warrant" practice in preference to the "waiver" practice has not been instituted in a state university or state college, then it is important that the wiaver practice not result in a reduction of the stated tuition and fee revenue but be accounted for as both revenue and expenditure. Any other practice conceals the true state of both the revenue and the expenditure budgeting and reporting of a state institution of higher education.

Federal Appropriations

The second category of revenue in the NACUBO chart of accounts is that of federal appropriations. This category is obviously distinct from another, subsequent category: federal grants and contracts. Only a very few state institutions of higher education would have any income under this particular category; these would be the institutions designated as land-grant institutions under the federal Morrill Act of 1862 and so eligible for general appropriation support under the second Morrill Act of 1890, as amended. This relatively small annual appropriation is to be used by the governing boards of Morrill Act land-grant institutions for the general purposes (agriculture and the mechanic arts) of the initial federal legislation.

There are certain other institutions receiving federal appropriations: the military academies, the regionally accredited military schools, colleges in the District of Colum-

bia, Howard University in the District of Columbia, and two private universities in the District of Columbia receiving financial assistance for their medical schools and teaching hospitals. None of these is a state government institution of higher education.

State Appropriations

A major source of revenue for a state institution of higher education is a state appropriation. This appropriation may be in several parts. As a consequence it is desirable that the various components of the state appropriation should be clearly indicated.

The most important part or component of the state appropriation support for state institutions of higher education is the general appropriation for performance of the general educational purposes of an institution. In terms of the discussion to follow in succeeding sections of this paper, the general appropriation provides revenue to be used to help meet the expenses for instruction, academic support, student services, institutional support, and the operation and maintenance of plant. We shall consider each of these functional or program components of the state general appropriation in due course. It is necessary here to understand that the state government's general appropriation is provided in support of these particular programs of a state institution of higher education.

The state government general appropriation may be provided as a lump sum subsidy of the operations of a state university or state college or it may be provided on a line-item basis. I think there are very important reasons why this general appropriation should be made as a single lump sum subsidy. As I have said before, the appropriation in some instances will be no more than one-third of the total income of a state institution of higher education. In almost all instances state governments will expect and should encourage the acquisition of revenue from other sources: if not from charges to students then in the form of gifts, grants, and sales. To isolate the state government-provided income from all other income in terms of the compensation of particular persons to be paid and particular other costs to be met is to demand an artificial and arbitrary division of planned expenditures and substantially to increase the management and accounting expenses of the individual institutions. In the name of a misunderstood concept of accountability there is no reason for state governments to demand that state institutions of higher education maintain extensive accounting details and so incur an expensive cost of operation.

In these comments I do not mean to imply that state universities and state colleges should not plan and budget the operations of these various program categories enumerated above with great care and precision. As the later discussion will indicate, program budgets must be prepared in substantial detail by state institutions of higher education: detail about program outputs, detail about program technology, detail about objects of expenditure. When the program details have been reviewed by state agencies and officials, the single question then is how much of the income to meet approved programs shall be provided by the general state government subsidy. The total general state subsidy then becomes the total of the state support to be provided for these program categories: instruction, academic support, student services, institutional support, and operation and maintenance of the plant.

If state agencies, state governors, and state legislators are fearful about delegating such extensive financial discretion to governing boards of state institutions of higher

education as the single lump sum appropriation provides, then state appropriations ought to be made, I think, in terms of the program categories just mentioned. To make the appropriation in terms of line-items of specified objects of expenditure is to perpetuate a discredited and outmoded appropriation practice.

In addition to the state general appropriation, there may be state government appropriations to state institutions for other program purposes: research, public service, student financial assistance, and hospital operations. These appropriations should be separately indicated, since they may not be applicable to all state institutions of higher education and since they may not be provided by all state governments.

There is also one special purpose state appropriation which requires special mention. State governments during the 1960's resorted to varied means for financing the expansion of capital plant required to meet a three-fold enrollment growth in state institutions of higher education. In some instances state governments authorized the device of the revenue bond as a means of financing this plant expansion. There were several good and sufficient reasons for this practice. But if the revenue bond was utilized for academic plant financing, then the state institution of higher education had to have some revenue to pledge for the debt service of these bonds. The customary revenue source utilized for such pledging was a student facility fee.

Some state governments than undertook to replace the expense to the institution in the dedication of this fee by a "replacement" appropriation. What state governments did in effect was to say to a governing board, "You may earmark a part of your charge to students as a facility fee, and you may borrow on revenue bonds to build needed instructional and support plant by a pledge of this facility fee." From the point of view of a governing board, this was a desirable arrangement, except that it reduced the student fee revenue available to support current operations. The response of state government was to appropriate annually or biennially a replacement for the facility fee. For constitutional reasons state governments could not pledge state appropriations for the debt service of revenue bonds but there was no constitutional prohibition against appropriations to replace the loss of current operating revenue by the institutional pledging of a facilities fee.

Accordingly, at a minimum the budgeting and reporting of state appropriations in support of state institutions of higher education should be detailed as follows:

03 State Appropriations

- 03 1 State General Subsidy
- 03 2 Agricultural Experiment Station
- 03 3 Other Research
- 03 4 Agricultural Extension Service
- 03 5 Other Public Service
- 03 6 Subsidy of Teaching Hospital
- 03 7 Fee Replacement

Local Appropriations

For state sponsored and supported institutions of higher education a revenue category labelled "local appropriation" will have no relevance. This particular category has been included in the NACUBO chart of accounts for the use of two-year colleges sponsored

and supported by local units of government in the United States, plus the handful of colleges and universities still sponsored and supported by city governments in this country. In all of these instances state governments usually provide financial assistance to the local sponsoring district or directly to the locally sponsored institution of higher education. Thus, locally sponsored and supported colleges or universities will also receive some state government support as well.

The state appropriation support to locally sponsored institutions is usually based upon some kind of formula which operates separately and apart from state appropriation support to the states institutions of higher education. There are several possible kinds of formula that may be employed in these circumstances. A popular formula for the current operating support of two-year colleges has been that of one-third local taxation support, one-third state taxation support, and one-third student fee support. In one state the formula has been to provide two-year colleges with the same support for lower division and technical students as is provided to the state institutions. Local tax support is then utilized to reduce the level of charges to students. Various other approaches to state financial assistance have been developed in various states.

State governments generally have found that when state laws have permitted local units of governments (city governments, county governments, or school districts) to establish locally sponsored institutions of higher education, then state governments will have to provide some kind of financial assistance to these institutions. Usually a separate budget and appropriation process has been developed in these situations. The need for a separate process can be avoided when all institutions of higher education are sponsored and supported only by state governments, as is the case in Indiana and several other states.

Federal Grants and Contracts

Federal government financial assistance to colleges and universities is extended primarily through grants and contracts. For the most part, these grants and contracts have been for two purposes: research and student financial assistance. In some instances so-called training grants and fellowship grants have been accompanied by a "cost of instruction' allowance. Thus this kind of grant is intended first of all to provide a stipend or personal allowance to a student in an advanced field of learning such as the biological sciences or nuclear physics or space engineering or a foreign language. The stipend or personal allowance meets the personal and family costs of a student enrolled for study. The "cost of instruction" allowance may pay the tuition charge for the student and even defray a part of the instructional subsidy involved in the education of the student. Only in a few kinds of special circumstances has the federal government made general institutional grants.

In their research grants and contracts federal government agencies usually undertake to meet various specified "direct" costs such as compensation of research personnel, supplies and equipment, and other expenses. In addition, the federal agencies provide an amount for "indirect" or overhead costs The amount, calculated according to various formulas, is intended to compensate the institution for the expense of operation and maintenance of the plant and for a fair share of the academic support, institutional support, and student services costs which may arise as a result of the research grant.

At a minimum it seems essential that the following details should be available in connection with general grants and contracts revenues provided to a state institution of higher education by federal government agencies:

05 Federal Grants and Contracts

- 05.1 Research Grants and Contracts
- 05.2 Agricultural Research
- 05.3 Agricultural Extension
- 05.4 Other Public Service
- 05.5 Student Financial Assistance
- 05.6 General Grants
- 05.7 Overhead Cost Reimbursement

State Grants and Contracts

In a few instances state governments may enter into contracts with or make grants to state institutions of higher education for specified services, usually of a research or public service nature. The practice is not extensive and large amounts of money are not usually involved. Moreover, state agencies generally do not reimburse state institutions of higher education for any overhead costs, on the grounds that these costs have already been provided by appropriations of state government support.

Because income from state grants and contracts is usually on a small scale, no particular detail about the program purpose of the grants is necessary. If a state government so desires, it may ask for a broad breakdown of income as follows:

06 State Grants and Contracts

- 06.1 Research
- 06.2 Public Service

Local Grants and Contracts

The same comments which are applicable to state government grants and contracts may also be made about revenue from local government grants and contracts. The extent of such revenue is likely to be quite small.

Private Gifts, Grants, and Contracts

Many state institutions of higher education will have some income each year received from private sources: private foundations, private business corporations, voluntary associations, and individuals. The dollar volume of such gifts and grants may be relatively modest in relation to total operating revenues, but these are sources of income which actually or potentially are of substantial importance.

It may be desirable to obtain additional detail about these revenues in terms of source (foundations, corporations, etc.), or in terms of purpose (research, public service, student aid, and other). Such detail may be desirable from the point of view of a governing board. Such detail may not be of special interest to state governments.

Endowment Income

Many state universities and state colleges receive some endowment income from endowment bequests or from land grants made at various times. In a few leading state universities such endowment income may be fairly sizeable. Again the immediate question here is whether or not state governments have any real need for additional detail beyond knowledge of the revenue category itself. Detail might be provided about source (endowment capital, endowment held by other trustees, land-grant) or about purpose (general, research, public service, student aid, capital plant).

It would seem that state governments are properly concerned to know the total amount of such revenue but need not be concerned about any further detail.

Sales and Services of Educational Activities

The educational programs of state institutions may operate various supplementary or academic support activities which result in the sale of products and services. The revenue derived from these activities is properly budgeted and reported under this category of income.

In a state university with a college of agriculture there will necessarily be a demonstration or laboratory farm as an adjunct facility for instruction, observation, and experience. If the farm includes a dairy herd, then some kind of milk operation and sale will be necessary. There may be crops to sell and livestock and poultry to sell as well. A laboratory farm will produce revenue.

In a state university with a college of education there may be a laboratory or demonstration elementary-secondary school as an adjunct facility to the educational program. Here again the school may be used for purposes of observation and experience for the students of teacher education. In those instances where elementary-secondary schools are operated, an instructional charge is usually made to the parents of the children who are enrolled. This charge becomes a sale, producing revenue to help meet the expense of operating such a school.

In a state university with an audio-visual service providing films, film strips, charts, and other materials for instructional purposes, the service may rent some materials to elementary and secondary schools in the vicinity, to other colleges in the area, and to civic or other groups. These rentals to agencies *outside* the state university itself become revenue for the institution.

There are many other kinds of services which state universities and state colleges may render and for which charges may be made: veterinary clinics, speech and hearing clinics, reading clinics, home economics demonstrations, psychological and skill testing, etc. These charges produce sales revenues.

The important issue here again is the extent to which certain details about these sales and services may be desired by state governments. It seems likely that to the extent that certain academic support programs are detailed as separate expense programs, then data may be desired about the offsetting revenue produced by these same academic support programs.

For example, the following detail may be appropriate for this category of revenue:

10 Sales and Services of Educational Activities

- 10.1 Demonstration Schools
- 10.2 Clinics (other than health)
- 10.3 Veterinary Clinics
- 10.4 Demonstration Farms
- 10.5 Instructional Materials
- 10.6 Museums and Galleries
- 10.7 Other

Sales and Services of Auxiliary Enterprises

As mentioned earlier, the prevailing policy in state institutions of higher education is to expect all auxiliary enterprises to be self-supporting, so that revenues are sufficient to meet all current operating expenses, including debt service for any physical plant facilities utilized by these enterprises. The revenue for these auxiliary enterprises is derived primarily from charges for service, although in some state universities and colleges a student services fee is a supplementary source of income.

From the point of view of state government the important issue is simply whether or not auxiliary enterprises are in fact self-supporting. This question can be answered by budget and reporting data which show income equal to or in excess of expenditures. If these enterprises are operating at a deficit, this is a situation which governing boards have the authority and responsibility to rectify. The interest of state government is one of making certain that governing boards do in fact exercise their authority and responsibility in accordance with approved state policy.

To what extent then is it desirable at the state government level to have information about budgets, expenditures, and revenues of auxiliary enterprises in any particular detail? For internal management purposes obviously a governing board must have information in considerable detail. A state government does not need the same kind of detail. If a state government is disposed to believe that some detail is desirable, the following would seem to be sufficient:

11 Sales and Services of Auxiliary Enterprises

- 11.1 Residence Halls
- 11.2 Food Service
- 11.3 Student Health Service
- 11.4 Student Recreation Service
- 11.5 Book Store
- 11.6 University Center
- 11.7 Intercollegiate Athletics
- 11.8 Other Enterprises

The same detail should then be provided about expenditures, plus the item of transfers to debt service reserve and equipment reserve.

Sales and Services of Hospitals

In those instances where a state university or a state medical college owns and operates a teaching hospital, a category of revenue related to this activity is necessary. especially when state governments will be expected to subsidize the difference between revenue generated by the activity and total operating expense. Because of their involvement in this activity, state governments will necessarily want some appropriate information about details of the income thus collected.

In general, some four categories of income should be sufficient for state government purposes:

12 Sales and Services of Hospitals

- 12.1 Hospital Medical Service
- 12.2 Hospital Patient Service
- 12.3 Outpatient Medical Service
- 12.4 Other Professional Services

Other Sources

A state university or state college may have miscellaneous sources of income: interest income from short-term investments, certain fees or charges for use of facilities, and other income. Under most circumstances where the revenue thus obtained is relatively modest in volume, there is very little reason to provide any details about the particular sources of this income. Undoubtedly, governing boards will wish to have such detail but there is not need for state governments to examine this revenue item in similar detail.

Independent Operations

Finally, in those situations where a state university has undertaken under contract to manage a research or service facility and activity for a federal government agency or for a state government agency, then the contractual income obtained for this management would be reported as a separate category of revenue. Presumably the same detail—the identification of each such contract operation—would appear both as a source of revenue and as a program of expenditure. Here the issue for state government is to know whether or not income under the contract is equal to the expenditures.

General

It is important that state institutions of higher education budget their revenues and their expenditures in comprehensive scope, so that a complete record of institutional operations is available for the information of state boards of higher education, state budget offices, governors, and legislators. The program of expenditures cannot be reviewed except in terms of the income expected or needed in order to meet the

recommended level of expenditures. The statement of revenues must be such that it is clearly related also to the statement of expenditures.

It is desirable to repeat here that both revenues and expenditures in the chart of accounts and the model institutional statements as recommended by NACUBO call for separate unrestricted and restricted components. As I have suggested earlier, I believe all categories of revenue received by state institutions of higher education should be considered as restricted revenue except the state government general subsidy for educational operations and the charges collected from students for instructional service. It is these two items of revenue which constitute the balancing income for state institutions with which to meet their projected programs of operation.

4 Primary Programs: Instruction and Other

The category of expenditure labelled instruction is the most important single category of concern to state governments in the appropriation process, and also the most complicated to analyze. Instructional expenditures are the sum total of all the costs attributed to the instructional departments of a state university or of a state college. The cost centers, in other words, for the instruction expenditures are the academic departments and such other centers or interdisciplinary units as may offer instruction to students for the award of one or more degrees.

In addition to the complication of a variety of levels of instruction which may be offered by an academic department—lower division, upper division, graduate I, and graduate II—academic departments often have other outputs they undertake to produce besides the instruction of students. These other products involve research, public service, and the critical evaluation of social performance. To be sure, in a state university there will be some separately budgeted research and some separately budgeted public service. At times some part of a faculty member's compensation may be assigned to a research project or to a public service project. But faculty members not engaged in the performance of a separately budgeted research project or of a separately budgeted public service project may still be devoting some part of their time to one or both kinds of activity. The instruction of students is not the only output of faculty members, even when the expenditure category of instruction is the source of the full-time financial support of faculty members.

The National Center for Educational Statistics of the Office of Education in the U.S. Department of Health, Education, and Welfare, in connection with its Higher Education General Information Service (HEGIS), has developed a taxonomy of instructional programs as offered by institutions of higher education. Enrollment data and data about degrees awarded are supposed to be reported in accordance with these categories.

The National Center for Higher Education Management Systems has further developed a program classification structure applicable not only to instruction but to all other activities of an institution of higher education. In connection with the program activities labelled "instruction," the NCHEMS classification makes use of the HEGIS taxonomy.

In the NCHEMS program classification structure the category of instruction is divided into four subprograms, as follows:

1 1 General Academic Instruction
1 2 Occupational and Vocational Instruction
1 3 Special Session Instruction
1 4 Extension Instruction (not for credit)

Within the subprogram of general academic instruction a considerable array of program "categories" are provided from the HEGIS taxonomy, with additional detail at the program subcategory (departments), the program sector (levels of instruction), and

the program element (the individual course). This is a very substantial amount of detail which it is essential for the management of a particular institution of higher education to master but detail which can only be so overwhelming as to be valueless for state government agencies.

It seems to me that the most satisfactory procedure to be followed by a state board of higher education and by other state government agencies is to seek data about instructional expenditures in a comprehensive, relatively simplified form. This can be accomplished primarily, I believe, by use of the program "categories" in the NCHEMS program classification structure. Such a program classification is set forth in Chart 3. It is important to move to the program subcategory only in connection with the category "health professions." These subprograms are so expensive that they must be mentioned separately; moreover some state institutions of higher education will offer some subcategories (such as nursing) and not others (such as medicine or dentistry). With this one exception, the program concerns of state government can properly be handled, I believe, by use of the categories set forth here.

Program Expenditures

If the suggested program classification structure for instructional programs is utilized by state governments as suggested here, then each state sponsored and supported institution of higher education would have a maximum of 38 programs about which to report financial data and budget data. In practice, it seems quite unlikely that any one institution would be likely to offer all 38 of these programs. On a state-wide basis, including whatever structural arrangement exists for the management and supervision of vocational-technical education, all 38 programs would surely appear.

For the individual university or college, the preparation of expenditure data and budget data by each of these instructional programs should be a relatively simple procedure. What is involved is simply the assignment of every single instructional cost center—that is, every academic department and other instructional unit—to one of these 38 programs. Departmental budgets are the very heart of academic budgeting by institutions of higher education, and all that is necessary in this procedure as suggested here is just to aggregate these departmental budgets under 38 program categories.

Perhaps a word should be inserted here about the importance for state governments in having financial data by these 38 program categories. If the objectives of equity and of adequacy are to be realized in the state government appropriation process, expenditure needs and appropriated revenues must be based upon program offerings of the various state institutions of higher education. Instructional outputs cannot be compared upon an over-all institutional basis; what counts for comparison purposes are the costs arising from the offering of comparable programs of instruction.

It is clear that instructional program costs will vary from one program to another. In large part the costs will vary according to the technology of instruction employed; extensive laboratory instruction in the physical sciences and the biological sciences will be more expensive than the non-laboratory instruction in letters, foreign language, mathematics, and the social sciences. Highly individualized instruction in the fine and applied arts will cost more than the more generalized instruction in business management and education. A student-teacher ratio of four medical students to one full-time

medical faculty member is much more costly than a student-faculty ratio of 25 law students to one full-time law faculty member.

Departmental budgets will ordinarily consist of four major components: faculty compensation, support compensation, supplies and expenses, and equipment. There is one other item of expense which really deserves to be considered in connection with each instructional department: student financial assistance for students majoring in the department or pursuing an advanced degree in the department. Since there is a separate program category for student aid, and since the revenue sources for student aid require some central management within each state institution, this cost element will be discussed later. There is one part of the departmental budget, however, which is related to student aid and which must be considered here: the employment of teaching assistants.

In my view the decision of a department, a college, or a university to offer some part of its instructional activity through the employment of part-time teaching assistants is perfectly legitimate. Important as is this practice in recruiting and retaining graduate students, the practice must be justified in the first instance as an instructional procedure, and the number of part-time teaching assistants authorized for each department must be a part of the faculty compensation budget.

Departmental costs will vary among departments because of differences in the distribution of faculty by rank (teaching assistants, instructors, assistant professors, associate professors, professors, adjunct faculty), by the average compensation by rank, and by the non-faculty costs. These differences will reflect differences in departmental experience and cannot be avoided. There is no need for state governments to try to equalize departmental expenditures. The utilization of instructional income is a task of institutional management and of governing boards.

Just as there is no single standard for departmental costs within a state university or state college, there is no common pattern in the distribution of the objects of expenditure. Within a departmental budget, an average distribution of expenditures will be somewhat as follows:

	Percent
faculty compensation	70
other compensation	17
supplies and expenses	10
contracted services	1
equipment	2

There may be substantial variations around any such averages. Under conditions of financial stringency state universities tend to squeeze first the non-faculty compensation part of a departmental budget. Many budget analysts for universities would consider a 65-35 relationship between faculty compensation and the total departmental budget as a standard toward which to strive.

Levels of Instruction

A departmental budget, especially a departmental budget in one of the academic disciplines, may provide for the instruction of students at several different levels. As indicated earlier, four levels of instructional activity are usually recognized in an academic

CHART 3

PROGRAM CLASSIFICATION STRUCTURE FOR INSTRUCTION

1.1 *General Academic Instruction*

1.1.0100		Agriculture and Natural Resources
0200		Architecture and Environmental Design
0300		Area Studies
0400		Biological Sciences
0500		Business and Management
0600		Communications
0700		Computer and Information Sciences
0800		Education
0900		Engineering
1000		Fine and Applied Arts
1100		Foreign Languages
1200		Health Professions
	1202	Hospital & Health Care Administration
	1203	Nursing
	1204	Dentistry
	1206	Medicine
	1211	Pharmacy
	1218	Veterinary Medicine
	1223	Medical Laboratory Technologies
	1201	General and Other
1300		Home Economics
1400		Law
1500		Letters

1.1 *General Academic Instruction* (Cont'd.)

1600	Library Science
1700	Mathematics
1800	Military Science
1900	Physical Sciences
2000	Psychology
2100	Public Affairs and Services
2200	Social Sciences
2300	Theology
4900	Interdisciplinary Studies

1.2 *Occupational and Vocational Instruction*

1.2.5000	Business and Commerce Technologies
5100	Data Processing Technologies
5200	Health Service Technologies
5300	Mechanical and Engineering Technologies
5400	Natural Science Technologies
5500	Public Service Technologies

discipline: lower division, upper division, graduate I, and graduate II. These levels may be applicable also in certain professional fields of study, such as agriculture, education, engineering, home economics, and nursing. These and other professional fields are likely to argue, however, that there is only one level of instruction for the undergraduate student. a baccalaureate professional level of instruction, and then recognize two levels of instruction for the graduate student. Even in the academic disciplines, there is a tendency at present for departments to make very few if any distinctions between courses offered for freshmen and sophomores and courses offered for juniors and seniors. The reason for attempting a distinction is the desire to provide financial support to community colleges comparable to that for senior institutions.

There are cost differentials between levels of instruction in academic departments because of several factors. Some courses (introductory courses) tend to have large enrollments and sc the cost per student is less. Courses with small enrollments will usually have higher costs. Courses taught by a professor will cost more usually than courses taught by a teaching assistant. Courses taught by a faculty member who is giving substantial time to research or public service will cost more usually than courses taught by a faculty member giving most of his or her time to instruction. These cost differences are well known to department chairmen and to deans. But these cost differences are very difficult to analyze and present in any simple, meaningful format.

The usual means for arriving at cost differences is not a course by course analysis of actual costs, although this procedure is possible. The usual means is to ask faculty members to provide a report of the distribution of their time between lower division, upper division, graduate I, and graduate II levels of instruction. Time devoted to research and public service will then ordinarily appear as part of the costs of upper division and graduate instruction. Upon the basis of this faculty report, faculty compensation and other costs of a department are then distributed and cost data by level of instruction determined. I can only say upon the basis of experience and observation that this procedure is at best an unsatisfactory method of analysis and of cost determination.

What is a satisfactory procedure for cost determination within an academic department? Should expenditure budgets make provision for variations in costs by levels of instruction? These are vital questions, but before we attempt their answer there is still another factor to be discussed.

Measurement of Output

Expenditures by departments and by the program categories listed above tell us very little, without work load, about the output achieved from the expenditures. Unfortunately, there is no useful output unit which can be quantified and employed as an indication of instructional work load except student credit hours or student course credits. There is another possible unit, degrees awarded. This item of degrees awarded is useful in providing some data about output, but enrollment in terms of credit hours or course credits is more satisfactory. Students make progress toward a degree at different rates of accomplishment or at a different pace. Some students are part-time students and therefore take longer to complete degree requirements; for a variety of reasons some students may enroll for a while and then interrupt their studies before they complete a degree program. The accurate measurement of instructional work load and of output is

therefore some unit which indicates current student enrollment as of one academic year, and that unit is the course credit unit.

Course credit hours can be readily translated into a full-time equivalent student unit if that is desired. The advantage in the full-time equivalent student unit is that it provides a smaller and more manageable unit. The preferable method for calculating this FTE unit in my judgment is to accumulate all credit hours of enrollment in all undergraduate courses of instruction by departments as of October 1 or October 15, and then to divide this number by 15. The quotient of the division is the full-time equivalent undergraduate students enrolled in courses department by department. Moreover, this number represents the work load and output of undergraduate instruction for the full academic year of two semesters or three quarters.

Some state governments and some institutions of higher education prefer to obtain an average FTE figure for two semesters or three quarters rather than a one-time figure at the beginning of a regular academic year. I would argue that the practice I have outlined in the preceding paragraph is preferable to the practice of averaging. An academic department must ordinarily make its staffing arrangements for a nine-month period and for the work load of the first quarter or semester. An institution in a large urban area may be able to find qualified personnel on a part-time basis to instruct for a quarter or semester. But other institutions may not be so situated.

There is the further matter of how to count enrollment for summer session or summer quarter. In the instance of a quarter calender the enumeration is a simple one: the total of student credit hours divided by 45 provides a full-time equivalent student count which is equal on an annual basis to that of the autumn count. The autumn count and the summer count added together then provide a full-year count. If the course credits of a summer session have a semester value, then these credit hours divided by 30 and added to the autumn count will indicate a full-year count. There is another possibility of handling the summer session as a special session expense, as will be mentioned below. Personally, I do not recommend this practice.

The same procedure may be employed for graduate and graduate professional enrollments. It is relatively easy to draw a distinction between undergraduate and graduate or graduate professional enrollments. If the distinction cannot be made on the basis of the courses themselves, it can be made on the basis of the status of the student. If a student has not yet received a bachelor's degree and is enrolled in a baccalaureate curriculum, then that student is an undergraduate student and his or her student credit hours constitute undergraduate enrollment. If a student has received a bachelor's degree and is enrolled in an advanced degree curriculum, then the student is either a graduate or a graduate professional student and the course enrollments are so counted.

For an academic department and for a professional department in such fields as architecture, fine and applied arts, business management, education, nursing, and others, it is very important to have output units—that is, full-time equivalent student enrollments—divided between undergraduate and graduate status. The next question is whether or not to have enrollment data in further detail: by lower division, upper division, graduate I, and graduate II. If the budget formula utilized by a state government is based upon four levels of instruction insofar as costs are concerned, then enrollment data must also be collected on a four-level basis. If the enrollment formula uses two rather than four levels, then enrollment data on this same basis are sufficient.

Enrollment output is the cost factor of first importance in attempting to devise a budget formula for instruction. It is the only basis of comparison between the same program categories as offered by different state institutions of higher education. It may be useful and certainly informative to have information about degrees awarded according to the HEGIS classification. Cost per degree awarded may be one kind of expenditure comparison which can lead to further analysis of program costs and cost benefits. Nonetheless, costs per credit hour or per full-time equivalent student are the basic data for budget preparation and appropriations for public institutions of higher education insofar as the instructional programs are concerned.

There remains the question whether or not enrollment output is the appropriate unit of measurement for quantifying the instruction programs of colleges and universities. We have commented earlier that faculty members engaged in the instructional function do produce outputs other than student instruction. Apart from all the corollary aspects of classroom and laboratory instruction—class preparation, individual student advising, individual student evaluation, participation in departmental and college decision-making about academic affairs, and continued personal and professional development—faculty members may also conduct research projects and public service projects which are not funded separately from the instruction program. Unfortunately, there is no standard unit of measurement for these outputs. Academic departments generally maintain an annual bibliography of articles and other materials published under the authorship of faculty members, and generally record consulting and other services rendered by faculty members. These evidences of activity related to the instructional program can be evaluated by academic peers of a faculty member, but any simple enumeration fails to provide some indication of the importance or quality of an individual's activity. It is usually acknowledged that a faculty member's research and public service output can be evaluated but cannot be measured in any fair and satisfactory manner. A budget formula for instruction in its cost and work load standards may provide some support, however, for faculty research and public service.

Output and Costs

It must be recognized that the purpose of measuring the instructional outputs of a department as discussed in this context has but one basic aim: to arrive at cost data per unit of output. These costs provide the basic information for arriving at estimates of future costs and future appropriation needs. For the various programs of instruction, as we have said, current cost data are readily available and current output data in terms of student credit hours produced are readily available. The question then is how these data are to be utilized for purposes of budgeting and of determining state appropriations.

Ordinarily departmental costs are aggregated by total regardless of the levels of instruction provided. Some departments may be involved in four levels of instruction, others perhaps in only one or two levels of instruction. As we have noted earlier, there are important differences in costs which may arise from different levels of instruction. The essential differences arise from four major factors: class size, faculty workload, faculty compensation, and equipment and supplies consumed by the student. Without reviewing the cost aspects of these various factors in any detail, certain generalizations about cost behavior should be repeated here. Lower division classes are frequently instructed in fair-

ly sizeable groups ranging from 25 or 30 to perhaps as many as 300 students or even more. Upper division classes are often highly specialized, numerous, and quite demanding in student performance; these classes are usually instructed in relatively small numbers, from 8 or 10 to 16 or 20 students. Graduate I courses may enroll approximately the same number of students as upper division courses but usually require extensive reading or laboratory work. Graduate II courses usually involve research and other instruction on a tutorial basis. The larger the number of students enrolled in a course, the lower will be the cost per credit hour or per student.

Faculty work load may be expressed in terms of a student-faculty ratio or in terms of total student credit hours of instruction provided. Faculty work load tends to be higher at the lower division level, and much less at the graduate II level because of the tutorial method of instruction and because of the faculty time given to research. Faculty compensation tends to be less for those persons who teach lower division courses because the number of persons qualified for such instruction is usually fairly sizeable. Faculty compensation tends to be higher for those persons who teach at the graduate II level because the number of research scholars of high reputation is limited and the competition for their services fairly intensive. Insofar as supplies and equipment are concerned (including library materials), the consumption by lower division students is fairly low and the consumption by graduate II students is quite high.

There are differences in cost among graduate professional programs (such as law, dentistry, optometry, veterinary medicine, and medicine) which reflect the same kinds of differences in class size, in faculty work load, in faculty compensation, and in the consumption of supplies and equipment. The problem of cost determination is somewhat less difficult (except in medicine) simply because there is only one level or one degree program of instruction involved.

The problem for the budget analyst is how to determine just what these cost differences are by levels of instruction by major program areas: e.g., the biological sciences. There are essentially two possible methods of procedure. One is to develop a cost analysis procedure by fields of study and by levels of study. Such a cost analysis procedure has been provided for colleges and universities and for state governments by the National Center for Higher Education Management Systems. Other cost analysis procedures have been developed by some state boards of education and by several consulting organizations. A second procedure is simply to determine cost differentials by fields and levels of study on a sampling basis and then to let the data thus determined become the model for all departments in the same general area. Not a great deal has been done to utilize sampling techniques of cost analysis, but there is no reason to believe that sampling techniques may not be useful and may not be much less costly than comprehensive analysis.

There remains again the matter of how many levels of study to undertake in a cost analysis procedure. There are certain obvious complications in answering this question. I can see certain definite advantages in having one cost standard for a two-year campus and another cost standard for all undergraduate instruction for the baccalaureate degree. But there are disadvantages to this procedure as well; such as an encouragement for two-year campuses to move to four-year programs because of the increased income thus provided. I can see an advantage in having a single cost standard for graduate instruction. This practice might discourage the faculty inclination to offer doctoral degree

programs and emphasize the need to obtain other financial resources if quality doctoral degree programs are to be offered. Under current circumstances I am convinced that in most if not all state governments at least four levels of cost analysis are necessary.

The Budget Formula

There are essentially four generalized procedures for developing a formula to express the expenditure need involved in offering various instructional programs. All of these formulas are based upon the measurement of credit hour or full-time equivalent enrollment as the output of the instructional activity. In this way, the formulas are enrollment-driven. I shall return to this factor later.

The first and I believe preferable procedure is to develop a cost standard by various programs and by various levels of instruction. This standard of expenditures for departmental instruction and service can be most meaningfully presented as a cost per full-time equivalent student. Moreover, this standard of expenditures needs to be presented by the same program areas of instruction that were outlined earlier. Such a standard of expenditures by fields and by levels of instruction is shown in Chart 4.

Obviously a set of cost standards such as those presented herein cannot be constructed from thin air. A set of cost standards utilized at any one time reflects past experience and future desired increments. As I have suggested already, a budget formula for instructional expenditures of this kind has as its absolute prerequisite some kind of cost analysis procedure. No state government agency can utilize this kind of formula approach to instructional expenditures unless it does have a method for analyzing actual cost data by program areas and by levels.

In any such cost analysis procedure the cost data from various state institutions will vary considerably by program area and by level. These variations are to be expected. They reflect differences in priorities of emphasis by institutions, some differences in the nature of instruction provided (as between so-called service courses and courses for majors), and differences in income. If the state government permits institutions to be different one from another by retaining for their own use their "outside" income (out-of-state tuition, land grant income, endowment income, and outside gift and grant income), then the cost experience of the individual institution will reflect the volume of this outside income.

If the expenditure experience of institutions differs one from another how does a state government agency develop a cost standard? Such a cost standard obviously may express an average for all state supported institutions or it may express a certain percentile standard in a rank order of individual experiences. In my own use of cost analysis as a state government administrator, I decided that the cost standard should be based upon the cost experience of the institution at the 75th percentile in a rank order of ten or more institutions and campuses.

Current cost experience is, of course, only the base upon which to construct cost standards for distribution of an appropriation for future years. To the base must be added a factor for inflation if it is desired to maintain the current purchasing power of faculty and other salaries. If some advance in faculty and other salaries beyond the cost-of-living factor is desirable and feasible, then this must be added to the base. If some reduction in

faculty work load output is desired in order to permit more faculty time for student advising, research, and public service, then an additional cost factor must be added for this purpose. Thus, a cost standard represents a base of experience plus such increments as represent current higher education support objectives within a state.

It must be emphasized that the cost standards presented in Chart 4 are intended to be illustrative and not a recommendation for use. These cost standards are based upon actual experience, and there are somewhat different cost standards that have been developed in several other states. The important matter here is the procedure rather than any particular set of cost standards. At the same time I do think that these cost standards could be utilized for comparison with the experience and the support objectives of particular state governments. Moreover, it should be observed that these cost standards have been developed in such a way as to provide the same instructional support for program areas and levels which are quite comparable in nature.

Other Formulas

In addition to the program area and level cost standards, there are other approaches to the objectives of achieving equity and adequacy in the distribution of state government appropriations in support of state institutions of higher education. One such approach is a modified version of that just presented as developed in Ohio during the 1960's and further refined in the 1970's. This approach makes use of a fewer number of program categories in making recommendations for state government support of instruction.

For the year 1972-1973 the following program categories and standards of expenditure for departmental instruction and service were utilized:

Program Category	*Standard Expenditure Per FTE Student*
General Studies	630
Technical Education	940
Baccalaureate General	1,025
Baccalaureate Professional	1,560
Master's Degree Programs	2,300
Graduate Professional (Law and Dentistry)	2,300
Doctoral Degree Programs	4,130
Medical Programs (Medicine, Optometry, Veterinary Medicine)	5,020

The principal advantage in the more simplified presentation of standard costs is that of having fewer numbers to use in discussing appropriation needs with state chief executives, state legislators, and their staffs. The issue is one of strategy and convenience in handling appropriation data. It is likely that the more equitable procedure is to make use of the more detailed program costs and standards.

A third kind of procedure is to establish a student-faculty ratio and an average faculty compensation as the basis for arriving at a standard cost for departmental instruction and service. In this way it is possible to determine the faculty compensation part of the departmental budget. To determine the total budget for departmental instruction and service, the faculty compensation amount may be multiplied by a faculty support factor, such as 1.2 or 1.3.

CHART 4

EXPENDITURES PER STUDENT ANNUALLY FOR DEPARTMENTAL INSTRUCTION 1975-1976

	Lower Division	*Upper Division*	*Grad I*	*Grad II*
Agriculture and Natural Resources	900	1,800	2,700	3,600
Architecture and Environmental Design	750	1,500	2,250	3,000
Area Studies	450	900	1,350	1,800
Biological Sciences	750	1,500	2,250	3,000
Business and Management	515	1,030	1,545	2,060
Communications	450	900	1,350	1,800
Computer and Information Sciences	515	1,030	1,545	2,060
Education	515	1,030	1,545	2,060
Engineering	1,050	2,100	3,150	4,200
Fine and Applied Arts	750	1,500	2,250	3,000
Foreign Languages	515	1,030	1,545	2,060
Health Professions				
Hospital and Health Care Administration	515	1,030	1,545	---
Nursing	750	1,500	2,250	3,000
Dentistry	--	--	4,000	---
Medicine	--	--	6,000	---
Pharmacy	750	1,500	2,250	---
Veterinary Medicine	--	--	5,000	---
Medical Laboratory Technology	750	1,500	2,250	---
Other	515	1,030	1,545	- -

	Lower Division	*Lower Division*	*Grad I*	*Grad II*
Home Economics	600	1,200	1,800	2,400
Law	-	--	3,000	--
Letters	450	900	1,350	1,800
Library Science	-	-	1,545	--
Mathematics	450	900	1,350	1,800
Military Science	100	100	--	--
Physical Sciences	750	1,500	2,250	3,000
Psychology	515	1,030	1,545	2,060
Public Affairs and Services	450	900	1,350	1,800
Social Sciences	450	900	1,350	1,800
Theology	-	-	--	--
Interdisciplinary Studies	450	900	1,350	1,800
Occupational and Vocational				
Business and Commerce	515	-	--	--
Data Processing	515	-	--	--
Health Service	750	-	--	--
Mechanical and Engineering	1,050	-	--	--
Natural Science	900	-	--	--
Public Service	515	-	--	--

One problem in the student-faculty ratio approach is that of the detail in which to make use of varied standards. For example, one kind of procedure would be as follows:

	Student-Faculty Ratio	*Average Faculty Compensation*
Lower Division		
General	20-1	$15,000
Professional	12-1	$15,000
Upper Division		
General	12-1	$18,000
Professional	10-1	$18,000
Graduate		
Master's	10-1	$25,000
Professional	15-1	$25,000
Doctoral Programs		
General	8-1	$30,000
Medical	4-1	$30,000

In many instances state institutions are likely to argue that these calculations are not in sufficient detail and that more extensive sets of standard student-faculty ratios are needed. At least in the illustration used here there is a minimum set of student-faculty ratios.

Yet a fourth kind of procedure is to develop a structure of cost weights expressing the relationship between costs of various program areas and levels of instruction. In this procedure, a basic instructional expenditure standard is established in dollar terms. The costs of all other program areas and levels are then expressed in terms of a relationship to the basic income unit. This scheme of weighting may be illustrated as follows:

	Weight
Basic Income Unit (Baccalaureate programs in arts and sciences, business, and education)	1.0
Baccalaureate Programs in architecture, engineering, agriculture, pharmacy, library science, fine and applied arts, allied health professions	2
Master's Level Programs in humanities, social sciences, business, education, journalism, social work, also law	3
Master's Level Programs in biological sciences physical sciences, engineering, and applied sciences	4
Medicine, Dentistry, Veterinary Medicine	5
All Doctoral Degree Programs	6

In this procedure there may be some argument about the desirable expenditure relationship between various instructional programs, but the procedure has the advantage of establishing cost differentials among various programs and levels of instruction on a simplified basis.

All four of these formulas for fixing standard costs of departmental instruction and service have one characteristic in common: they are enrollment-driven. The expenditure provided for instruction is determined by a cost figure multiplied by the number of full-time equivalent student enrollment of a particular state institution of higher education. Thus the number of students in various program areas and at various levels determines the total amount received by the institution.

As enrollments in many state institutions of higher education reach a stable level or even decline, state universities and colleges confront the prospect of small increases in their expenditure budgets for instruction, or even the prospect of a reduction. Needless to say, such prospects create various kinds of difficulty, especially the difficulty of reducing faculty staffing. The only way such reductions can be avoided is to increase expenditures per student or to decrease average faculty compensation.

There does not appear to be any way by which the objectives of equity and adequacy in the distribution of state appropriations can be achieved other than by an enrollment-driven formula. As a consequence, appropriations may vary for a public institution of higher education as enrollments vary.

Research and Public Service

In addition to the primary program area of instruction, some if not all state sponsored and supported institutions of higher education perform two other kinds of primary or basic activities: sponsored research and sponsored public service. Both activities are major categories of expenditure in the 1974 NACUBO financial and reporting manual. It is not necessary, however, to discuss these primary programs in any detail. State government support of these programs is relatively modest in scope.

There are two important characteristics about the sponsored and separately budgeted research programs of institutions of higher education. One characteristic is that sponsored research is generally project research; that is, research performed on the basis of a project objective and of a project budget. The other characteristic is that about 80 percent of the income obtained by institutions of higher education for research projects, or in a few instances for research centers, is derived from the federal government.

State governments in most instances do not appropriate funds for sponsored research. The one exception is that state agricultural experiment station of a Morrill Act land-grant university which obtains support from both the state government and the federal government. Sometimes state governments provide income for other research activity: health research, highway research, and certain special interest research. But in general, separately budgeted funds for support of research projects or of research centers are not a major item in the higher education budget of state governments.

Such research projects and research centers as state governments may determine to support must be budgeted essentially in terms of the importance attached to the projects and centers by the chief executive, the legislature, and their staffs. The customary procedure is to provide some incremental additions year by year to these projects and

centers, representing inflationary costs and some "additive costs." There is no formula as such for determining what the needs are or what the desirable commitments should be for separately budgeted research projects and research centers. Decisions about research projects and research centers represent a political judgment about the needs and resources of a particular state. The income received from state governments and from other sources for sponsored research is restricted income.

The public service activities of a state university or college are divided into several categories: community service, conferences and institutes (continuing education), the cooperative extension service (usually in agriculture and home economics but sometimes embracing the urban population as well), public lectures, and educational broadcasting (radio and television). Here again there are several special characteristics for these separately budgeted public service activities. One characteristic is that most continuing education conferences and seminars are operated on a self-supporting basis, much of the income being derived from charges to the participants in such conferences and seminars; in a few instances grants for these projects may be obtained from private foundations, from business corporations, and from the federal government. Another characteristic is that some public service activities are encouraged or promoted by grants from the federal government. The best known of such public service effort is that of the cooperative agricultural extension service operated through the Morrill Act land-grant state universities. Some assistance in the construction of educational broadcasting facilities has been provided by the federal government. And some community service projects have received financial support from the federal government. A third characteristic is that public service activities are of a project nature. Only broadcasting and cooperative agricultural extension are continuing endeavors.

The extent of the separately budgeted public service activities of state sponsored and supported institutions of higher education provided by state government depends likewise upon the attitudes of state chief executives and state legislators. The budgets for these activities are reviewed as separate matters, and such activities may be discontinued, reduced, continued, or expanded as state government at any one time sees fit. There is no formula for such decision making. The decisions may reflect political judgments about state needs, resources, and priorities. The funds provided by state governments for public service projects or activities become restricted income dedicated to the authorized endeavors.

5 Support Programs

In this section we are concerned primarily with the various support programs essential to the operation of a state institution of higher education. In the 1974 financial accounting and reporting manual of NACUBO, the principal categories of such support activities are: academic support, student services, institutional support, and operation and maintenance of plant. We shall need to make a few comments about each of these program groupings. But some general comments about all four sets of programs are aiso in order.

In a very real sense, these programs constitute the "overhead" operations of a state university or college. These programs are the supportive activities, the activities necessary to the functioning of a state university or state college as an enterprise. These support programs make possible the existence and the operation of a state university or state college performing the primary programs of the institution: instruction, research, and public service. To this listing of primary programs I would add a fourth: the promotion of educational justice, or the provision of student financial assistance.

In the experience of the 1950's and 1960's it was customary to tie these support programs to enrollment growth and the expansion of instructional activities. Sometimes a kind of fixed relationship was established between instructional expenditures and support expenditures. For example, instructional expenditures might be fixed as 65 percent of total expenditures for instruction and support; this meant that support activities were expected to be 35 percent of the total expenditures for instruction and support. The percentages allocated for support were likely to be divided about as follows: academic support, 5 percent; student services, 8 percent; institutional support, 7 percent; and operation of the plant, 15 percent. Thus, in order to determine the total needed expenditures, the budget for instruction would be multiplied by 1.6 times.

Actually, any such relationships as these depended upon several factors: economies of scale, a continually expanding instructional operation, and careful control of support costs. Only an institution with more than 5,000 students could be expected to maintain a 65-35 balance between instructional expenditures and support expenditures. As enrollments increased, support costs tended to increase somewhat less rapidly. State institutions of higher education were concerned to maintain and even to augment their expenditures per student for instruction, but as enrollment grew support expenditures per student might actually decline. This kind of experience resulted from the fact that certain support costs were relatively fixed in nature; no matter how large the university might be there was still only one governing board, one president, one academic vice president, one vice president for operations, etc. Moreover, the use of computerized techniques for student record keeping, student registration, payrolls and financial transactions, and other support efforts, and the use of improved management techniques generally combined to reduce the over-all costs of support programs.

This experience in the management of support or overhead programs during the 1950's and 1960's did not continue into the 1970's. The sudden change in the enrollment experience of many state institutions of higher education beginning in the autumn of 1972, the growing concern with inflation as of 1971 and thereafter, and the energy crisis of 1973 and thereafter altered all previous expenditure relationships between instructional programs and support programs. Moreover, federal government concerns to expand student financial assistance programs as evidenced in the Education Amendments of 1972, and federal government affirmative action programs under the Civil Rights Act of 1964 and the Education Amendments of 1972 placed substantial additional support costs upon all institutions of higher education, public and private.

The problem of the 1970's therefore is to devise new approaches to the determination of the necessary expenditures for the support programs of the state sponsored and state supported institutions of higher education.

One other general comment should be made here. Research projects and centers, public service projects and activities, auxiliary enterprises, hospital operations, and independent operations may all contribute to the support costs of a state university or college. Accordingly, these various programs should make their proper contribution to the support or overhead income of an institution of higher education. This principle of costing has been recognized for a long time in connection with auxiliary enterprises (especially in the operation of residence hall and food service facilities), and has been accepted for some time in connection with sponsored research projects, sponsored research centers, and independent operations funded by federal government grants. This principle of costing has not been equally recognized or practiced in connection with agricultural experiment stations, many public service activities, teaching hospitals, and some auxiliary enterprises (such as a student health service and intercollegiate athletics).

The 1974 financial accounting and reporting manual of NACUBO implies that all support expenditures for instruction, research, public service, and student financial assistance should be reported under the four groupings of academic support, student services, institutional support, and operation and maintenance of plant. It is not clear whether or not these support expenditures related to auxiliary enterprises, hospitals, and independent operations are to be accounted for and reported as an internal cost, or as a transfer of income to the total institutional expenditures for academic support, student services, institutional support, and plant operation.

It would require too extensive a digression in this discussion to undertake to consider the procedures and techniques for determination of the appropriate overhead support properly chargeable to auxiliary enterprises, hospitals, and independent operations. Such procedures and techniques are available, and while the allocation of overhead or support costs to various primary programs is scarcely an exact science, such allocations can be made on a reasonable basis.

It should be noted again that there are two kinds of expenditures for academic support, student services, institutional support, and plant operation: unrestricted and restricted. I believe that the restricted expenditures should represent the proportion of the total cost provided by an allocation or transfer of income from research expenditures, public service expenditures, and any other primary programs. The unrestricted expenditures then represent the support needed for the instructional programs, and for any other primary programs whose overhead is not funded as such.

Academic Support

Academic support includes first of all expenditures for the offices of the deans of the various colleges: the aggregations of academic or instructional departments which are brought together for such common planning and supervision as a state university finds appropriate. The budgets for the various academic deans thus become an important part of academic support. In addition, academic support programs include the costs of the library or learning resources center, of a computer service (or that part of such cost devoted to the instruction of students and general faculty use), of an audio-visual service, of a broadcasting service (to the extent used for classroom instruction), of a demonstration or laboratory school, of museums and galleries, and of any other units providing direct instructional support to academic departments.

In the past there has usually been a tendency in state government appropriation practice to calculate academic support needs on a per full-time student equivalent basis, with some variation (as in library expenditures) upon the basis of program enrollment. Thus the library cost for a lower division student might be fixed at $75 per year, and the library cost for a doctoral degree student might be fixed at $250 per year.

It is not a simple matter to reduce academic support expenditures in proportion to the reduction of enrollment. And yet it is appropriate that these expenditures should have some relationship to enrollment. As enrollment declines, and as the number of faculty positions declines, there should be some reductions also in the requirements for academic support.

Apart from a hard and fast per student calculation of academic support expenditures, a useful procedure might be to determine a per student cost factor and then to provide that in the event of a decline in student enrollment a sliding scale of reductions should take place. For each one percent decline in enrollment, a reduction of only 0.5 percent might be made in academic support expenditures below the level of expenditures which would have obtained if the enrollment had remained constant.

Student Services

Student services include such programs as those for the admission of students, student record keeping and course registration, student academic advising and counseling, student social advising and supervision, student recreational activities, assistance (if any) to student social and cultural activities, assistance (if any) to student publication and student organizational activities, and student financial assistance administration. I am assuming here that a student health service, intercollegiate athletics, and university facilities for student and other activities will be operated as auxiliary enterprises.

A recent special kind of student service has been that of recruiting minority students (especially Blacks) and providing these students with remedial or developmental instruction in order to assist them in meeting expected standards of academic performance. The costs of this kind of student service have increased substantially in recent years for many state universities and colleges.

It seems appropriate that the expenditures for student services should be placed on a per full-time equivalent basis. For 1974-1975 it seems that an expenditure of $100 per student would be a reasonable cost commitment. On the other hand, a separate cost

calculation should be made for student services to disadvantaged students. For example, some $50 per student scoring below the median on a standardized test of academic aptitude, or scoring at the 40th percentile or below might be a reasonable kind of formula arrangement.

Institutional Support

Institutional support includes a wide variety of activities or programs which may be summarized under two categories: top management support and logistical support. Under top management are included expenditures for a governing board, the chief executive officer, the chief academic officer, the chief business officer, and such other offices as those of planning, budgeting, personnel, development, legal service, and investments. Under logistical support are included expenditures for such activities as collection of payments, disbursing, accounting, internal auditing, security, purchasing, communication, printing and reproduction, space management, transportation, and other internal services.

Here again past practice in many state governments has been to relate these expenditures for institutional support to student enrollment. More recently, there has been some inclination to shift these expenditures to dollar volume of total expenditures of the institution. This new practice has a great deal to commend it. This practice moves away from reliance on enrollment and more nearly reflects the actual circumstances which generate the necessary burden of top management and logistical support.

At the same time it is desirable to acknowledge the fact that in this category of expenditure there are economies of scale. The larger the volume of expenditures of an institution, the lesser proportion of the total outlays that will be needed for institutional support. For this reason there has been a disposition in some states to establish a sliding scale of commitment to institutional support. Such a sliding scale might be constructed along these lines:

Total Unrestricted Expenditures for Instruction	*Proportion for Institutional Support*
First $1 million	15%
$1 million to 5 million	13%
$5 million to 10 million	11%
$10 million to 20 million	9%
Over $20 million	8%

The actual scale to be employed is one which needs to be empirically determined and which needs to be revised from time to time in the light of actual experience. The two important considerations in establishing a formula for institutional support are simply these that the support be related in some meaningful way to total expenditures, and that the support recognize a declining proportion of these total expenditures as expenditures increase.

Operation and Maintenance of Plant

Essentially the operation and maintenance of the physical or real property of an institution of higher education involves three kinds of activities: the maintenance of grounds, the maintenance of buildings, and the provision of necessary utility services (heat, power, water, sewerage, and waste disposal). To this set of concerns is usually added fire protection and property insurance.

Current practice in some states is beginning to move in the direction of relating these expenditures to the square footage of the plant and the acreage of the land of an institution. At the same time a considerable escalation in the cost of utility services has taken place in recent years because of the shortage of energy resources for the production of electric power. The inflation in the reproduction value of the physical plant and some experience on campuses in the destruction of plant resources have led to substantial increases in the cost of property insurance.

It is obvious that the expenditures for operation and maintenance of plant need careful review on a continuing basis. For this reason the formula for these costs must be established on an annual or at most on a biennial basis. Some continuing increment in these costs is to be expected as wage rates increase and as the costs of supplies and of utilities advance. For example, an expenditure of $1.75 per square foot per year for the maintenance and operation of the academic plant might be determined as a reasonable base for appropriation support.

Transfers

The NACUBO financial accounting and reporting manual provides for two expenditure categories under the educational and general classification labelled "mandatory transfers" and "nonmandatory transfers." The first category of expenditure involves primarily the transfer of funds required to meet provisions of debt service on educational plant. There may also be a need to transfer some funds to meet the matching requirements for loan fund grants. Nonmandatory transfers are matters of policy determination by a governing board, such as the use of some portion of current income for a plant reserve, an equipment reserve, or a general reserve.

There is no need, I think, for state governments to be concerned with these transfer accounts in its formula development except for the amounts required for debt service on the educational plant. This amount must be determined upon the basis of the actual debt authorized by state government for educational plant purposes. Insofar as matching funds for federal grants are concerned, a separate appropriation for this purpose is justified, which in turn would lead to a transfer to a loan fund account.

Summary

The overhead costs of an institution of higher education are essential to the operation of an enterprise. No organizational entity producing goods or services can continue in being without these overhead or indirect costs. This is certainly true for an enterprise such as a college or university.

Nor have we endeavored here to mention all the kinds of overhead expenditures involved in the current operation of a college or university. For example, nothing has been said here about the importance of working capital, of cash flow, in the operation of an institution and about the possibility that at some times in the year an institution may even have to borrow working capital and so add an interest cost to its expense of institutional support. This kind of situation may arise in state supported institutions of higher education if a state government encounters delays in enacting appropriations or in disbursing appropriations.

A state university or college must expend funds for academic support of instruction, research, and public service; for student services; for institutional support, and for operation and maintenance of plant. With the changing enrollment status of state colleges and universities, some adjustments in formula practice now seem to be in order in various state governments. To some extent these costs can be separated from determination solely on the basis of enrollment, and other considerations as suggested herein can be utilized for an equitable handling of these expenditure requirements.

6 Student Financial Assistance

The whole subject of student financial assistance is so important in the operation of state universities and state colleges that the matter deserves separate mention. In the past this subject was thought to be of only minor interest to public institutions of higher education. The prevailing philosophy and practice of low tuition charges to students at public institutions were thought to answer any need which might arise. More recently, in the past twenty years in particular, this convenient assumption has had to come under careful scrutiny.

It must be pointed out in any discussion of student financial assistance that there are considerable differences in the objectives of these programs. From the point of view of a particular college or university one major objective is that of recruiting outstanding talent. Another and different objective is to promote educational justice, to provide financial resources to students in accordance with their need for individual support in order to obtain access to higher education.

Because of the number of institutions and campuses of higher education in the United States (some 3,000), there is a lively competition for talent among these institutions. For a variety of reasons, institutions seek out students of special skills and competencies: academic ability, musical ability, artistic ability, language ability, dramatic ability, athletic ability, and other abilities. The supply of these special skills and competencies among prospective students, especially skills and competencies of a very high order of potential performance, is never adequate to meet the demands or hopes of all colleges and universities. As a consequence, institutions enter into competition for these individuals and use financial resources as an inducement to persuade a student to enroll in a particular college or university.

There are two variations on this theme of a limited supply of top talent which deserve mention. There are many persons who believe that achievement by young persons should be recognized and rewarded. A scholarship or a prize is thus a form of recognition which may reinforce or encourage a desired pattern of behavior. In this point of view the socioeconomic status of an individual has nothing to do with the recognition; it is achievement and the potential of achievement which should be the object of reward. Accordingly, many colleges and universities award scholarships and prizes simply as a form of recognition. If in the process the institution also happens to recruit or retain students of superior skills and competencies, this result is simply an added incentive to the practice.

The other theme has to do with the recruitment and retention of graduate students. In connection with study for the doctoral degree, universities are confronted again with considerable competition for superior talent. In addition, faculty members engaged in doctoral instruction seek outstanding students because such students add to the prestige of the faculty member and of the graduate program of the university. Moreover, the graduate student is of course older than the undergraduate student, likely to be married

and to have some family obligations, and likely to be separated to some extent from parental support. All of these factors have meant that a "strong" and a "quality" graduate program in most if not all universities has depended upon the availability of financial resources with which to provide fellowship or academic employment to graduate students. It is difficult if not impossible to operate a graduate program in certain circumstances (a high emphasis upon research and scholarly achievement) without student financial resources to accompany the academic financial resources of a university.

The other major concern which has developed in the field of student financial assistance has been that of access, or of equal opportunity, regardless of the family financial circumstances of a prospective student. Within this area of concern, there are certain additional issues. Colleges and universities, public and private, have throughout their history accepted an obligation to assist financially the talented student coming from economically disadvantaged circumstances. When such talent has been identified, some means of providing assistance to the possessor of that talent has generally been forthcoming. Many colleges and universities boast that they recruit talent and then determine the ability of the student to meet the individual costs attached to enrollment. But in recent years the issue of access has been broadened in terms of certain ethnic minorities in American society: especially Blacks, Spanish Americans (primarily those of Puerto Rican and Mexican backgrounds), and American Indians. In order for persons from these backgrounds to have access to higher education, they may require particularly large financial assistance and some adjustment in the expectations of academic performance.

Another reason for concern about student financial resources has been the increased costs of college and university enrollment. These increases have been most noticeable in privately sponsored colleges and universities, but they have occurred in publicly sponsored institutions of higher education as well, especially in the costs of residence services for the student living away from the parental home. Moreover, as more and more students from families above the median level of family income in a state have enrolled in public institutions of higher education, more and more doubt has been raised about the public utility of a policy of low tuition charges to all students.

The consequence of all these concerns has been an increase in federal government financial assistance to students, the development of state government financial assistance programs, the continued utilization of general institutional funds for financial assistance to various categories of students, and some confusion about the desirable public policy at state sponsored and supported institutions of higher education on tuition charges to students. Financial assistance to students has become a considerable operation, involving in 1973-1974 the expenditure of some 1.5 billion dollars or about 5 percent of total expenditures. Of this 1.5 billion dollars of direct institutional expenditures for student aid, only about 1 billion dollars of income earmarked or restricted to student financial assistance was received by the institutions themselves.

It must be emphasized that only a portion of all the funds expended for student financial assistance each year are expended directly through colleges and universities. Some federal government funds for student aid are channeled through institutions of higher education: other federal funds (especially veterans educational benefits and social security educational benefits) are paid directly to students themselves. Most state government programs of financial assistance to students are directed to students rather than through institutions. And many private grants are similarly handled.

There are two important considerations affecting state governments that need to be mentioned here in connection with student financial assistance. One consideration is that state governments generally do not include any subsidy to state sponsored and supported institutions of higher education for student financial assistance. The other consideration is that state governments when they make decisions about the desirable level of tuition charges to students need at the same time to make decisions about the desirable level of student financial assistance.

State Subsidy to Institutions for Student Assistance

In general, few if any state governments make an appropriation to state institutions of higher education to enable the institutions to provide financial assistance to students. As a result, the subsidy formula for support of state institutions does not include any provision for student aid. This practice seems to be justified by considerations of desirable public policy.

To be sure, a state institution of higher education may receive federal government grants and private gifts and endowment for student financial assistance. These receipts constitute restricted income for student financial assistance purposes. Certainly, no state university or college should be discouraged from obtaining such restricted income.

In some instances a federal government student aid program may require some matching funds, as in the instance of NDEA student loans and in the work study program. Some consideration should be given by state governments to providing all or part of these matching funds.

State universities and colleges may utilize some of the instructional and support income received from state governments for student aid purposes. There is some question whether or not this exercise of institutional autonomy should be permitted. On balance, I am inclined to favor such autonomy, so long as the action of the institution is clearly known and reported.

State Student Aid Programs

When for a variety of reasons state governments decide to increase the tuition charges to students at state sponsored and supported institutions of higher education, it is essential that at the same time state governments act to ensure that students from low income families are not being denied access to higher education by this action. The method for achieving this assurance is to enact or to expand a state student financial assistance program.

As a general standard, no increase in tuition charges to students at state universities and colleges should fall upon students or the families of students below the median family income in a state. As tuition charges are increased, student financial assistance programs must also be increased. A failure to take such action is a failure to promote educational justice.

7 Conclusion

Two vital issues of public concern must be restated in conclusion of this discussion. One primary issue is that of the objective or objectives to be achieved in any state government procedure for providing appropriation support to state institutions of higher education. The other primary issue is that of the income resources to be included in any calculation of the income support available to state universities and colleges.

I have recommended here that the objectives in state government support of higher education should be the dual ones of equity and adequacy. I do not define equity in terms of equality of income among state institutions of higher education, nor do I define it in terms of differential quality among state universities and colleges. My definition of equity is the provision of equal support for state colleges and universities based upon program differences and enrollment load. But every student in every state institution of higher education enrolled in comparable programs of instruction by fields and by level deserves the same instructional support as every other student. And each state institution of higher education should have its essential support needs met on a comparable basis with due allowance for size, plant resources, and changing circumstances.

There are those who believe strongly that all state institutions of higher education should share equally in all available income, with the possible exception of income for sponsored research and for sponsored public service. Their position is that state institutions should offer an equal educational opportunity to all students and that historical accidents in income distribution should not be permitted to increase expenditures for students at some institutions while other students at other institutions enjoy a less favorable expenditure circumstance. Those who hold this position would make deductions from the state formula for various kinds of "outside" income in order to have more state government income to divide among all institutions on an equal basis.

The kinds of "outside" income which might thus be involved would include federal government grants for so-called land-grant universities and colleges, federal government reimbursement of overhead costs, out-of-state tuition charges, general endowment income, and general gift income. All of these kinds of income would be included as off-sets against the appropriation entitlement, and the state government appropriation pool would then be distributed after these off-sets had been deducted. The result of this arrangement is an approach toward "absolute" equity in the distribution of state government support for state universities and state colleges.

My own personal position is one of not approving this particular approach to formula budgeting by state government. My sense of the need for equity is satisfied by a formula that results in an equality of appropriation support for instruction based upon two and only two sources of income, the state government general appropriation for departmental instruction and institutional support plus the general instructional charge to all students. All other sources of "outside" income then become an add-on for the benefit of the individual state institution of higher education which happens to generate this additional income

I recommend this second position essentially for two reasons. First, I am disposed to believe that the arguments on behalf of equity in the distribution of available income are satisfied by my restricted definition of available income. Secondly, I am willing that there should be differences among state institutions of higher education based upon differences in age, differences in tradition, differences in qualitative status, and differences in the ability to attract outside income. I am not prepared to accept the position that the purpose of a state appropriation formula is to achieve a leveling of income resources among various state institutions of higher education.

I look upon my own position as a compromise or middle position between those on the one hand who want a leveling of income among state institutions and those on the other hand who want state support of differences among institutions. I suspect this position will not satisfy partisans of either of the polarized positions. To me the recommended position here is a reasonable compromise between a leveling process of state appropriations and a process supposed to promote qualitative differences among institutions. I think it is undesirable to discourage state institutions from raising outside income, and I think it is undesirable for state governments to attempt to make qualitative distinctions among state institutions of higher education. Qualitative distinctions of this kind can quickly become political distinctions, distinctions based upon political influence and political clout.

In any event, here is an important issue of state government financial policy to be resolved within the political process of state government decision-making.

Some further words about the concept of adequacy may be desirable here. As I have already pointed out, I propose that two sources of institutional income be included in the definition of adequate income: state general subsidy for instruction and instructional support and the general charge to all students for instructional service. In the past state governments have made the decision about the first amount and governing boards of state institutions of higher education have been permitted to determine the second amount. Currently, it appears that the discretion of governing boards to make this second decision is being circumscribed if not completely eliminated. And some governing boards have been reluctant to increase the general instructional charge to students even when they have the authority to do so because such increases may provide an excuse to governors and legislators to reduce the general appropriation.

It is clearly evident today, I believe, that the whole issue of instructional charges to students in state institutions of higher education has become a political question that will have to be resolved by the political process of state government. In this process state boards of higher education may make recommendations but decisions will have to be made by governors and state legislatures. I see no other way for this kind of decision to be made under the prevailing political circumstance in this country.

Given these current circumstances, I think it is essential for state boards of higher education to develop expenditure standards related to two sources of instructional income: the state government general appropriation and an institutional general instructional charge to students. An expenditure standard based upon these two sources of income then becomes the definition of adequacy. If state governments are unwilling to appropriate an amount that meets this definition of adequacy, then state governments have this choice: (1) to appropriate an inadequate amount or (2) to authorize an increase in the general instructional charge to students.

It seems to me important for governors and state legislatures to know the choice they are making. A state board of higher education must be prepared to defend its expenditure standards as adequate. There is no other basis upon which to establish expenditure standards. If a state government decides not to meet the recommended faculty compensation schedule and a recommended faculty work load and not to provide the recommended departmental support and other support costs, then this is the privilege of state government. But the choice of an alternative means of financing adequacy of expenditures ought to be known and ought to be considered.

Here is the appropriate place to emphasize once again that when a state government decides to increase student charges, I believe very strongly that a state government must increase its student aid program or must be satisfied that federal government student aid programs will meet the additional burden for low income students. As a rule of thumb, I propose that not even a moderate increase in the instructional charge to students should fall upon any undergraduate student from a family whose annual income is below the median family income in the state.

It is desirable public policy that state governments assure the equity and the adequacy of their appropriations to the state institutions of higher education, however structured and operated. These twin objectives can be achieved by the development of a formula or series of formulas providing comparable instructional support by major programs of instruction, along with comparable support of academic support activities, student services, institutional support, and operation and maintenance of the physical plant. Moreover, the state subsidy and the authorized student tuition charges should constitute the unrestricted income of state institutions. There should be no state government effort to discourage state institutions of higher education from obtaining all possible restricted income for their operations.

A subsidy formula exclusively based upon student enrollment may not be fair in a time when enrollments are stabilizing or declining. At the same time an enrollment-driven formula may encourage institutions to seek additional students, a practice which may or may not fit labor-market demands for highly educated talent. Enrollment appears to be the appropriate base for instructional expenditures, for academic support, and for student services. For other programs, such as institutional support and plant operation, a different kind of formula approach seems highly desirable.

A purely incremental approach to state government budgeting for higher education is undesirable because it may perpetuate inequities among institutions that will have developed over time. This defect in the incremental approach can be avoided by "zero-based" budgeting, by the calculation of expenditure needs upon the full performance of the needed primary programs and the needed support programs. Yet incremental costs will necessarily appear in any budget system because of personnel costs and inflationary pressures.

A budget formula in state government for the support of higher education needs continuing attention. The formula itself must be revised from time to time to reflect changing circumstances and changing production technology. The formula may be revised also as cost analysis techniques are improved and as cost standards are developed. But the principal purposes of a formula should not be overlooked in the process of revision: to simplify the presentation of appropriation needs and choices in a readily understandable format, to ensure adequacy of state government support to deliver desired higher education services, and to realize equity in the distribution of state appropriation support of higher education institutions.

At the same time it must be emphasized that not all state government appropriations for higher education can be or should be calculated upon the basis of a formula. I recommend that instructional activities be funded upon the basi of a formula in order to achieve equity and adequacy in the distribution of the available appropriation. There are other needs that are not susceptible to a formula approach.

When a state government decides to appropriate funds for research, for public service, for student aid, and for operations of a teaching hospital, these needs must be determined upon the basis of the particular programs to be funded. Usually, on a continuing basis such programs will be provided appropriations on an incremental basis. These programs are, of course, subject to alteration with changing objectives, changing circumstances, and changing priorities.

In recent years suggestions have been made that state governments ought to appropriate certain discretionary funds to a state board of higher education for distribution to state universities and colleges. One such amount might be devoted to the encouragement of innovation in instructional programs. Another such amount might be made available for the development of new instructional programs. Indeed, when a new instructional program is undertaken by a state university or college, some start-up funds not based upon an enrollment formula are essential.

A somewhat different kind of proposal has been one to provide appropriations to cushion the period of enrollment adjustment within a university or college. As I have indicated earlier, I believe some kind of adjustment factor can be incorporated in an instructional formula. If this is not done, then some other kind of adjustment arrangement seems to me to be desirable and justifiable. Enrollment losses will necessarily lead to reductions in institutional appropriations, but these reductions can better be absorbed if spread over at least a three year period of time.

There is one other consideration that should be noted here. Although no one is exactly certain of the proper dimensions, I believe strongly that there is an economic lower and upper limit for the enrollment size of state colleges and universities. The Carnegie Commission on Higher Education has suggested what the desirable size of various institutions ought to be. I am disposed to say on the basis of experience that a two-year campus offering a college transfer program and technical education programs must have an enrollment of not fewer than 1,500 students if it is to be economical to operate. It seems to me that a four-year undergraduate college with no graduate programs must have at least 2,500 students, and it would be better if such a college had 5,000 students. A comprehensive state university with limited graduate programs needs to have at least 10,000 students, and a research university with various graduate and graduate professional components needs around 25,000 students.

No doubt there is some kind of upper limit that is economically desirable also. I think that when a university has more than 40,000 students on a single campus, it generates increased costs per student. There are some persons who would put this figure closer to 30,000 students. We have a great deal still to learn about both minimum and maximum desirable sizes for public institutions of higher education.

Some planning today is being done in terms of the minimum and maximum desirable size of enrollment in particular programs, such as the minimum economical enrollment for an undergraduate program in history, or a minimum economical enrollment for a master's degree program in a foreign language or a minimum economic enrollment for a

doctor's degree program in chemistry. This kind of planning is urgently needed and must be continued. Even in a large state university there may be particular instructional programs too small for economical operation. Such small programs might very well be eliminated.

There may well be circumstances, however, that warrant the operation of a small institution and a small instructional program. Considerations of geographical accessibility may override considerations of economical size for an institution. Considerations of urgent need for highly specialized personnel may override considerations of economical size in a particular instructional program. Where these considerations arise and when decisions are made to continue institutions or programs regardless of size, then a formula approach to appropriation funding is not applicable. Some additional funding beyond that justified by enrollment size will be needed.

The formula approach to the distribution of appropriation funding of instructional activity and of the support programs for instructional activity is an essential feature of state government procedure. But the formula approach is not applicable to all higher education programs, and may have to be modified in special situations. The appropriation formula is the beginning, not the ending, for state government financing of higher education.

Appendix

Statement of

Current Funds Revenues

and

Current funds Expenditures

State University
Fiscal Year 1974

Revenues	*Current Year*			*Prior Year*
	Unrestricted	*Restricted*	*Total*	
Tuition and Fees	7,200,000	7,300,000	14,500,000	14,500,000
Undergraduate Instruction	4,800,000	2,800,000	7,600,000	7,600,000
State Residents	3,600,000	—	3,600,000	3,600,000
Out-of-State-Residents	1,200,000	2,800,000	4,000,000	4,000,000
Graduate and Graduate Professional Instruction	2,400,000	1,350,000	3,750,000	3,750,000
State Residents	1,500,000	—	1,500,000	1,500,000
Out-of-State Residents	900,000	1,350,000	2,250,000	2,250,000
Student Services Fee	—	3,000,000	3,000,000	3,000,000
Facility Fee	—	—	—	—
Miscellaneous Fees	—	150,000	150,000	150,000
Federal Appropriations	—	1,500,000	1,500,000	,500,000
Land Grant		500,000	500,000	500,000
Health Sciences Capitation	—	1,000,000	1,000,000	1,000,000
State Appropriations	28,800,000	15,500,000	44,300,000	40,680,000
State General Subsidy	28,800,000	—	28,800,000	26,500,000
Agricultural Research	—	4,000,000	4,000,000	3,780,000
Other Research	—	1,000,000	1,000,000	900,000
Agricultural Extension	—	3,000,000	3,000,000	2,750,000
Other Public Service	—	500,000	500,000	500,000
Subsidy of Teaching Hospital	—	6,000,000	6,000,000	5,400,000
Fee Replacement		1,000,000	1,000,000	850,000
Local Appropriations	—	1,000,000	1,000,000	1,000,000
Cooperative Extension	—	1,000,000	1,000,000	1,000,000
Federal Grants and Contracts	—	20,700,000	20,700,000	19,580,000
Research Grants and Contracts	—	12,000,000	12,000,000	11,000,000
Agricultural Research	—	3,000,000	3,000,000	3,000,000
Agricultural Extension	—	1,000,000	1,000,000	1,000,000
Other Public Service	—	200,000	200,000	200,000
Student Financial Assistance	—	3,000,000	3,000,000	3,000,000
General Grants	—	—	—	—
Overhead Cost Reimbursement		1,500,000	1,500,000	1,380,000

Revenues (Continued)	Current Year			Prior Year
	Unrestricted	Restricted	Total	
State Grants and Contracts	—	1,000,000	1,000,000	1,000,000
Private Gifts and Grants	—	2,300,000	2,300,000	2,100,000
General	—	1,200,000	1,200,000	1,150,000
Student Aid	—	1,000,000	1,000,000	850,000
Other	—	100,000	100,000	100,000
Endowment		1,000,000	1,000,000	1,000,000
Sales and Services of Educational Activities	—	500,000	500,000	500,000
Demonstration Schools	—	100,000	100,000	100,000
Clinics	—	100,000	100,000	100,000
Veterinary Clinic	—	50,000	50,000	50,000
Demonstration Farms	—	150,000	150,000	150,000
Instructional Materials	—	50,000	50,000	50,000
Museums and Galleries	—	20,000	20,000	20,000
Other	—	30,000	30,000	30,000
Sales and Services of Auxiliary Enterprises	—	20,000,000	20,000,000	19,050,000
Residence Halls	—	5,000,000	5,000,000	4,500,000
Food Service	—	7,200,000	7,200,000	7,000,000
Student Health	—	1,000,000	1,000,000	900,000
Student Recreation	—	—	—	—
Book Store	—	2,000,000	2,000,000	1,900,000
University Center	—	1,500,000	1,500,000	1,500,000
Intercollegiate Athletics	—	3,000,000	3,000,000	3,000,000
Other	—	300,000	300,000	250,000
Sales and Services of Hospitals	—	6,500,000	6,500,000	5,950,000
Medical Care	—	2,000,000	2,000,000	1,800,000
Patient Care	—	3,000,000	3,000,000	2,800,000
Outpatient Care	—	1,000,000	1,000,000	900,000
Other Service	—	500,000	500,000	450,000
Expired Term Endowment	—	—	—	—
Other Sources	—	500,000	500,000	500,000
Independent Operations	—	1,000,000	1,000,000	900,000
TOTALS	$36,000,000	$78,800,000	$114,800,000	$108,260,000

Expenditures and Transfers	*Current Year*			*Prior Year*
	Unrestricted	*Restricted*	*Total*	
Educational and General	$36,000,000	$41,350,000	$77,350,000	$73,960,000
Instruction	25,000,000	4,050,000	29,050,000	26,000,000
Research	—	21,000,000	21,000,000	19,680,000
Public Service	—	5,700,000	5,700,000	4,450,000
Student Aid	—	5,400,000	5,400,000	5,000,000
Academic Support	2,200,000	—	2,200,000	3,000,000
Student Services	2,000,000	1,400,000	3,400,000	3,480,000
Institutional Support	2,000,000	1,100,000	3,100,000	3,000,000
Plant Operation	4,800,000	1,500,000	6,300,000	6,000,000
Mandatory Transfer				
Principal and Interest	—	1,000,000	1,000,000	850,000
Renewals and Replacement	—	--	—	2,300,000
Loan Fund Matching	—	200,000	200,000	200,000
Auxiliary Enterprises	—	23,000,000	23,000,000	22,050,000
Residence Halls	—	4,500,000	4,500,000	4,200,000
Food Service	—	6,900,000	6,900,000	6,500,000
Student Health	—	1,900,000	1,900,000	1,800,000
Student Recreation	—	450,000	450,000	450,000
Book Store	—	1,800,000	1,800,000	1,700,000
University Center	—	2,750,000	2,750,000	2,700,000
Intercollegiate Athletics	—	2,850,000	2,850,000	2,750,000
Mandatory Transfer				
Principal and Interest	—	1,300,000	1,300,000	1,300,000
Renewals and Replacement	—	550,000	550,000	650,000
Hospital Operations	—	12,500,000	12,500,000	11,350,000
Medical Care	—	6,500,000	6,500,000	6,000,000
Patient Care	—	3,500,000	3,500,000	3,050,000
Support and Administration	—	1,500,000	1,500,000	1,300,000
Transfers	—	1,000,000	1,000,000	1,000,000
Independent Operations	—	1,000,000	1,000,000	900,000
Other Transfers				
Excess of Receipts	—	950,000	950,000	—
TOTALS	$36,000,000	$78,800,000	$114,800,000	$108,260,000

engage in research and public service (another supposed index of quality). The question is then asked whether or not a state government ought not to provide at least one (perhaps more) institution of higher education of high quality. If so, then increased income must be distributed to the high quality institution or institutions.

In recent years, the quality debate has taken a new turn in state government decision-making. As more students of average cognitive skill and even of below average cognitive skill are enrolled in higher education, then the question arises whether or not it doesn't cost more to educate the lower quality student than the higher quality student. Some educators argue that cost is associated not with skills as such but with the "value added" to an individual's skill through higher education. And there are some persons who insist that the costs of higher education should be equated with the employability gained by an individual.

Enough has been set forth here to demonstrate that in practice the objective of equity or fairness in the distribution of state government appropriations for higher education is not easy to define or to carry out. I believe that a workable definition of equity in state government decision-making is to provide the same income resources from state appropriations to each institution of higher education for each full-time equivalent student enrolled in comparable programs of instruction. How this definition is to be applied will be set forth in a subsequent section. But I recognize that there are special circumstances of enrollment size, location, stage of development, and of clientele served which require modification of or exceptions to this definition.

What then about qualitative differences? I think there are such differences among institutions and among students. But I do not know of any basis for saying that high quality deserves higher income or for saying that poorer quality deserves higher income. For this reason I am disposed to recommend that state appropriation distribution be based upon an equal resource support per student by program and by program level. Other sources of income can then provide the margin of difference which circumstances require.

I think we must justify this definition of equity in terms of the basic philosophy of higher education and in terms of the tradition of equality of opportunity in a democratic society. If we are striving to achieve equality of opportunity and if we are striving to encourage persons to develop their cognitive and related skills to their fullest potential, then I believe no other definition of equity is defensible. And the objective of equity becomes then an essential of state government appropriation practice.

In essence, this paper is an effort to define equity in the distribution of appropriation support by state government to state institutions of higher education. The devising of practical means for achieving the objective of equity is our subject of discussion. It is not necessary here then to anticipate the various important details of this discussion. It will be sufficient at the moment simply to outline the three primary ingredients in an operative definition of equity.

These three ingredients are: (1) appropriation support based upon program costs; (2) appropriation support based upon work load, (3) appropriation support based upon a common definition of available income. These ingredients will be considered at length in the subsequent sections of this paper. It must be emphasized again that the concept of equity does not mean a distribution of support involving the same amount of money for each institution regardless of size, or the same amount of money per student regardless of programs offered. There will be differences in the support to each institution based