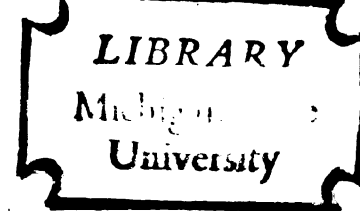


THE APPLICATION OF FORMULA AND COST ANALYSIS
PROCEDURES TO THE BUDGETING OF
ACADEMIC DEPARTMENTS

Thesis for the Degree of Ph.D.
MICHIGAN STATE UNIVERSITY

Douglas Allen Stuart

1966



This is to certify that the

thesis entitled

THE APPLICATION OF FORMULA AND COST ANALYSIS
PROCEDURES TO THE BUDGETING OF
ACADEMIC DEPARTMENTS

presented by

Douglas Allen Stuart

**has been accepted towards fulfillment
of the requirements for**

Ph.D. **degree in** Education

Paul L. Gressel

Major professor

Date November 18, 1966

~~137~~

~~119~~

~~24~~

~~24~~

~~15~~

~~18~~

~~1~~

JUL 29 2003

THE APPLICATION OF FORMULA AND COST ANALYSIS
PROCEDURES TO THE BUDGETING OF
ACADEMIC DEPARTMENTS

By

Douglas Allen Stuart

AN ABSTRACT OF
A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Administration and Higher Education

1966

ABSTRACT

THE APPLICATION OF FORMULA AND COST ANALYSIS PROCEDURES TO THE BUDGETING OF ACADEMIC DEPARTMENTS

By Douglas Allen Stuart

Statement of the Problem

Budget formulas and cost analysis techniques have been employed with reasonable success in a number of states to obtain more adequate support for and greater equity in the distribution of funds to publicly supported colleges and universities. While these budgetary procedures appear to have gained acceptance for their usefulness in the determination of the total budget requirements of an institution, they have not been considered applicable to the internal management of such institutions. Nevertheless, the problem of internal allocation of resources is just as critical as the allocation of appropriations among institutions. The purpose of this study, therefore, was to examine some of the various types of formulas and cost analysis procedures currently employed in state-wide budgeting for higher education to determine which concepts or procedures, if any, might be relevant and appropriate to the development of improved operating budgets of academic departments.

Organization of the Study

Three representative budget procedures employed by the States of California, Florida, and Ohio were applied to 15 selected departments of Michigan State University in order to develop alternate budget estimates for comparison with each other and with actual departmental budget patterns. The 15 academic departments included in the study are found in all major universities and were selected for their similarities as well as their differences. The departments were divided into laboratory and non-laboratory groups according to the extent to which laboratory instruction enters into the total instructional load.

Historical data on the selected departments were extracted from various documents prepared by the Office of Institutional Research at Michigan State University for the years, 1962-65. Three year weighted averages of the historical data and statistical data derived therefrom were developed to portray certain characteristics or operational patterns of each department, each group of departments, and the combined group. To supplement the application of weighted average normative data in the three budget procedures and to gain an understanding of the relationships of certain cost factors, simple correlation and regression analysis was also employed.

Applying both the weighted average and regression norms to Fall, 1965, instructional volumes, various combinations of staffing

and budget estimates were developed for each department utilizing 1) a factorial budgeting approach based on certain cost rates per student-credit-hour at selected student levels; 2) a staffing approach based on student-credit-hour productivity; and 3) a staffing approach based on course-classification and related class sizes.

Major Findings of the Study

The variation in budget projections derived from different combinations of objective procedures and various combinations of normative data indicate that the degree of equity achieved depends upon the way in which workload is defined and measured. For some departments it makes little difference which procedure is employed, but for certain departments the budget allocation resulting from the application of objective procedures varies considerably, depending upon whether objective measures of departmental input or output are the primary determinants of staffing requirements. Similarly, budget allocations can be influenced greatly by unusual faculty-mix requirements.

However, in spite of the caution with which normative data or standards should be applied to objective procedures, such procedures appear to offer a rational basis for allocating resources and a better means of evaluating the effectiveness of resource utilization. In order to select a suitable objective procedure and appropriate

normative data, academic officials must first provide answers to several questions concerning those factors which should be standardized and those which should be determined on an individual basis. By reducing appropriate budget considerations to objective terms, university officials can better utilize their time and talents in giving closer attention to those budget factors or activities which must be evaluated subjectively.

The most significant contribution of objective budget procedures may very well be in the area of long-range planning and program development, where they may be employed to project a wide variety of alternative courses of action for evaluation and subsequent selection of preferred alternatives. Given such long-range perspective and direction, annual operating budgets should thus be reasonably simple to derive objectively and, most certainly, they would then reflect a planned rather than an accidental development of academic departments and their various programs.

THE APPLICATION OF FORMULA AND COST ANALYSIS
PROCEDURES TO THE BUDGETING OF
ACADEMIC DEPARTMENTS

By

Douglas Allen Stuart

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Administration and Higher Education

1966

ACKNOWLEDGEMENTS

The writer wishes to express his sincere appreciation to Dr. Paul L. Dressel for his guidance and helpful criticism throughout the study and for his making available the facilities of the Office of Institutional Research during the study.

The writer also wishes to express his appreciation to Dr. Margaret F. Lorimer and Dr. Joseph L. Saupe for their encouragement and helpful suggestions throughout the study.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	ii
LIST OF FIGURES	iv
LIST OF APPENDICES	v
 Chapter	
I. RATIONALE OF THE STUDY	1
II. RELATED IDEAS AND LITERATURE	10
III. ANALYSIS OF FORMULA AND COST ANALYSIS PROCEDURES EMPLOYED IN STATE-WIDE BUDGETING	28
IV. APPLICATION OF OBJECTIVE BUDGET PROCEDURES TO THE INTERNAL BUDGETING OF ACADEMIC DEPARTMENTS	45
V. COMPARATIVE ANALYSIS OF ALTERNATE BUDGET PROCEDURES	69
VI. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS FOR FUTURE RESEARCH	103
 APPENDIX A: Definitions	 113
APPENDIX B: Historical Data	117
APPENDIX C: Budget Projections	131
BIBLIOGRAPHY	146

LIST OF FIGURES

Figure	Page
1. Combination of objective budget procedures and normative data applied to selected academic departments	50
2. Classification of laboratory and non-laboratory academic departments	53
3. Comparison of departmental budget projections derived from the application of alternate budget procedures with actual 1965-66 budget levels	71
4. Comparison of departmental budget projections derived from the application of alternate instructional cost norms (unit cost approach and regression analysis)	78
5. Comparison of departmental budget projections derived from the application of alternate productivity norms (SCH productivity approach)	79
6. Comparison of departmental budget projections derived from the application of alternate staffing norms (course classification approach)	82
7. Comparison of departmental budget projections derived from the application of alternate salary norms (SCH productivity approach)	84
8. Comparison of departmental budget projections derived from the application of alternate operating expense unit cost norms	86

LIST OF APPENDICES

APPENDIX A

	Page
Definitions	113

APPENDIX B

Table

1-a. Weighted average instructional volume in student-credit-hours, fall quarters, 1962-65	118
1-b. Weighted average full-time-equivalent students of selected departments, fall quarters, 1962-65	119
1-c. Academic year and weighted average student-credit-hours of selected departments, 1962-65	120
1-d. Proportion of weighted average fall student-credit-hours taught at each instructional level of selected departments, 1962-65	121
1-e. Actual fall 1965 and projected 1965-66 student-credit-hours of selected departments	122
2-a. Weighted average full-time-equivalent faculty of selected departments, 1962-65 (by function)	123
2-b. Weighted average staffing ratios of regular faculty, graduate assistant, and clerical personnel of selected departments, 1962-65	124
3. Weighted average fall instructional productivity and student-faculty ratios of selected departments, 1962-65 . . .	125
4. Weighted average academic year general fund budgets for selected departments, 1962-65	126

APPENDIX B (Continued)

Table	Page
5-a. Weighted average salaries cost per student-credit-hour (all levels) of selected departments, 1962-65	127
5-b. Weighted average salaries cost per student-credit-hour by level of selected departments, 1962-65	128
6-a. Weighted average overhead cost per student-credit-hour of selected departments, 1962-65	129
6-b. Weighted average operating expense per student-credit-hour (by level) of selected departments, 1962-65	130

APPENDIX C

Table	
7-a. Projected 1965-66 budget requirements for selected departments of Michigan State University, based on the cost analysis approach (academic and clerical salaries)..	132
7-b. Projected 1965-66 budget requirements for selected departments of Michigan State University, based on the cost analysis approach (operating expenses).	133
7-c. Projected 1965-66 budget requirements for selected departments of Michigan State University, based on regression analysis (total budget on total fall SCH). . . .	134
8-a. Projected 1965-66 academic staff for selected departments of Michigan State University, based on SCH productivity rates and related staffing ratios (departmental norms). . .	135
8-b. Projected 1965-66 academic staff for selected departments of Michigan State University, based on SCH productivity rates and related staffing ratios (group norms).	136
8-c. Projected 1965-66 academic staff for selected departments of Michigan State University, based on SCH productivity rates and related staffing ratios (combined group norms).	137
8-d. Projected and actual 1965-66 academic staff for selected departments of Michigan State University, projections based on regression analysis (total FTEF on total fall SCH)	138

APPENDIX C (Continued)

Table	Page
9-a. Projected 1965-66 salary budgets for selected departments of Michigan State University, based on the SCH productivity approach with alternate staffing and salary norms	139
9-b. Projected and actual 1965-66 salary budgets for selected departments of Michigan State University, based on regression analysis (total FTEF on total SCH)	140
10-a. Projected fall, 1965 teaching units of selected departments of Michigan State University, based on the course classification approach	141
10-b. Projected academic staff requirements of selected departments of Michigan State University for 1965-66, based on course classifications and units-of-teaching	142
10-c. Projected academic staff requirements of selected departments of Michigan State University for 1965-66, based on course classifications and credits-of-teaching . . .	143
11-a. Projected 1965-66 salary budgets for selected departments of Michigan State University, based on the course classification approach with alternate staffing and salary norms (units-of-teaching)	144
11-b. Projected 1965-66 salary budgets for selected departments of Michigan State University, based on the course classification approach with alternate staffing and salary norms (credits-of-teaching)	145

CHAPTER I

RATIONALE OF THE STUDY

Introduction

Comparisons of workload and cost data of apparently similar / academic departments at Michigan State University reveal wide variations in operational practice and raise a number of questions concerning the reasons for such differences. For example, when departments offering similar academic programs differ appreciably on such measures as average teaching load, average section size, percentage of faculty time devoted to departmental research or administrative activities, some examination of the means by which such differences and possible inequities have developed appears to be in order. Variations in departmental operations which occur by design or as a result of specific policy decisions are understandable and possibly defensible; variations which result from improper or inadequate budgeting of institutional resources are much more subject to question.

The resources, both human and financial, available to educational programs and organizations are limited. In times of

prosperity, institutions of higher education may find themselves with unprecedented amounts of financial support, and yet may not be able to recruit the faculty or staff required to carry out desired programs.¹ In times of rapid enrollment growth, an institution may have the finances for capital improvements but may not be able to design, build, and equip new facilities fast enough to keep up with the increasing demand. Even the 24-hour day and the typical 252-day work-year impose certain limitations on the amount of service or scholarly activity which may be expected from any given combination of human, physical, and financial resources. A primary objective of administration and the major task of the budget process, therefore, is the achievement of the most effective utilization of all resources, limited as they may be, in order to provide the greatest possible return on the educational investment.

In times of economic crisis, and sometimes even during prosperous years, colleges and universities are called upon to achieve greater "economy and efficiency" in their educational operations -- as an alternative to increased appropriations.² Although the concepts

¹Better Utilization of College Teaching Resources (New York: The Fund for the Advancement of Education, 1959), p. 7.

²David S. Hill and Fred J. Kelly, Economy in Higher Education (New York: The Carnegie Foundation for the Advancement of Teaching, 1933), p. v.; Milwaukee Journal, June 24, 1965; Article presenting Wisconsin Chamber of Commerce demands for reduction in costs of higher education to taxpayers.

of efficiency and economy serve a useful function in the sound management of all sorts of enterprises, they must be considered within the context of program effectiveness or contribution to the overall objectives of an institution. The optimization of institutional resources to achieve the greatest return certainly involves, but is not limited to, matters of efficiency and economy. Consequently, the allocation of resources within an institution requires many value judgments which attempt to balance various cost factors, all of which involve questions of efficiency or economy, with the anticipated or desired outcomes. The extent to which the budget process contributes to the formation of sound judgments determines its worth as an administrative tool and, undoubtedly, the extent to which institutional objectives may be fully realized.

At the state level, a similar situation exists where there is keen competition among publicly supported institutions for ever-increasing support. Particularly in those states which support a large number and variety of institutions of differing sizes and states of development, is the problem of what constitutes a "fair share" of the total state appropriation for each institution. The difficult question of what constitutes a reasonable level of support for each institution has fostered the development of a variety of procedures or formulas for relating budget requirements to certain measures of workload. Miller has traced this relatively recent development in state-wide

budgeting for higher education and has noted that in spite of the initial reluctance on the part of educators to employ such budgetary devices, there has been a general agreement that the overall support for higher education has been improved in those states which have adopted such procedures.³

While these budgetary procedures appear to have gained reasonable acceptance for their usefulness in the determination of the total budget requirements of an institution, they apparently have not been considered equally suitable for internal budgeting or administration of colleges and universities.⁴ Such caution may be well founded, but the problems of internal allocation of resources appear to be quite similar to those encountered at the state level, nevertheless. Therefore, any search for improvement of budgetary procedures at the institutional level might well include an examination of formula or cost analysis concepts or techniques employed in various states. For, as Miller suggests, "budget formulas might make a positive contribution to more effective management of higher education institutions."⁵

James L. Miller, Jr., State Budgeting for Higher Education--The Use of Formulas and Cost Analysis, Publication of the Institute of Public Administration (Ann Arbor: The University of Michigan, 1964), pp. 94-149.

Western Interstate Commission for Higher Education, Yardsticks and Formulas in University Budgeting. (Boulder: Western Interstate Commission for Higher Education, 1959), p. 68.

Miller, op. cit., pp. 167-68.

Purpose of This Study

The purpose of this study was to examine the various types of formula and cost analysis procedures currently employed in state-wide budgeting for higher education to determine which concepts or procedures, if any, might be relevant and appropriate to the development of improved operating budgets for academic departments of colleges and universities. The study was designed to serve two major objectives: (1) the development of greater understanding and appreciation of important budget considerations through analysis of the underlying assumptions of various budget approaches, and (2) the achievement of a greater degree of rationality in the budget process through incorporation of objective procedures where applicable.

Basic Assumptions

A primary assumption of this study was that all academic departments of an institution possess certain similarities which are identifiable, measurable, and which can be described in objective terms. At the same time, most academic departments possess certain differences which affect budgetary needs. It was further assumed that certain comparisons of educational operations can be made by informed educators and that such comparisons are both desirable and necessary to the effective management of institutional resources.

Although workload and cost data present no direct measure of the actual quality of programs and activities of academic departments, it must be assumed that the quality of the educational environment created by an institution and its operational units is determined, for the most part, by the combination of cost factors employed at any given point in time. Thus, in order to produce an educational environment of a given quality, educators must be able to translate into quantitative terms what reasonably should be expected in the way of human and material resources for various types of programs and for the various levels of student development. It was assumed, therefore, that the quantitative analysis of such input factors should provide some measure of departmental needs and, indirectly, a partial indication of program quality -- both of which relate to budgetary considerations.

Definitions of Terms

The increasing emphasis and importance attached to cost studies and statistical analyses within and between institutions of higher education in recent years have contributed to and resulted from the development or refinement of certain concepts and terminology for describing various input and output factors of university operations.⁶ Various efforts to produce useful cost data for inter-

⁶California and Western Conference Cost and Statistical Study. (Berkeley: University of California, n.d.).

institutional comparisons have demonstrated the need for increased standardization of definitions and/or classifications. Consequently, educators have today a rather extensive taxonomy of operational concepts and terminology which provides the necessary tools for institutional analyses.⁷ For any given study, however, the intended purposes may dictate certain modifications of some definitions in order to make the data collected more useful for a given type of analysis. Definitions of the major terms employed in this study follow those governing the collection of the data utilized⁸ or suggested by Miller,⁹ and are presented in Appendix A.

Limitations of the Study

Formulas based on objective data have been employed to some extent in higher education budgeting in such areas as physical plant operation and maintenance or auxillary enterprises, each of

⁷Handbook of Data and Definitions in Higher Education.
(American Association of Collegiate Registrars and Admissions Officers, 1962), p. 6.

⁸Manual for the Preparation of Uniform Cost Reports:
Michigan State Colleges and Universities (Lansing: Michigan Council of State College Presidents, 1962); Memorandum of May 11, 1962, from Task Force Committee re: Definitions of Terms for Incorporation in "Manual of Procedures"

⁹Miller, op. cit., pp. 4-7.

which has its counterpart in the business or industrial world. However, since objective data on academic programs typically have not been incorporated into the budgetary process, this study focused upon the budgetary considerations common to academic departments of publicly supported universities. The study was limited to the various classifications of departmental expenditures financed by current general funds which, for the most part, are derived from state appropriations and student fees.

Organization of the Study

From an analysis of representative procedures employed in the state-wide budgeting of public colleges and universities, three alternate approaches were selected for use in projecting budget requirements of academic departments. These objective budget procedures were applied to selected departments of Michigan State University to develop budget estimates for comparison with each other and with actual staffing and financial patterns of the departments. The implications and underlying assumptions were analyzed for their relevance to internal budgeting of academic departments.

Chapter I has presented the rationale and applicability of the study for practice. Chapter II presents the related ideas and literature upon which the study was developed. Chapter III presents an analysis of three objective budget approaches employed in inter-institutional budgeting. Chapter IV describes the nature of the data utilized in the

study, its source, the application of objective budget procedures, and the results obtained. Chapter V presents a comparative analysis of the alternate budget procedures when applied to departmental operations in terms of their results, their meeting of budget criteria, and their contribution to program review and planning and improved management of institutional resources. Chapter VI presents a summary and conclusions of the study along with suggestions of areas deserving further research.

CHAPTER II

RELATED IDEAS AND LITERATURE

The budgeting of college and university operations is, or should be, a continuous process which both reflects and shapes the educational purposes and programs of the institution. Properly employed, the budget process can and must help administrators to focus their attention, at all times, upon the fundamental purposes of the institution and the basic policy decisions necessary to the effective and efficient utilization of available resources. Similarly, budgetary considerations must be oriented to the needs of the future-- in accordance with institutional objectives -- rather than simply a perpetuation of programs and activities geared to the needs of the past.

The Budget Process and Suggested Reforms

Budgeting is the principal tool of financial administration. As a tool it cannot insure good or responsible financial management, but a well conceived budget system can and should provide the opportunity for efficient and responsible management and equally important, the opportunity to determine if management is efficient and responsible.¹

¹John F. Briggs, A Refined Program Budget for State Budgets (Washington, D. C.: The American University -- Center for Technology and Administration, School of Government and Public Administration, 1962), pp. 4-5.

As typically employed in colleges and universities, the budget process is often regarded as a necessary evil -- a distasteful chore to be endured solely for the purpose of gaining the largest measure of financial support possible during any given fiscal period. Similarly, the subsequent control over expenditures imposed by the adoption of a final operating budget is quite often a source of irritation to members of the academic community and a handy scapegoat for administrators who need an explanation for mediocre or unsatisfactory management results.

Such attitudes toward the budget process, particularly among publicly supported universities, may stem from the notion that educators should be free to establish the level of financial support necessary to meet society's needs and then state legislatures should be expected to appropriate that amount. Although educators make a point of revising and proposing new educational services to better meet society's needs, they may not consider the overall social and political considerations inherent in the legislative appropriation process. Not only do publicly supported colleges and universities compete with each other for necessary support, they also compete with other governmental service agencies. In all agencies, the opportunities for service are unlimited, but resources are limited. Thus the ultimate responsibility for determining the degree to which the various governmental programs of a state are to be supported with public tax money must be assumed by the elected representatives of the people.

Nevertheless, in order to gain the most favorable appropriation level possible under such heavy competition, a commonly employed tactic of most agencies is to include sufficient padding to allow for the customary shrinkage at all levels of review. Typically, the major focus of budget requests is upon the matter of dollar support necessary for proposed expenditure levels. Seldom are budget requests justified in terms that invite comparison with the requests of similar departments or institutions. In fact, the justifications offered for ever increasing support often involve only those factors which are most apt to create the best image of the organization and to present the most convincing case during budget reviews.

The keen competition faced by most institutions and their component departments during budget review time encourages tactics suggestive of those illustrated in the book, How to Lie with Statistics.² Certainly the traditional budget approach often involves the use of the selected statistic, cloudy exhortation, personal persuasion -- or any other form of lobbying which might prove effective in gaining the maximum possible support for a given department or institution. It is perhaps little wonder that under traditional budgetary procedures, "educators, in their eagerness to receive sufficient funds are often so

² Darrell Huff, How to Lie with Statistics (New York: W. W. Norton and Co., Inc., 1954), 142 pp.

preoccupied with how to get money that they neglect careful attention to how it is used."³

As Walker suggests, "When colleges operate on limited funds, every dollar is presumed to be employed economically."⁴ Consequently, budgetary reviews and the resulting decisions are most likely to revolve around questions of how additional resources should be spent. Traditional budgetary presentation and review practices are summed up by Harris:

Neither trustees nor faculty, nor administration, tend to examine the allocation of funds in the existing budget. Once \$250,000 is allocated to paleontology, or \$1 million to inter-collegiate athletics, these outlays are sacred, and no cut is likely except in the midst of a great depression. Even budget officers of state governments tend to accept past budgets and only raise questions concerning additional funds requested.⁵

Thus as typically employed, traditional budgetary procedure is often unsatisfactory because no genuine attempt is made to examine existing budgets to discover the possibilities of cuts on past budgets.⁶

The university budget has been referred to as "an expression of the hopes and dreams of educators," which would suggest that each

³John Dale Russell, in Yardsticks and Formulas in University Budgeting (Boulder: Western Interstate Commission for Higher Education, 1959), p. 11.

⁴Ernest W. Walker, "To Measure Operating Efficiency," College and University Business, August, 1960, p. 24.

⁵Seymour E. Harris, Higher Education: Resources and Finance (New York: McGraw-Hill Book Co., 1962), pp. 561-62.

⁶Ibid.

year's requests were derived from basic policy decisions calculated to make the best possible use of resources available for the implementation of institutional objectives. In reality, the usual operating budget is more apt to reflect a large number and variety of random decisions of the past which have ongoing implications for the future. As Dodds points out:

The freshman president soon realizes that the hand of history is heavy on him; he does not write his budget on a clear slate. Basic operations must go on and be paid for against rising costs. So innocent a document as the catalogue listing of curricular offerings embodies continuing commitments, as do research programs that must be allowed to continue, even though current support has failed them, and the guarantee of tenure to large elements of the faculty.⁷

Dodds then goes on to reiterate the basic difficulty with most financially oriented budget procedures and suggests the influence objectives should have over budgetary decisions:

Thus the very fact that budgets must be adopted periodically tends to raise forward-looking questions and to call attention of administration and faculty to the danger of laissez-faire assumption that there are no imbalances, inequities, or inefficiencies in earlier expenditure patterns, that yesterday's programs are unquestionably those most suited to society's needs tomorrow. Thus with all its aspects of inflexibility, the budget provides the chief central instrument of control over the future.⁸

Other writers have suggested changes in budgetary procedures which would permit all parties concerned to consider departmental or

⁷Harold W. Dodds, The Academic President -- Educator or Caretaker? (New York: McGraw-Hill Book Co., Inc., 1962), p. 182.

⁸Ibid, p. 183.

institutional requests in relation to prior accomplishments as well as previous expenditure levels. Heneman, for example, stresses the importance of basing budget needs in terms of the purposes or objectives to be carried out and of the workload involved:

Each level of management from departments on up should be asked to determine, on an annual basis, the job it is to do and what it will take by way of people, supplies, materials, equipment, services, and facilities to do it. This should then be translated into dollar requirements. All estimates of expenditure prepared in this manner then should be consolidated into an over-all budget consistent with the university's income position. . .

This provides a basis on which to determine needs and offers an opportunity to transfer or direct money and people to the areas of highest priority or importance. This system of building up estimates of expenditure provides standards and yardsticks against which performance can be measured.

Unfortunately, many colleges and universities do not require such supporting data for proposed expenditures but instead make comparisons only with amounts spent in the preceding year or years . . .

Of course it is not known whether the funds spent during the preceding year were too great or too small, and it is difficult, if not impossible for the finance committee to determine what workload was involved, whether objectives were accomplished, and what standards of performance were followed. Requirements for services may change from year to year, and in many cases standards of performance should be improved. These will have an effect on both the number of people and the amount of dollars required to carry on a particular function.⁹

The utility of comparative cost data on past operations and realistic cost estimates of proposed programs or activities, incorporated

⁹H. J. Heneman, in Dexter M. Keezer, ed., Financing Higher Education -- 1960-70 (New York: McGraw-Hill Book Co., Inc., 1959, pp. 129-30.

with budget requests, has also been stressed by various writers.¹⁰ Unit cost data, taken out of the context of the budget process, are generally regarded as interesting statistics which are of little value unless they lead to further analysis of how and why the costs happen to be what they were at some point in time. Properly used in conjunction with budget preparation and review, there appears to be some agreement that unit costs can be "useful in raising questions about departmental practices, in calling attention to undernourished departments and schools, and in combating extravagance in others."¹¹

Related Developments in Governmental Budgeting

Many of the recommendations for improving college and university budgeting cited above appear to be derived from or at least parallel similar developments in governmental budgeting during the past two decades. The growing complexity of governmental programs and services at the federal, state, and local levels with their increasingly

¹⁰ Logan Wilson, "Analyzing and Evaluating Costs in Higher Education," The Educational Record, April, 1961, p. 103; John Dale Russell, Finance of Higher Education Rev. Ed. (Chicago: University of Chicago Press, 1954), p. 75; Thad L. Hungate, Finance in Educational Management of Colleges and Universities (New York: Bureau of Publications, Teachers College, Columbia University, 1954), p. 103ff.; and Lyman A. Glenny, Autonomy of Public Colleges (New York: McGraw-Hill Book Co., Inc., 1959), pp. 111-12.

¹¹ Dodds, op. cit., pp. 174-175.

diverse sources of financial support has demonstrated the need for more meaningful budgetary presentations and greater refinement of the budget process as a tool of sound public administration. As a consequence, a relatively new budgetary approach known as program and/or performance budgeting has received gradual but steady acceptance as it has been increasingly adopted by governmental units at all levels. As Hudson has pointed out, the concept of program derived budgets is not a new idea, but is one which was given impetus in the federal government by the Commission on Reorganization of the Federal Government, popularly known as the Hoover Commission, during the late 1940's.¹² Although employed by several federal departments both prior to and since the endorsement of the Hoover Commission, the program budget appears to have received its greatest publicity from its application to the complex and critical budgetary considerations of the Department of Defense. Nevertheless, there is a growing body of literature on the application of the program budget concept to state and municipal governmental affairs.

The development of program and performance budgeting has been detailed by Kammerer, Burkhead, and others.¹³ Briefly, the

¹²Cathryn Seckler Hudson, "Performance Budgeting in the Government of the United States," Public Finance, Vol. VII, No. 4, pp. 327-30.

¹³Jesse Burkhead, Government Budgeting (New York: John Wiley & Sons, Inc., 1956) Ch. 6; Gladys M. Kammerer, Program Budgeting: An Aid to Understanding. Public Administration Clearing Service, University of Florida, Civic Information Series No. 32 (Gainesville, Florida: University of Florida, 1959).

program budget approach directs the attention of all concerned away from the detailed listing of objects of expenditure for some future fiscal period to an explanation of those programs, functions, and activities which each governmental department proposes to conduct. At the operating agency level, performance budgets present estimates of future resource needs based on measures of past performance or accomplishments and thus provide certain benchmarks or yardsticks by which agencies' future performances can be assessed.

Since public supported colleges and universities must compete with the many other public service agencies for their financial sustenance, it is understandable that the influence of program and performance budget concepts has found its way into educational budgeting. A partial explanation of this is the fact that several of those states which have been noted for their experimentation with adoption of program budgeting have also been proponents of coordinated systems of higher education -- both formal and informal. Where coordination of public colleges and universities has occurred, there have been serious efforts to establish meaningful and reliable measures by which the collective and individual needs of the higher education system can be assessed.

To a large extent, the resulting budget procedures have been designed by state budget analysts rather than educators and thus have been imposed from without rather than having developed out of

institutionally recognized needs.¹⁴ As might be expected, full acceptance of such procedures has lagged behind their incorporation in many instances. However, it appears that the development of more objective budget procedures has resulted in much improved relations between higher education officials and budget analysts in the executive and legislative branches of state governments. Apparently, such efforts have been fruitful in building confidence in existing operations and in justifying increased financial support for expanded operations.

Development of Higher Education Budget Formulas

Glenny has noted that the creation and development of statewide coordinating and governing agencies for higher education have resulted in part from an intense interest shown by legislative and state executive officers in the budgeting of colleges and universities. And, while they have generally been granted functions of greater importance, coordinating agencies have tended to concentrate their attention on matters of inter-institutional budgeting -- the function which produces the most tangible and immediate rewards for the effort expended. Typically, such agencies have sought to provide budgets equitable and reasonably satisfactory to all institutions according to

¹⁴Miller, op. cit., p. 81.

relative needs; to provide uniform, comparable, and convincing fiscal information for legislators and executive officers; and to promote economy and efficiency where possible.¹⁵

Efforts to achieve these budgetary goals have resulted in the adoption of various methods of organizing, analyzing, and presenting meaningful data on the many diverse types of educational operations; in some states these methods have resulted in formalized procedures which may or may not be labeled formulas, depending upon the connotation such a term carries in the particular area. Miller has presented a detailed review of the development of such formula or cost analysis budget procedures employed by various states. He notes that such objective procedures have generally been used to assist in the analysis of budgetary needs and in the presentation of budgetary information, but occasionally they have been used as a basis for distributing supplemental funds among institutions when enrollments exceed estimates. On the basis of his many interviews across the country, he reports:

The prevailing attitude of state officials and higher education officials is to regard a formula as a device whose usefulness is limited to quantifying the status-quo and then projecting it into the future, with appropriate allowance for inevitable increases in enrollments and in the level of salaries.¹⁶

¹⁵Glenny, op. cit., p. 115

¹⁶Miller, op. cit., p. 167

General agreement to limit the use of budget formulas may well stem from the fear of additional loss of institutional autonomy to the coordinating agencies or other central government officials. Or, such an attitude may be simply another illustration of educators' concern over ways of getting money rather than with the complex problem of resource optimization. Certainly, if formulas are useful in projecting the status-quo into the future, it should follow that they should likewise be suitable for projecting institutional needs as they ought to be -- if educators were only willing to examine the relationships between resources used and the achievements to be realized.

With the growing variety and complexity of university programs, the current and anticipated problems associated with increasing enrollments, and the ever-present concern over mounting costs of higher education, the need for top-level management of institutions becomes apparent.¹⁷ To meet such a need, administrative practitioners must be ready at all times to examine any administrative tool or technique for possible adaptation to their specific needs -- regardless of the particular origin of such techniques, be it business or industry, governmental, or military operations. While the wholesale adoption of any procedure or administrative device -- even among like operations -- is generally subject to question, the skillful incorporation of relevant and useful tools or techniques into a continuing effort to improve the administrative process is both feasible and desirable. Educators

¹⁷"The Affluent Professors," Forbes, June 1, 1966, p. 58.

probably need to examine some of their basic assumptions about budgeting of university operations and of the relevance of objective procedures to internal management. At the same time, they need to take a closer look at some of the major procedures employed in state-wide budgeting to see if they are truly as limited in their usefulness as the literature suggests.

Representative Approaches to Objective Budgeting

It has been noted that with few exceptions, formula or cost analysis procedures employed in state-wide budgeting differ somewhat from state to state.¹⁸ There have emerged, however, at least three different approaches to the analysis of budgetary needs. The first of these, the base year approach, uses the operations of a given year as a basic reference point and then gives major consideration to the necessary increases in budget requirements in accordance with the various changes that have occurred since the base year. In a sense, this approach is similar to the traditional budget presentation and review cited previously, except that it portrays changes over a longer period of time. At the same time, a given fiscal period may be selected as the base year because of general acceptance of a given input-output relationship as being reasonable or desirable.

The second approach, which also appears to characterize the

¹⁸Miller, op. cit., p. 151.

formula approach to budgeting, is the budget base concept. Under this scheme, the primary reason for an institution's existence is used as the base and all other functions or supporting activities are related in some arbitrary manner to the basic function. In spite of increasing importance being given to the research and public service functions, universities which operate under the budget base approach still use the instructional budget as the basis for determining all other budget allocations, expressed as a percentage of the instructional budget.

A variation of the budget base approach utilizes a cost per unit of service procedure, which relates all expenditures of a department or institution to some measure of instructional load -- the student-credit-hour or full-time-equivalent student (FTES) by level (freshman, senior, graduate, etc.). In other words, the costs of all activities, both related and unrelated to the instructional function, are folded into the unit cost figure as though they were essential to the teaching-learning process.

The third and less common budgetary approach involving formulas calls for the analysis of budgetary needs according to functions performed -- permitting each activity to justify its existence and resource requirements on its own merits. The functional approach requires a general acceptance of the many and diverse functions of a university -- as well as rather extensive supporting data or norms from which evaluations of performance and budget needs can be made.

Criteria for Evaluating Budget Procedures

Burkhead's model of budgetary decision-making takes into account the interaction of three major functions which he defines as expertise, communications, and responsibility.¹⁹ As the terms imply, the expertise aspect is concerned with the measurement and comparison of the probable effects of several courses of action; communications involves the identification and evaluation of the views and sentiments of the various groups which are affected by budget decision; and responsibility involves the weighing of facts and values derived from the first two aspects, and the making of an informed judgment as to the best course of action.

Burkhead's budgetary model thus provides the proper perspective for any study concerned with a particular segment of the budgetary process in that it calls attention to the fact that any modifications or improvements in one phase must eventually be evaluated in terms of how much they contribute to or impair the results of the other aspects of budgetary decision-making. Thus, while the central concern of this study is the possible contribution of formulas or cost-analysis to the expertise aspect of operational budgeting, the criteria for evaluating the various procedures examined were selected for their significance to the whole process.

¹⁹Burkhead, op. cit., p. 56; amplified by Miller, op. cit., pp. 44-50.

The criteria employed in the evaluation of the alternate budget approaches examined in the study were:

Objectivity Methods employed for measuring budgetary needs must be capable of describing in quantitative terms the types of programs, functions, and activities for which they are designed. The use of objective data and relationships derived therefrom makes explicit some of the rationale behind many subjective decisions and allows for checking of estimates or for comparisons of subsequent performance.

Equity One of the primary objectives of formulas or objective budget procedures is the equitable treatment of competing programs and organizations. Such procedures should contribute to the achievement of adequate budgetary support for all authorized programs and activities, but should also provide some means of assessing the cost-value relationship of established activities in light of changing objectives or goals of an institution.

Flexibility In view of the dynamic nature of higher education, objective budget procedures must lend themselves to change in concert with the evolutionary (or revolutionary) forces at work in all areas of programming, methodology, etc. Such procedures should be so designed as to aid, or perhaps even force, the changes necessary in higher education operations needed to contend with changing social problems.

Focus Objective procedures must help to focus the attention of all concerned with the budget process on the major goals to be

pursued -- and the policy decisions necessary to their achievement.

Budget formulas and cost analysis procedures, to be of assistance to the policy or decision-making process, must direct the necessary attention to the essential value questions which must be answered.

Sensitivity Formulas or objective budget procedures should be sensitive to important program and organizational differences and should be responsive to changes therein.

Utility To be of maximum utility, any formula or cost analysis procedure should be capable of making a contribution to all phases of the budget cycle -- formulation, allocation, implementation, and evaluation. At the same time, any procedure employed must be able to justify its own use in terms of the values derived from the cost and effort involved.

Validity Formula or cost analysis procedures are a form of fiscal shorthand which can be useful in organizing, summarizing, and presenting great quantities of operational or budget data in simplified form so that the essential questions relating to basic policy decisions can be answered. Such a shorthand must, however, be based on valid measures of workload -- the relationships of cost factors to the projected work to be accomplished.

Summary

Chapter II has presented the context in which the central concern of this study must be considered. The nature of the budget process, as employed in public higher education, and some of the currently recognized shortcomings of traditional practice were examined. Other considerations which relate to the problem of the study included the similarity of budget problems between higher education and other governmental or public service agencies, as well as the competitive nature of the appropriation process at the state level. The development of program and performance budgeting in various governmental operations was cited for its influence on recent developments in the coordination of state systems of higher education and the accompanying development of more objective approaches to institutional budgeting. Finally, several criteria were suggested for evaluating the possible contributions that might be made to the entire budget process by the application of various formula or cost analysis procedures to the internal affairs of an institution. In the following chapter, three representative objective budget procedures employed in state-wide budgeting for higher education will be examined in some detail.

CHAPTER III

ANALYSIS OF FORMULA AND COST ANALYSIS PROCEDURES EMPLOYED IN STATE-WIDE BUDGETING

Miller has described in detail the various formula and cost analysis procedures currently employed by a number of states and has noted the basic similarities and minor variations among these objective budget approaches.¹ For the purpose of this study, a cost analysis and two formula procedures which constitute current practice in the states of Indiana, Florida, and California, were selected for application to internal budgeting problems of colleges and universities. Each of the three major approaches is discussed briefly in the sections to follow.

The Ratio Approach

The Student-Faculty Ratio For many years, colleges and universities have used the student-faculty ratio to describe their academic environment in their promotional literature and accrediting

¹Miller, op. cit., pp. 94-149.

reports or, on occasion, to justify requests for additional staff and corresponding budget increases. In some states the student-faculty ratio is still used as the primary basis for relating institutional budgets to the size of student enrollment.² However, the relative merit of the student-faculty ratio as a budget base depends in large measure upon the degree of similarity of academic objectives and programs. The more heterogeneous the programs, the less desirable the student-faculty ratio becomes for budget purposes.

In the case of small single-purpose colleges, for instance, the student-faculty ratio possesses some meaning in that it approximates the average class size -- or the theoretical index of the interaction possible in the teaching-learning process. It says nothing, however, about the actual workload of faculty, nor about the kind of instructional environment actually created by an institution.

In the large multi-purpose university, the student-faculty ratio becomes merely an indicator of the relative size of two partially related sets of statistics. At any major university, instruction of students constitutes only one of several functions performed by faculty members. As the proportion of faculty time devoted to instruction decreases and the proportion of effort expended on research or public services increases, the student-faculty ratio becomes less meaningful and possibly even misleading. Consequently, the appropriateness of

² Miller, op. cit., p. 131.

of any given ratio is always subject to question by economy minded legislators -- and is not easily defended.³

Recognition of the differences among state institutions and their operations, which can be concealed by such a ratio, has led to the adoption in some states of different sets of ratios for different types and sizes of institutions. In other states, the inequities which resulted from the application of standard ratios to all kinds of institutions have served as a necessary stimulus to the development of other budgetary measures designed to correct such inequities and to better portray the actual higher education needs of a state.

Student-Credit-Hour Productivity Ratio As an alternative to the student-faculty ratio, certain states have developed a productivity ratio which describes the average instructional output in terms of student-credit-hours (SCH) generated per full-time equivalent (FTE) faculty member. Although the student-credit-hour represents process as much as actual production, the fact that it is commonly employed by institutions as a form of currency for establishing degree eligibility, or for fee assessment purposes, etc., suggests that the student-credit-hour is not inappropriate as a measure of instructional workload.

In some states, SCH productivity and unit cost rates are standardized by instructional level and are expressed as a fixed part

³Western Interstate Commission for Higher Education, Yard-Sticks and Formulas in University Budgeting (Boulder: February, 1959), pp. 51-52.

of the budget formulas.⁴ Florida, on the other hand, employs SCH productivity rates by instructional level which differ with each institution according to the nature and purpose of the instructional programs or the particular stage of development thereof. In addition, the Florida budget procedure leaves blank all rates and ratios which constitute policy questions that should be considered each new budget period. Although this approach provides no guarantee that the productivity rates will not become fixed in time, it does call attention to the fact that such productivity rates or related staffing ratios should be subject to periodic review and modification where necessary.

The first step in the Florida approach, as in all objective budget procedures, involves the estimation or projection of probable enrollments or volume of instruction at selected course or student levels. Once the anticipated volume of instruction has been determined, various SCH productivity rates which have been deemed appropriate for each type and level of program are then divided into the volume of instruction estimates for each level to derive the total number of FTE teaching positions required. The total number of teaching positions then serves as a base for determining, on a ratio basis, the number of FTE staff members to be authorized for other functions such as research, public or professional service, academic counseling, or administrative and committee assignments.

⁴Miller, op. cit., p. 107.

When the total academic staff requirements have been ascertained, the next step in the procedure involves a policy decision concerning the number or proportion of academic positions which should be filled with temporary staff members such as graduate assistants, assistant instructors, etc. When the most desirable faculty-mix has been established in light of market conditions, institutional objectives, and/or prior commitments, the financial support required for academic salaries is determined by multiplying the average salary appropriate to each major category by the number of positions recommended therein; the summation of the salary requirements in each personnel category selected gives the total academic salaries requirement for the combined functions to be performed.

The next policy question to be answered under the Florida procedure concerns the appropriate level of clerical and technical support to be provided. When the proper ratio of academic to non-academic personnel has been determined, the total number of technical, clerical, and student assistant positions is derived by applying this ratio. The appropriate number or percentage of student-assistant positions must be determined and subtracted from the total number of positions to establish the number of regular FTE non-academic positions to be filled. As with the academic positions, the average salary levels appropriate to the various classifications involved are applied to the number of corresponding FTE positions to derive the total outlay required for support personnel.

The combined personal service budgets constitute the major portion of the total operating budget of an institution and thus receives the greatest amount of attention in budget formulas or cost analyses. Because of the heterogeneous nature and relative size of general operating expenses such as supplies and services, equipment, etc., such expenditures are typically subjected to much less scrutiny than the salaries budget. Consequently, it is conceivable that the various efforts put forth to achieve equitable distribution of finances among institutions on the basis of workload and staffing requirements may well be negated by a lack of comparable effort to determine adequate levels of implementary expense.

Under the Florida budget procedure, however, instructional operating expenses are estimated on the basis of a certain rate per SCH for the anticipated volume of instruction -- a rate which may approximate prior spending levels or which may reflect more "reasonable" levels of support. The Florida procedure then utilizes the instructional expense budget as a base for estimating the operating expense budgets for research activities -- according to some acceptable ratio.⁵

⁵Budget Director's Office, Analysis of Legislative Budgets: University System of the State of Florida -- 1961-63, (Tallahassee: Budget Director's Office, 1961).

The Course Classification Approach

California has developed a different approach to objective budgeting for application to its rapidly growing and expanding State College System.⁶ The California procedure is based on a functional approach which utilizes various formulas, ratios, or rates appropriate to the function under consideration. The budgetary requirements of the instructional function are determined by a rather detailed and complex faculty staffing formula which suggests a greater degree of accuracy of prediction and sensitivity to differences among institutions than achieved by other approaches. On the other hand, the classification system possesses a degree of rigidity which the Florida procedure attempts to avoid.

Under the faculty staffing formula, the total number of teachers required for the instructional programs of each institution is determined on a course-by-course basis, in which projected enrollments in each course offered during a given semester is related to a pre-determined optimum section size. The number of sections required for each course then determines the number of FTE teachers to be employed. Optimum section size and the corresponding cut-off points are determined by the particular classification assigned to each

⁶Jon S. Peters, Genesis: The Faculty Staffing Formula (Sacramento: Educational Planning Office, Division of State Colleges and Teacher Education, California State Department of Education, June, 1961), (Mimeographed).

course according to the nature of the subject matter, the method of instruction, and/or the limitations imposed by the nature of the physical plant. Thus, courses or segments of courses may be classified as lecture, lecture-discussion, seminar, laboratory, or activity type instructional programs. Each classification carries a specific weight, based primarily on the number of contact hours involved.

The teaching load of a full-time-equivalent faculty member is standardized at 12 work units, or approximately 36 hours per week of classroom teaching, preparation, and grading activities; an additional 3 units, or approximately 9 hours per week, are added for such functions as student advising, public service activities, and administrative or committee work. Thus, for budgetary purposes, the standard work-week of the FTE faculty member employed by one of the California State Colleges is set at approximately 45 hours or 15 work units.

The total faculty requirements for the projected budget period are thus determined by calculating the total number of teaching units to be provided for a given volume of instruction. The number of teaching units for each section of a course is the product of the number of credits awarded (or imputed) to the section and the particular weight assigned by the specific course classification. The total number of teaching units required, when divided by the standard load of 12 units, determines the total number of FTE faculty positions required for regularly scheduled instruction. To provide additional FTE positions to cover those faculty members whose instructional responsibilities include the

supervision of student teachers, undergraduate or graduate research, etc., the total enrollment in each of such activities is divided by an appropriate student-teacher ratio.

Because of the nature of the institutions to which the faculty staffing formula applies, departmental research apparently does not constitute a major function. Thus, any faculty effort which is directed to such activity appears to be handled on a released-time basis or carried as an overload.⁷

As in the Florida budget procedure, administrative and non-academic personnel requirements are related to the size of the teaching staff on a proportional basis. Although the faculty staffing formula contains no provision for graduate-assistant positions as a component of the teaching faculty, each institution's needs are apparently considered on an individual basis. Those colleges which do list such positions presumably maintain substantial graduate programs in contrast to some of the more recently established institutions which employ no graduate-assistants. The overall allowance for faculty-related clerical and technical or student personnel offers no breakdown of the various classifications, as does the Florida approach, and thus is a matter that is determined by each particular situation.

The financial support required for the number of personnel

⁷"Released time" might represent the margin between budgeted and actual staffing requirements if estimates exceed enrollments, or time which may be created by scheduling fewer and larger class sections than the faculty staffing formula calls for.

projected under the California approach is calculated by applying appropriate salary averages to the various personnel classifications -- as under the Florida procedure.⁸ The estimation of instructional operating expense is handled on a functional basis and makes use of current expenditure levels as a guide to future needs.

The Cost Analysis Approach

A relatively simple and direct method of projecting budget requirements of academic programs, the cost-analysis approach simply applies a pre-determined cost rate to a projected number of cost units to arrive at the total financial support needed for a future budget period. However, the actual determination of the unit-cost rates to be used generally involves a rather detailed and complex cost analysis procedure.

Although several states employ unit-cost data in various aspects of their budget procedure, Indiana uses the cost approach to determine the total financial needs of its two major universities and its two smaller regional universities. The Indiana procedure, first of all, determines the direct costs of teaching each class offered during the previous year and then allocates all other indirect or overhead costs of the institution to each class on a proportional basis.

⁸ Division of Institutional Research, 1964-65 Status Report of the California State Colleges -- Part G: Fall Instructional Faculty (Inglewood: Office of the Chancellor, California State Colleges, January, 1965).

The total cost of each class is then divided among various instructional levels according to the proportion of students in the class who were classified as freshmen, sophomores, graduate, etc. The final unit cost, instead of relating to student-credit-hours as is customary, is expressed as a cost per student, classified by instructional level. This unit cost is determined by adding all class costs assigned to each level and then dividing by the number of (head count) students enrolled at that level.

The resulting cost rate per student at each level presents in broad summary form the amount of financial support required (or expected) for each student enrolled during the future budget period. Appropriate adjustments to account for changes in price or salary levels would, of course, be made to translate historical cost patterns into future needs. Although much of the detailed information generated through the cost analysis procedure may be utilized internally, such gross cost estimates tend to conceal much more than they reveal about the operation of each institution. It would seem, therefore, that legislators and state budget analysts might come to raise serious objections to the Indiana approach. However, the assumption that all operating costs of an institution ultimately relate to the size of the student body apparently is acceptable to those concerned with the budget process in Indiana.

Similarities in the Alternate Procedures

In spite of their differences in emphasis and methodology, each of the approaches described appears to have been reasonably successful, in its own peculiar setting, in meeting the challenges which brought about their development. Educators and state budget officials apparently are in general agreement that the adoption of these objective budget procedures has resulted in 1) increased public support of higher education in keeping with increased demands for educational services, 2) increased evidence of operational efficiency and economy in colleges and universities, and 3) greater equity in the allocation of public funds among higher education institutions.

As indicated at the beginning of this chapter, the various objective budget approaches have much in common, and, to some extent, can be converted from one system to another quite readily. For example, given the definition of a full-time-equivalent student at the various instructional levels and the desired student-faculty ratio, it is a simple matter to convert such ratios to a SCH productivity rate. Given a certain SCH productivity rate and the average teaching load in credit-hours, it is possible to calculate the average section size that must be achieved. Conversely, given certain limitations such as academic space and time, along with average teaching load, one may determine the maximum productivity rate which can be achieved in regularly scheduled instructional programs.

Moreover, given the average faculty salary along with either the average teaching load and average section size or the average SCH productivity rate, it is possible to determine the average salary cost per SCH for a department -- or an institution. Conversely, given a certain amount of financial support and a specified SCH productivity, one can quickly find the average faculty salary that is possible under such constraints. In equation form, these cost factors bear the following relationship:

$$\begin{array}{l} \text{Average Salary Cost} \\ \text{per Student-} \\ \text{Credit-Hour} \end{array} = \frac{\text{Average Instructional Salary}}{\text{Student-Credit-Hours per FTE} \\ \text{Faculty Member}}$$

or

$$\begin{array}{l} \text{Average Salary Cost} \\ \text{per Student-} \\ \text{Credit-Hour} \end{array} = \frac{\text{Average Instructional Salary}}{\text{Average Credit-} \\ \text{Hours of Teaching} \times \text{Average Section} \\ \text{Size}}$$

The relationship of the instructional cost factors expressed in the above equations raises significant policy or management questions relating to the effective allocation of resources and the achievement of educational quality.⁹ The inter-relatedness of these cost factors also provides a means of analyzing the three different budget approaches described earlier.

It is perhaps obvious that the use of any kind of budget format which attempts to provide for systematic analysis of budget needs tends

⁹Stanley Ikenberry, "Instructional Cost and Quality," College and University, Spring, 1962, pp. 242-250.

to impose a certain degree of standardization. Whereas some standardization is desirable and necessary for greater equity in the allocation of resources, a certain amount of flexibility, or freedom to innovate, is necessary in the effective management of those resources. Consequently, it may be well to note some of the differences in the three budget approaches in terms of the degree of standardization imposed, or conversely, the flexibility permitted each instructional unit.

In the case of the Florida budget procedure, the major policy question concerns the most appropriate level of SCH productivity and the desired faculty-mix. The next cost factor to be determined is that of the appropriate average salary level for each type of institution. Once these factors have been determined, the average SCH cost is established and will vary only with the fluctuation in enrollments due to errors of prediction. It should be noted, however, that the SCH productivity approach permits the individual institution to modify the average teaching load and average section size, so long as the prescribed productivity rate is achieved.

With the California procedure, on the other hand, much greater control over the last two cost factors is imposed by the faculty staffing formula; also, the state-wide faculty rank distribution and central control over salary scales, tends to structure each institution's personnel and salary administration along standard lines. The only cost variable over which an institution can exercise some administrative action is in the area of average section size, which is determined

by the particular student and course mix. But, if the institution elects to modify its instructional practice to the extent that it deviates appreciably from the standard classification scheme, it is likely that the courses involved will be re-classified in order to reduce any budgetary advantages that may have been gained from such innovations.

By way of contrast, the Indiana unit cost approach allows a much greater degree of flexibility in the management of each institution, so long as the overall cost relationship is achieved. As noted earlier, the budgeting of instructional operations on the basis of a rate per SCH permits the academic administrator to determine that combination of average salary and average SCH productivity per FTE faculty member which is most appropriate to a given instructional unit. Once the average salary level is determined, the particular faculty rank and salary mix required to achieve that average may be ascertained. Similarly, questions relating to the average teaching load and the average section size may be answered in light of the productivity rate to be achieved and the various other demands being made on the instructional unit.

Although each of the three state-wide procedures has as its primary objective the determination of the total financial support necessary to carry out the various educational programs of an institution, each method appears capable of making a much greater contribution to effective educational management than it may have been given credit for. Both the California and Florida procedures emphasize

staffing considerations which should be of prime concern to administrators in both day-to-day operations and in long-range planning. In addition, the California approach also includes much of the required ground-work associated with the scheduling of courses, sections, and facilities. And, in spite of the fact that the Indiana procedure is concerned chiefly with financial needs, the cost analyses upon which the budget procedure is based yield a great quantity of data which could be of considerable benefit to the management of educational operations. Thus, in spite of the limitations imposed on these procedures relative to their use in budget preparation only, it would appear that the various approaches, or certain aspects thereof, applied in an intelligent manner to internal budget considerations, might very well extend the utility of objective budget concepts in a highly significant direction.

Summary

Three distinct approaches to objective budget preparation and review are illustrated by the procedures developed for the rather diverse systems of publicly supported higher education in such states as Florida, California, and Indiana. The formula type procedure adopted by Florida and California have their roots in earlier application of the concept of student-faculty ratios. However, the two procedures differ considerably in that the Florida approach imposes a model based on institution-wide averages determined for selected instructional levels, while the California procedure focuses upon the

staffing requirements of each individual course, as determined by a particular combination of course and student mixes. The Indiana cost analysis procedure, on the other hand, differs markedly from the other two approaches in that it is concerned entirely with the cost implications of student enrollments at the various instructional levels.

The similarity of inter- and intra-institutional budget considerations suggests the possibility that such objective budget procedures may have some utility in the budgeting of internal operations, particularly in the budget category: Instruction and Departmental Research. Thus, Chapter IV will discuss the implications of applying each of these three state-wide budget procedures to the internal budgeting of academic departments of Michigan State University.

CHAPTER IV

APPLICATION OF OBJECTIVE BUDGET PROCEDURES TO THE INTERNAL BUDGETING OF ACADEMIC DEPARTMENTS

General Considerations

Budget formulas and cost analyses have been employed with reasonable success in a number of states to obtain more adequate support and greater equity in the distribution of funds to various types of public colleges and universities supported by a state. To allay fears of greater external control of institutional operations through the mis-use of formula derived budgets, however, there has been a general agreement that such objective budget procedures are to be used for budget preparation and review purposes only. Considering the extent to which research data have been mis-used on occasion by well-meaning but un-informed or partly informed administrative officials, some authorities in the area of educational administration and finance have even discouraged the use of objective budget procedures in the internal management of institutions.¹

¹John Dale Russell, in Yardsticks and Formulas in University Budgeting, p. 68; James Doi, "The Proper Use of Faculty Load Studies," in Studies of College Faculty. (Boulder: Western Interstate Commission on Higher Education, 1961), pp. 55-57; and John M. Evans and

Nevertheless, the problems of effective resource allocation within an institution are of such importance to everyone concerned that efforts to discover some of the proper or appropriate uses of objective data and/or procedures in the budgeting of academic departments might prove highly beneficial and possibly serve to counter some of the mis-application of research or operational data in the future. Moreover, the fact that each of the major objective budget procedures utilized by the various states focuses upon the instructional program as the primary determinant of budgetary need suggests that the operating units most closely associated with the instructional program might well be the most appropriate level for applying objective budget procedures. This would permit a return to the principle that budgets should be built from the bottom up, rather than from the top down.²

In spite of the wide variations in budget procedures illustrated by the major approaches outlined in Chapter III, and in spite of the general lack of consensus as to the most important factors or considerations in academic budgeting, an inspection of the basic elements of each procedure reveals nothing to suggest that an objective approach is totally unsuited to the internal allocation of institutional resources. On

John W. Hicks, Studies in Higher Education, Vol. XCI: An Approach to Higher Educational Cost Analysis (Lafayette: Division of Educational Reference, Purdue University, 1961), p. 26.

² Thomas E. Glaze, Business Administration for Colleges and Universities (Baton Rouge: Louisiana State University Press, 1962), p. 129.

the contrary, the very fact that some of these procedures are designed to focus attention on key policy questions is an indication that decisions relating to operational budgets should have a comparable focus.

Regardless of the kind of budgetary approach followed --be it laissez-faire or objective -- key policy decisions are made -- consciously or unconsciously. In the final analysis, therefore, the soundness of all policy decisions depends upon the quality of judgment exercised by responsible administrators. On such officials rests the responsibility for determining the proper, or most appropriate relationship of the various educational cost factors at the operating level in accordance with the expected contribution of each department to the achievement of the overall objectives of the institution.

The basic danger in the application of formula or cost analysis procedures to departmental budget considerations is that inappropriate standards or performance expectations may be imposed. Certainly, arbitrary and insensitive measures might be imposed on departmental budget requests which could have a crippling effect on some of the programs and activities that an institution might be attempting to carry out. In this respect, the individual department is typically concerned with the possibility of budgetary reductions; from the point-of-view of the institution, however, the major concern is that inappropriate measures of budgetary need might lead to over-nourishment of some departments and corresponding under-nourishment of others. In spite of the possibility of applying the wrong performance

standards or related budget measures in an objective budget procedure, there is little or no reason to suspect that the quality of the judgment exercised by the same officials would be any better under a traditional budget approach.

One of the major objections to formula or cost analysis budget procedures appears to be the fact that such approaches employ averages and other statistical data as a form of fiscal shorthand in order to project budget needs on a factorial basis. A general concern over the use of averages with academic departments is that the practice is likely to result in a leveling of all departments to a standard of mediocrity.³ Although certain averages might be used as norms in an objective budget approach, there appears to be no reason to assume that such procedures are entirely dependent upon the use of institution-wide averages if applied at the operating level.

Consequently, to gain a better understanding of the feasibility of, or relative contribution of formula or cost analysis procedures to the budgeting of academic departments, three different budget approaches similar to those used in the three state plans were applied to a number of departments of Michigan State University. Also, to provide an empirical basis upon which to judge the results of applying various types of normative data, three sets of weighted averages, covering a variety of factors, were developed for use with each procedure. The weighted

³ Logan Wilson, "Analyzing and Evaluating Costs in Higher Education," Educational Record, April, 1961, p. 102.

averages or "norms" were based on the performance and other characteristics of 1) individual departments, 2) two groups of departments having similar instructional patterns, and 3) the combined group of departments having mixed instructional patterns. For the two procedures which base budget projections on staffing data, additional budget estimates were made using current salary data pertaining to 1) the departments selected for the study, 2) the colleges represented by the selected departments, and 3) the entire university. Alternate budget projections using regression analysis were developed from group and combined group historical data, to take into account the relationship of cost to the size of a department's enrollment.

Figure 1 charts the various combinations of procedures and norms applied to each of the academic departments, along with the factors to be considered in subsequent analyses. In each combination, certain variables are held constant to provide a measure of the differences among procedures or in other variables. For example, the objective budget methods were compared by applying departmental norms throughout each procedure; the differences due to group and combined group averages pertaining to staffing ratios (i. e. regular faculty, graduate-assistants, and clerical and technical personnel) were determined by applying a constant workload and FTE salary under the course classification approach.

Fig. 1. -- Combinations of objective budget procedures and normative data applied to selected academic departments

Procedure	Norms*	Norms	Norms	Variable
Cost Analysis (Indiana)	C ₁	-----C ₂	-----C ₃	Unit Costs
SCH Productivity (Florida)	X ₁ Y ₁ Z ₁	---X ₂ Y ₂ Z ₁ ---X ₃ Y ₃ Z ₁ ---	---	Product. Norms
		X ₁ Y ₁ Z ₂ ---X ₁ Y ₁ Z ₃ ---	---	Salary Norms
Course Classification (California)	X ₁ Y ₁ Z ₁	---X ₁ Y ₂ Z ₁ ---X ₁ Y ₃ Z ₁ ---	---	Staffing Norms
		X ₁ Y ₁ Z ₂ ---X ₁ Y ₁ Z ₃ ---	---	Salary Norms
Variable	Budget Method			

* C = Average Instructional Unit Cost
 X = Productivity or Student-Faculty Ratio
 Y = Staffing Ratios -- Graduate-Assistant,
 Clerical, etc. **
 Z = Average Salaries

Subscripts:
 1 = Departmental
 2 = Group/College
 3 = Combined
 Group/University

** Includes Research, Public Service, and Admin. FTE
 under the SCH Productivity Approach

Selection of Departments used in the Study

The departments included in the study are found in all major universities. They were selected on the basis of both similarities and differences. Although they vary considerably in size, each provides instruction of a service nature as well as advanced courses for departmental majors. Each department offers both undergraduate and graduate instruction -- leading to the doctorate. However, the departments also fall naturally into two groups which characterize laboratory and non-laboratory type instruction.

The relative similarity of these departments was also pointed up by the fact that, with one exception, all of the instructional units had been affiliated with the College of Science and Arts prior to its reorganization into three separate colleges at the beginning of the 1962-63 fiscal year. Following this re-organization, three of the departments were assigned to the College of Arts and Letters, seven to the College of Natural Science, and four to the College of Social Science. The remaining department, formerly administered by the College of Business, was assigned to the College of Social Science during the years 1962-64, but was subsequently transferred back to the College of Business. Because of its natural relationship to the social sciences, however, it was retained in the study.

Comparable data on any selected group of departments is difficult to get over any length of time. This is illustrated by the fact

that one of the social science departments was divided into two separate administrative units at the beginning of the 1964-65 fiscal year. Because of the relatively small size of the newest department and the difficulty in separating previous data, the two units have been treated as one department. In addition, a new unit was created in 1964 to take over the lower division service courses of two of the natural science departments included in the study.

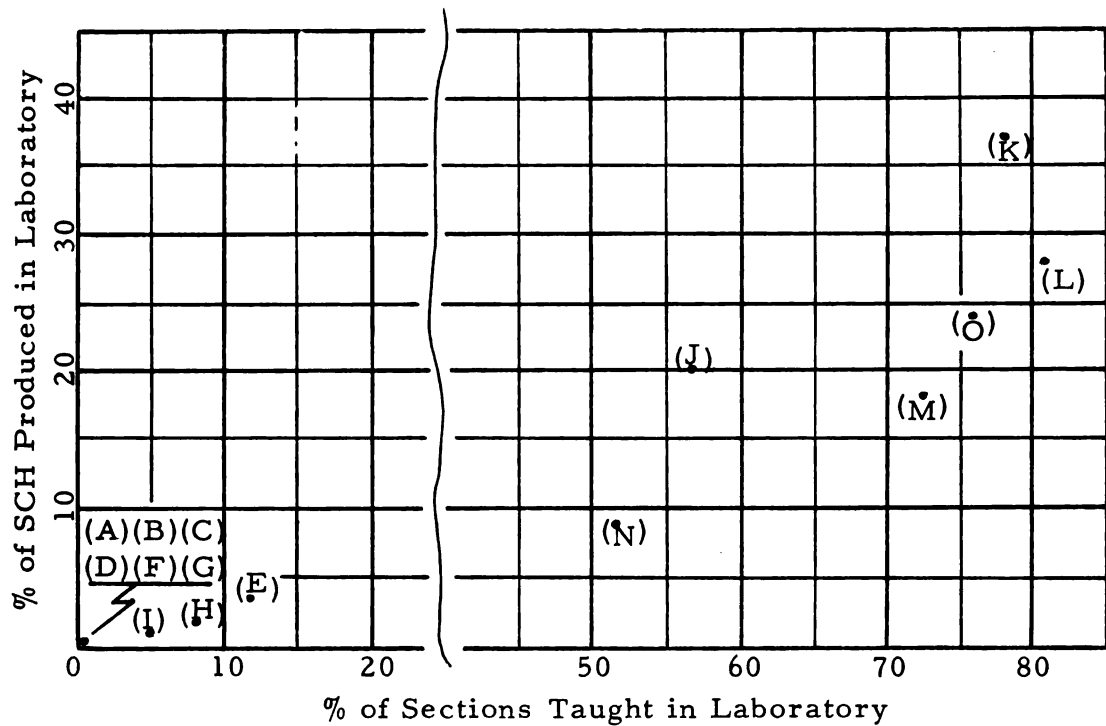
Grouping of the Departments for Comparison

The 15 departments selected for the study were divided into two groups to facilitate comparison of departmental operations with those of similar instructional units and to provide normative data based on comparable programs. Although academic departments might be grouped on a variety of characteristics, the distinction between laboratory and non-laboratory instruction is essential for an analysis of workloads, productivity, etc., since the issue of credit-hours vs. contact-hours as appropriate measures of workload becomes rather acute with these two instructional patterns.

Because of their common reliance upon a lecture-discussion approach to their instructional programs, nine of the departments (including the departments in the Colleges of Arts and Letters and Social Science) were designated as Group I departments; the remaining six departments were designated as Group II because of their common use of laboratory experiences in the greater part of their instructional

offerings. Fig. 2 charts the position of each department with respect to its proportion of Fall quarter class sections taught in laboratory-type instruction and the proportion of total departmental student-credit hours produced in laboratory sections.⁴

Fig. 2. -- Classification of laboratory and non-laboratory academic departments



Source and Development of Normative Data

Historical data on the selected departments were extracted from various documents prepared by the Office of Institutional Research

⁴Section Size Analysis, Fall Term(s) 1962-65 (East Lansing: Office of Institutional Research, Michigan State University, June, 1963, 1964, 1965).

(OIR) at Michigan State University for the years, 1962-65. Data on instructional unit costs were taken from cost study reports of the Michigan Council of State College Presidents, or from data collected by OIR for use therein. Some of the historical and statistical data derived therefrom relative to the departmental characteristics or operational patterns of the departments included in the study are presented in Tables 1-a through 6-b of Appendix B. Where possible, a three year weighted average of the operational years, 1962-65 has been computed as follows:

$$\text{Wtd. Avg.} = \frac{3A + 2B + C}{6}$$
 where "A" represents the most recent year, "B" the next most recent year, etc.

The use of three years' data provides a more realistic estimate of a department's operations than that portrayed by a single year. And, by weighting the data as indicated above, the influence of recent operations is given primary emphasis to account for any trends that may be developing. The weighted average is also useful in the projection of long-range workload.⁵

The various data used with objective budget procedures typically represent only one segment of an academic year -- generally the Fall Quarter or Semester. The primary reason for this is that the

⁵Elwin F. Cammack, "A Projection of Student Credit Hours by Department, for 1967-68 and 1972-73" (East Lansing: Office of Institutional Research, Michigan State University, November, 1963), (Mimeographed).

budget calendar seldom allows time for the compilation of complete full-year data on the most recent year's operation. Thus, estimates are generally based on Fall data, under the assumption that the resources which are adequate for that term will prove adequate for subsequent academic periods. It is generally also assumed that departments will endeavor to equalize the workloads among the various terms of the academic year.

Departmental Volume, Productivity and Staffing Data

Since both formula procedures employed in the study are based upon Fall data, most of the material presented in the tables in Appendix B represent the Fall Quarter of each academic year. Table 1-a, for example, presents the weighted average (SCH) instructional load of each department during the Fall Quarters of 1962-65; Table 1-b presents the same instructional load, expressed as FTE Students. Similar SCH data for the regular academic year are presented in Table 1-c along with an index figure which represents the proportion of the three-term student-credit-hours which are produced during the Fall Quarter. Although the departments average a little over one third of their SCH production during the Fall, it will be noted that certain departments experience a considerably heavier load during that period, due to the heavy enrollment in certain of their lower division service courses and/ or the fairly heavy attrition involved.

The proportion of student-credit-hours produced at each level,

shown in Table 1-d , provides a clue to the nature of a department's instructional program as well as an indication of the probable cost picture. In other words, the department which produces a large proportion of its student credit hours at the freshman and sophomore level and correspondingly few SCH at the graduate level may be expected to have larger sections, lower salary costs per student credit hour, and relatively fewer faculty members than a department which has the same total SCH volume but which conducts the major portion of its instructional program at the upper division or graduate levels.⁶

The chief determinant of departmental budget requirements is the overall size of the academic staff which is predicated on the functions to be performed, or the manner in which faculty resources are employed. Table 2-a presents the three year weighted averages of each department relative to the number of FTE faculty assigned to each of the functions performed by academic departments at Michigan State University. As defined in the Faculty Time Distribution Report(s) from which these data were extracted, a full-time-equivalent position is one in which a staff member received 100 % of the salary prescribed

⁶The University College at Michigan State University presents an example of relatively low-cost instruction attained through "efficient" scheduling of very large enrollments. While enrollment patterns at the various student levels generally produce higher unit costs at the more advanced levels, it is interesting to note that one of the departments of the study which happens to produce an unusually large percentage of upper division student-credit-hours actually shows a lower unit cost at the upper division than it has at the lower level.

for a given period according to the annual rate of the appointment.⁷

In other words, a staff member receiving only half of the rate prescribed for a given term would be reported as a 0.50 FTE by the employing department.

As defined in OIR data, two graduate-assistant appointments constitute an FTE faculty position. In the absence of such staffing data in departmental budget records, the number of graduate-assistant FTE positions allocated to each department of the study was determined by dividing the total sum listed in the annual budget for such positions by the FTE salary of \$4,800. It should be noted, however, that the actual number of graduate assistants employed at any one time may vary considerably from the annual FTE positions shown in Table 2-a. Nevertheless, it was necessary in subsequent budget projections that the annual relationship of graduate-assistant and regular academic positions be maintained in order to present the most realistic picture of departmental staffing needs.

Table 2-b presents the distribution of faculty time among the various functions of each department, expressed as a ratio of the number of FTE faculty positions in instruction to each FTE position in research, professional service, etc., along with the proportion of total

⁷No distinction is made between 10 and 12 month appointments in Office of Institutional Research data at present. However, for the particular departments of the study, there were few 12 month faculty appointments other than those of department chairman.

academic positions filled by graduate-assistants and the ratio of clerical personnel to regular academic positions.

The relationship of instructional volume to the size of staff is often expressed in terms of a student-faculty ratio or as an instructional productivity rate which represents the average number of student-credit-hours to be produced per FTE faculty member. Table 3 presents the weighted average productivity rates and student-faculty ratios covering both the instructional faculty and the total faculty of each department during the period, 1962-65.

Departmental Cost Data Lacking comparable unit cost data for the three-year period included in the study, the weighted average salary cost per student-credit-hour (all levels) was estimated for each department and group from the budget data presented in Table 4 by dividing the combined academic and clerical salaries by the weighted average SCH for the same period. Similar treatment of the labor, supplies and services, and equipment allocations produced estimates of the weighted average operating costs per SCH.

Additional estimates of the instructional unit costs by student level were derived from the weighted average unit cost data by applying established relative cost figures to the particular student mix of each department and group.⁸ Upon determining the average unit costs for

⁸ "Unit Cost Study: Instruction and Departmental Research, 1963-64," Michigan Council of State College Presidents. (Lansing: MCSCP, June 1965), (Mimeographed); "relative costs" are determined

each group and the combined group of departments by student level, these cost rates were then applied to the corresponding proportion of SCH produced at each level to derive the weighted average unit cost for each department under different normative classifications.

Unit costs by student level for salaries and operating expenses are presented in Tables 5-a and 6-a; weighted average costs per SCH developed for subsequent budget projections, are presented in Tables 5-b and 6-b.

Application of Objective Budget Procedures

The Cost Analysis Approach

Once the necessary cost data on past operations have been obtained, the cost analysis approach provides a simple and direct method of estimating total budget requirements of an organization or activity. This method involves the projection of probable workload in appropriate units and the subsequent application of the corresponding cost per unit, adjusted as required for anticipated changes in price or salary levels of the various cost

by dividing upper division or graduate level costs by lower division unit costs; "average unit cost" refers to the overall unit cost of all student-credit-hours generated by a department; the contribution of each instructional cost level to the average unit cost may be determined by the equation:

$C_a = c_1P_1 + c_2P_2 + c_3P_3 + c_4P_4$, where c = unit cost by level and p = proportion of SCH at each level; average relative cost follows a similar relationship:

$C_r = r_1P_1 + r_2P_2 + r_3P_3 + r_4P_4$, where r = relative cost by student level.

Then: $C_a/C_r = c_1$, $c_2 = c_1r_2$, $c_3 = c_1r_3$, etc.

factors involved. The product of the projected work volume and the cost per unit provides an overall estimate of budget requirements for a given category such as salaries, operating expenses, or total budget.

Utilizing 1965-66 enrollment estimates of instructional unit costs based on departmental, group, and combined group data (Table 1-e) three sets of budget projections were calculated for each department and are presented in Tables 7-a and 7-b of Appendix C. Table 7-c presents supplementary projections based on regression analysis of group and combined group data.

Although the salaries and operating expense budgets would normally be combined to determine total departmental budget requirements, the two categories were kept separate for subsequent analyses. As indicated in Chapter III, the Florida and Indiana budget procedures both employ the cost approach in the projection of operating expense; the California procedure considers individual requests based on historical trends, which is similar to the cost approach. Thus, the major differences among the three budget procedures occur in the area of staffing and/or salaries budgets, rather than with the overall budget procedure.

The SCH Productivity Approach As previously indicated, the productivity approach employs a series of steps which first provide estimates of the various departmental cost factors required for a given instructional volume and then applies appropriate dollar values on each element to arrive at the total budget needs. Because faculty and staff

salaries constitute the major portion of the typical academic budget, the major effort under the SCH productivity approach is directed toward the calculation of the number of staff members required to handle the anticipated volume of instruction, given certain levels of SCH productivity. The number of positions or the proportion of total staff time which can be assigned to other departmental functions such as research, professional service, or administrative and committee work are then related to the size of the teaching staff.

Utilizing actual Fall '65 student-credit-hour data as the instructional volume and the weighted average SCH productivity rates established for each department, group, and combined group, three different estimates of the teaching staff requirements were obtained for each department. Then, to determine the number of additional staff positions to be allocated to the other academic functions of each department, the three corresponding sets of staffing ratios obtained previously were applied to the three teaching staff estimates. The subtotal of the teaching, research, and professional service FTE positions then served as a base for determining the number of administrative positions required. The projection of clerical personnel requirements was similarly derived by applying the appropriate ratios to the estimated number of regular faculty positions.⁹ The results of these staffing

⁹ The Florida procedure relates clerical FTE to the total academic FTE staff. However, to insure that the budget projections for the selected departments would approximate the existing situation, the number of regular FTE faculty positions was used as a base for

estimates are presented in Tables 8-2, 8-b, and 8-c.

It will be noted that the total faculty requirements derived from the three sets of weighted average productivity rates tend to increase as group heterogeneity increases. The application of average productivity rates of like departments generally favors the larger departments which generally have productivity levels that exceed the group mean; thus, when the mean productivity rate is applied to the high volume of the larger departments, additional positions are indicated. By the same token, the mean productivity rate for the combined group of laboratory and non-laboratory departments is considerably lower than the actual productivity rates of the larger departments, regardless of the type of programs. Once again, the mean productivity rate, when applied to a large volume, calls for more teaching staff members than suggested by either the departmental or group norms.

As indicated in Table 8-d, the application of regression analysis in the determination of total FTE faculty requirements results in a more equitable distribution of faculty resources among large and small departments. In contrast to the results of average productivity rates, the total FTE faculty requirements actually decline under the

estimating clerical positions. Product moment correlations of actual staffing patterns of the 15 departments indicate a much greater relationship between regular faculty and clerical personnel ($r. = .60$) than between total academic and clerical personnel ($r. = .14$).

regression approach.

Following the development of staffing requirements, average salary data for 1965-66 on each department, the three colleges represented in the study, and the entire university, were then applied to each of the projected number of FTE positions in each category of academic and clerical personnel to determine the financial support needed under the various staffing and salary combinations. The resulting budget projections for personal services are presented in Tables 9a and 9b.

The Course Classification Approach Unlike the previous approaches, which employ gross performance or workload data relating to relatively broad segments of the instructional program, the course classification procedure recognizes the budgetary implications of curricular offerings at the level of the individual course. Assuming a relatively even distribution of course offerings throughout the year, each authorized course which is normally offered during the Fall term is classified according to the nature of the course -- the objectives, methodology, etc. Each classification suggests an optimum section size and the corresponding cut-off points at which student enrollments dictate the scheduling of additional sections.

The classification of courses, under the California Staffing Formula, gives primary emphasis to instructional arrangements or methodology, such as lecture, lecture-discussion, seminar, and

various types of laboratory or activity experiences. Each classification imposes a certain weight upon the number of credits awarded for each course (section), to account for differences in contact hours and credits of teaching among different types of instructional programs.¹⁰

With the California classification scheme as a guide, each of some 700 fixed credit courses taught by the 15 departments of the study was assigned a classification which most nearly approximated the manner in which the course had been conducted during the past three years. Where decided changes had occurred during the period, however, the most recent instructional pattern was used as the basis for classifying a course. The prescribed cut-off points associated with each classification were then applied to the actual course enrollments for the Fall Quarter, 1965, to determine the number of required sections for each course.

The number of FTE faculty required to handle each department's fixed-credit course load was then determined from the total weighted units of teaching required for the number of sections estimated. A standard number of teaching units per FTE faculty member was then divided into the total units of teaching required to derive the instructional FTE required by each department. In each of the California State Colleges, the standard teaching load is 12 units. Allowing for the increased emphasis placed on departmental research in an institution such as Michigan State University, an arbitrary standard

¹⁰Miller, op. cit., pp. 174-186.

teaching load of 9 units was applied to the departmental course-load to allow 25 % of the average faculty assignment to be devoted to departmental research.¹¹ However, the resulting staffing estimates produced a total complement which fell short of the actual 1965-66 budgeted positions and projected FTE positions derived by the SCH productivity method; thus, the standard teaching load was reduced to 7.25 units to allow for more realistic comparison of the three budget approaches. To provide additional comparative budget projections based on regular credits of teaching instead of weighted credits (units) a standard (mean) teaching load of 6.29 credits was divided into the total credits of teaching required for the number of projected sections to be offered by each department.

The California standards pertaining to independent study and research type courses, which specify student-faculty ratios of 36:1 and 25:1 at the undergraduate and graduate levels, were applied to all Independent Study/Variable Credit course enrollments (IND/VAR) of each department in the calculation of total FTE faculty requirements.

Because the classification of fixed-credit courses was based upon actual practice, the number of sections and the corresponding teaching units projected for each department approximated the actual registration pattern for the Fall Quarter, 1965. In the area of IND/VAR

¹¹ Since the time distribution data of Table 2-a show approximately 77-79 % of the total faculty time devoted to instruction, this approximation of a standard faculty load appeared reasonable.

courses, however, the application of student-faculty ratios resulted in a marked variation from existing practice.

In accordance with state-wide cost study definitions, Michigan State University expresses IND/VAR workload as the average number of credits carried by the students enrolled with a given instructor under a separate section number. For example, a variable credit course enrolling 6 students for a total of 27 student-credit-hours would credit the instructor involved with 4.5 credits of teaching for the course. By the same token, the instructor who supervises one student in an independent study or research project is reported as teaching the same number of credits as the student has enrolled for -- which also happens to be the average credits carried. It is entirely possible, therefore, to show a faculty member as teaching 18-20 credits or more, when in fact his total teaching load may be limited to supervising only 3-5 students who happen to be enrolled under different course numbers. Such wide variation in the actual workload represented by the average credits carried in IND/VAR courses in turn creates an erroneous picture of the actual teaching loads of an individual staff member or department.

The application of the course classification procedure results in a single estimate of the total faculty requirements of a department, given a standard teaching load, the specific course offerings and their classifications, and the particular enrollments projected for a specific quarter. Nevertheless, the actual financial support required may be varied considerably according to policy decisions relative to the

distribution of faculty ranks, the relationships of average faculty salaries from rank to rank, the extent to which temporary faculty or graduate-assistants are utilized in the instructional program, and the level of clerical and technical support to be provided.

Since the majority of the California State Colleges are basically undergraduate institutions, the California staffing formula makes no specific allowance for graduate-assistant type teaching positions. Consequently, to make the results of the course classification approach comparable to the unit cost and SCH productivity approaches, the three sets of ratios employed in the SCH productivity procedure were applied to the staffing estimates derived under the California system to determine the number of regular faculty, graduate-assistants, and clerical personnel for each department.

A breakdown of the number of teaching units required under each course classification is presented for each department in Table 10-a of Appendix C; the related academic staff requirements are presented in Table 10-b. Academic staff requirements based on credits-of-teaching are presented in Table 10-c. The application of departmental, college, and all-university salary averages to each personnel classification provided several budget combinations for comparison with budget projections derived from the other budget approaches. The result of eight such combinations are presented in Tables 11-a and 11-b.

Summary

Historical data on 15 selected academic departments of Michigan State University were applied to 3 different objective budget procedures employed in state-wide budgeting to provide a basis for comparison of the alternate procedures and an analysis of the implications of their use in internal budgeting. Various staffing and budget estimates, based on instructional volume recorded for the Fall Quarter, 1965, were derived from the application of departmental and group averages pertaining to such factors as instructional unit costs, SCH productivity, staffing ratios, etc. The results of the application of the various normative data in each of the budget procedures are presented in Appendix C and will be analyzed in the following chapter.

CHAPTER V

COMPARATIVE ANALYSIS OF ALTERNATE BUDGET PROCEDURES

An analysis of the objective budget procedures examined in this study must take into account a number of factors. First of all, the results obtained from the application of the alternate procedures should be examined from the standpoint of their similarities and differences to determine the extent to which the budget projections reflect or deviate from current practice. Second, since the actual results depend to a great extent on the nature of the normative data utilized in the computations, the underlying assumptions and the influence of various normative standards should be thoroughly examined. Third, the possible contributions of each objective budget procedure to more effective budgeting and management of departmental resources should be considered. Finally, an estimate of the overall utility of objective budget procedures for departmental budgeting must be made in terms of the complexity of the procedures and the relative values derived for the costs incurred.

Analysis of the Results Obtained from the

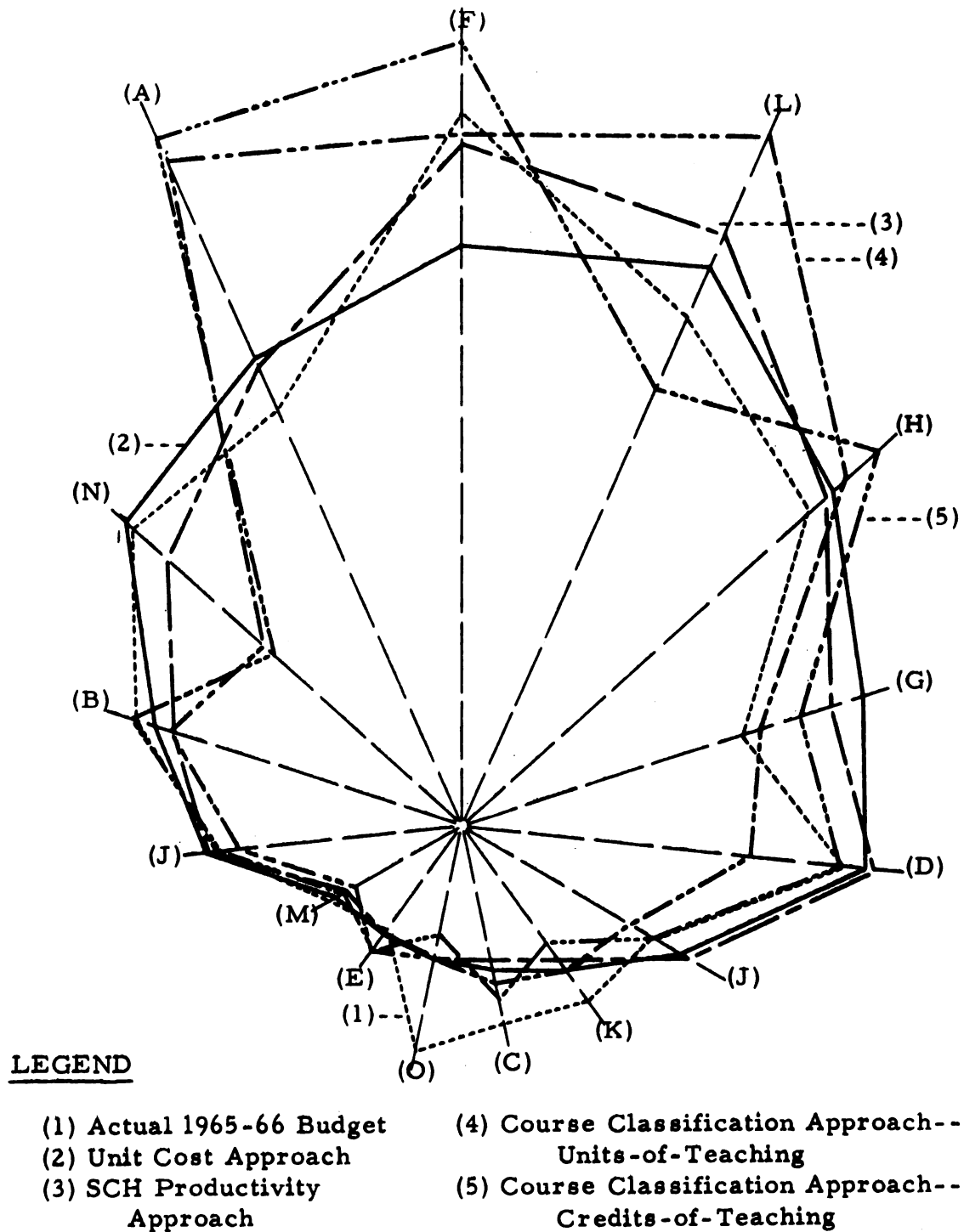
Application of Objective Budget Procedures

The equitable distribution of resources is an ideal toward which all objective procedures are supposedly aimed. However, the elusiveness of such a goal becomes readily apparent upon examining the results of applying the various procedures, for the rather extensive variation in budget projections raises the question of which approach is the most equitable, and ultimately, the question, "What makes a budget allocation equitable?"

As illustrated graphically in Fig. 3, the differences in salary budget projections are rather extensive for certain departments, and in some cases all objective estimates differ appreciably from the actual 1965-66 departmental salary budgets. Each radial line of Fig. 3, (p. 71); represents a department of the study and the level of support allocated by each procedure is represented by the length of the line segment within the closed figures.¹ In each configuration, the total funds available have been adjusted to the actual funding level of the 1965-66 academic

¹Illustrations adapted from Harry Williams, Planning for Effective Resource Allocation in Universities, American Council on Education, Commission on Administrative Affairs (Washington, D. C., 1966), pp. 4-5.

Fig. 3. -- Comparison of departmental budget projections derived from the application of alternate budget procedures with actual 1965-66 budget levels



year.² The resulting budget allocations illustrate the situation faced by the academic administrator who is confronted with the task of dividing up limited resources among highly competitive programs or activities; a decision to increase the support in one area requires a corresponding decrease in certain others. While few departments would quarrel with a possible increase in support, those departments which would stand to have their budgets cut in any way under any or all of the objective approaches could hardly be expected to welcome the adoption of such procedures.

The salary budget projections presented in Fig. 3 resulted from the application of departmental norms to each of the three procedures examined. That is, instructional staff requirements were based on weighted average departmental productivity data, departmental staffing ratios determined the particular faculty mix and the level of clerical support, and departmental average salary data for the 1965-66 academic year were applied to the staffing requirements to derive the total departmental salaries budgets. In the case of the cost approach, weighted average departmental unit costs were used to project total salary requirements

²Budget adjustments were based on the percentage increase or decrease necessary to make budget totals equal actual 1965-66 level. Other adjustment procedures were utilized involving unit-cost rates per SCH and per FETF. While the various adjustments resulted in fairly similar results, the percentage increase or decrease method is the only one in which the shape of the budget configuration remains the same as the original.

The extent of the similarity of each objective budget configuration to the actual 1965-66 allocation pattern is revealed by the general shape of each configuration and by product-moment correlations of .93, .96, and .88 for the cost analysis, SCH productivity, and course classification approaches respectively, when compared to the actual budget distribution. The fact that SCH productivity correlates the highest with actual budget support suggests that some form of student-faculty ratio has apparently been used in conjunction with enrollment estimates in the allocation of departmental budgets during the years covered by the study. In those departments where the actual budget level varied appreciably from all objective budget estimates, much of the difference can be explained by the fact that the actual instructional volume of these departments also differed considerably from expectations based on previous SCH levels.

For example, all SCH estimates of Department (L) fell short of actual SCH volume during the fall of 1965 by some 3,000 student-credit-hours; Department (G) exceeded estimates by at least 900 SCH due to a recent increase in the credit value of all courses from 3 to 5 credits. On the other hand, Departments (C), (K), and (O) experienced a decline in anticipated enrollments amounting to some 800 to 1,800 SCH during the Fall Quarter, 1965.

As might have been expected, the patterns of budget distribution of the cost analysis and SCH productivity approaches are quite similar ($r. = 0.98$). Given the same relationship of cost factors and

the same student mix, the resulting budget projections would be identical. A partial explanation of the differences between the unit-cost and SCH productivity estimates is that different student mixes may be represented in the Fall totals utilized under the productivity approach and the full academic year estimates employed under the cost approach. Also, the instructional unit-cost mix of each department was based on the relative cost patterns reported for the 1963-64 academic year; increased enrollments and possible changes in student mix subsequent to that year may have altered the departmental cost patterns somewhat. At any rate, the major differences seem to occur primarily in the larger departments where any errors of projection are magnified by being spread over a greater number of units.

The budget configurations portrayed in Fig. 3 for the course-classification approach differs considerably from either of the other two objective procedures and from the actual budget distribution pattern. The first of the two sets of course-classification derived estimates followed the exact California procedure which weights certain teaching situations such as laboratory or activity programs according to the contact hours rather than credit hours involved. The second pattern shown in Fig. 3 for the course-classification approach was derived from unweighted credits-of-teaching to provide an indication of the amount of influence laboratory sections have played in the determination of actual departmental budgets.

The configurations of the two sets of budget projections

under the course-classification approach are fairly similar ($r. = .93$). However, the credits-of-teaching allocations tend to resemble some of the patterns obtained when various combined-group normative standards were applied to the other budget procedures, in that the laboratory science departments were consistently penalized while the non-laboratory programs were benefited. Since the California procedure imposes a standard teaching load and, in effect, a standard allowance for all other functions, those departments which tend to place greater emphasis on research and less emphasis on instruction (D)(G)(N), were allocated considerably less support under the California procedure than they received under the other approaches. At the same time, however, Departments (D) and (G) manage to achieve a reasonably high SCH productivity level by employing large lecture sections for much of their instructional programs. Thus, those departments which produce the largest proportion of their SCH in small sections with correspondingly larger teaching loads profited considerably under the California faculty staffing formula.

Therefore, one of the basic issues confronting academic administrators, with respect to the internal application of objective budget procedures, concerns the question of whether input or output is the more appropriate workload to employ for an equitable distribution of resources. The next question to be answered concerns the feasibility of standardizing faculty workload. If the assumption is made that workload is best expressed in terms of a standard number of teaching units

per FTE faculty, then the course-classification approach appears to be suitable.

On the other hand, if it is assumed that the number of students taught, or the number of SCH generated, per FTEF is a more appropriate measure of teaching load, then one of the other objective procedures appears to be in order. In view of the actual budget allocation pattern, it appears that the latter assumption has prevailed in most of the departments of the study. However, in the absence of specified teaching load standards, the different types of departments included in the study may well practice a combination approach which takes into account both credit-hours and contact-hours.

For example one study conducted on M.S.U. teaching loads revealed that faculty members tend to regard both credit-hours and contact-hours as important considerations in the assignment of a percentage of their full time workload. Except in TV or large lecture sections, faculty members listed the number of students enrolled as of secondary importance. Faculty members who had had experience with closed circuit TV instruction generally reported spending considerably more time in preparation than they would have for regular lecture type courses (presumably because of their increased exposure to students and colleagues).³

Thus, the percentage of full-time workload reported for a

³Joseph L. Saupe, "Relationships Among Various Measures of Teaching Load -- From Fall, 1962 Faculty Load Data" (East Lansing: Office of Institutional Research, Michigan State University).

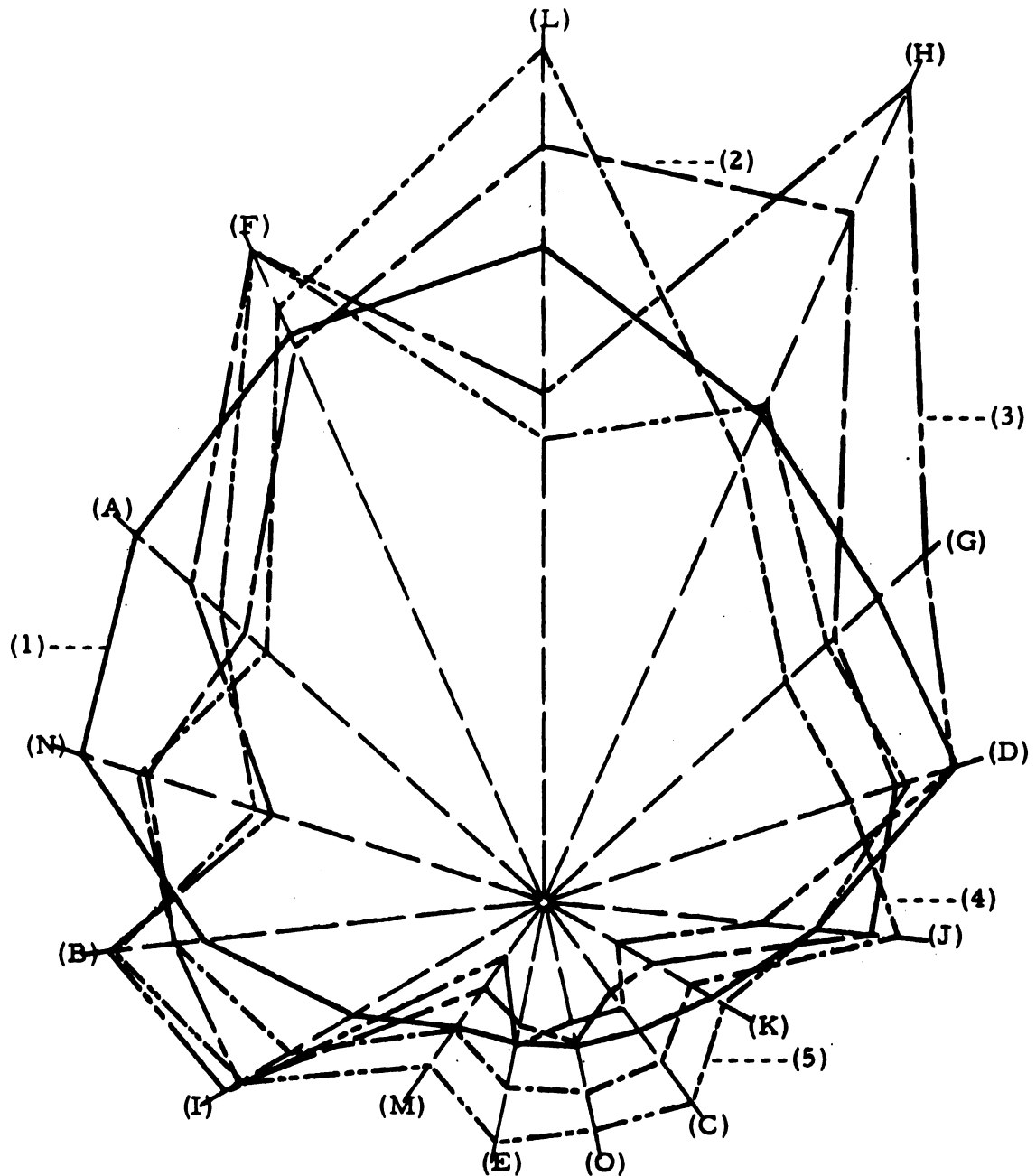
course offering a given number of credits or requiring a certain number of contact hours is likely to reflect a number of factors such as the preparation involved for the initial and subsequent offering of a given course, the preparation and coordination required for multiple sections of the same course, the number of different courses offered in one term requiring individual preparations, the amount of written work or examinations to be read, etc. Some institutions have attempted to work out various weighting schemes to take into account such factors in order to equalize teaching assignments. However, in a major university the size of Michigan State, such a detailed accounting of staff effort involving hundreds of faculty is hardly feasible -- considering the price that would be paid just to achieve uniformity of workload. Moreover, total standardization of workloads, as revealed by some of the budget projections, may not prove to be as appropriate a policy as one might suspect.

Analysis of the Results

of Applying Alternate Normative Standards

Staffing Norms As illustrated in Fig. 4 and Fig. 5, (pp. 78-79), the budget configurations resulting from the use of group or combined group averages are quite similar in the cost and SCH productivity approaches. Under both procedures, the use of group averages pertaining to similar departments resulted in a major shift of funds away from the smaller departments to certain of the larger departments. When

Fig. 4. -- Comparison of departmental budget projections derived from the application of alternate instructional cost norms (unit cost approach and regression analysis)



LEGEND

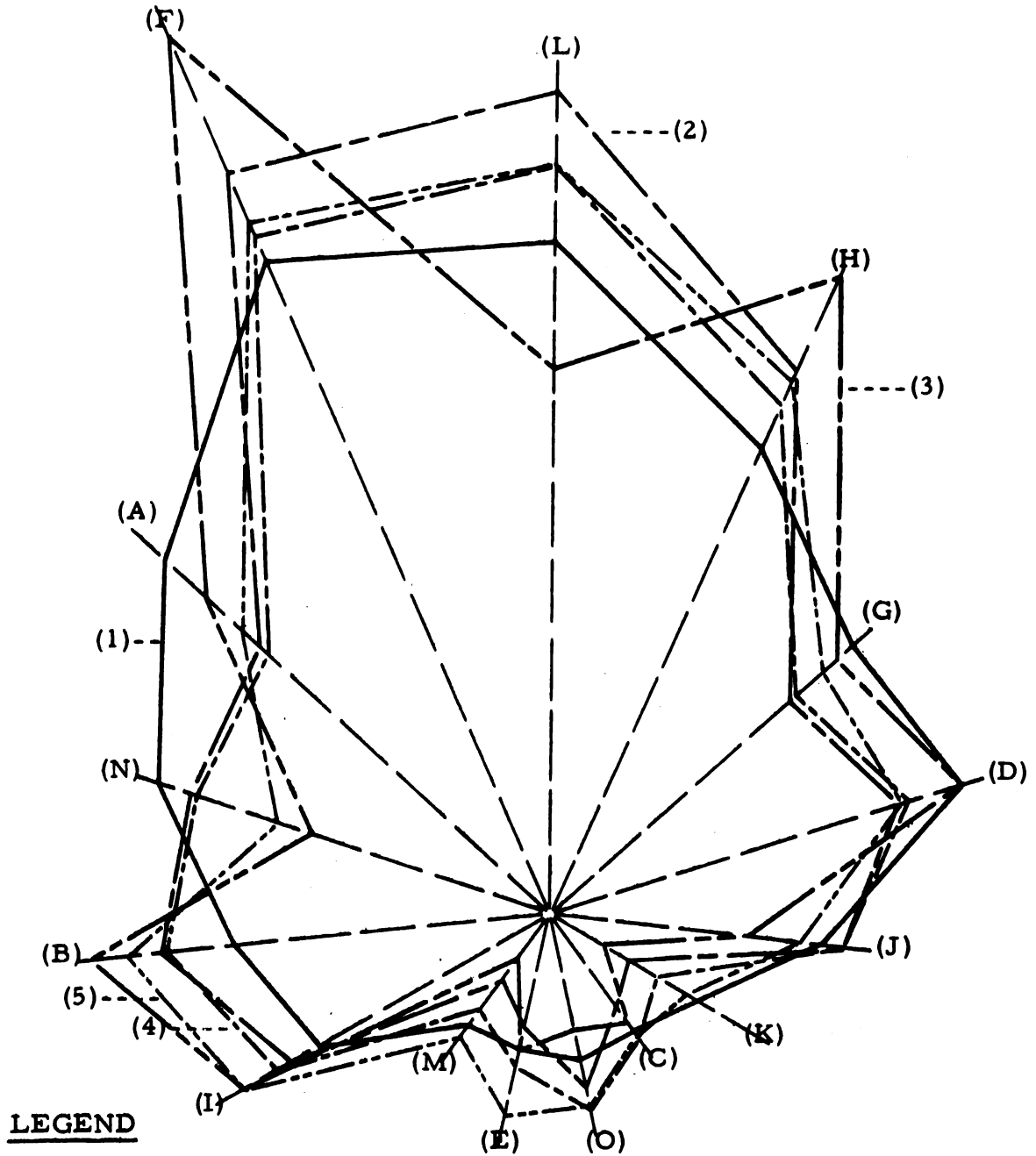
Unit Cost Approach

- (1) Departmental Cost / SCH
- (2) Group Cost / SCH
- (3) Combined Group Cost / SCH

Regression Analysis

- (4) Group Norm
- (5) Combined Group Norm

Fig. 5. -- Comparison of departmental budget projections derived from the application of alternate productivity norms (SCH productivity approach)



LEGEND

SCH Productivity Approach

- (1) Departmental Norms
- (2) Group Norms
- (3) Combined Group Norms

Regression Analysis

- (4) Group Norm
- (5) Combined Group Norm

averages relating to the combined group of departments were applied as normative standards, the shifting of funds became even more necessary. However, in this case, the laboratory science departments, which generally have lower productivity rates and correspondingly higher instructional unit costs, received sizable reductions in their salary budgets, while the social science and humanities departments generally profited from the use of combined group averages. Here again, those departments which produce a large percentage of their student-credit-hours in large sections and/or at a relatively low cost, received the largest increases in budget support.

The use of regression data under both the unit-cost and SCH productivity approaches resulted in allocation patterns which correlated higher with the actual 1965-66 budget pattern than did the corresponding allocations determined on the basis of averages. Under the unit-cost approach the correlation of regression estimates increased from .85 to .87 and from .79 to .90 under group and combined group norms respectively. With the SCH productivity approach, regression data produced budget allocations which correlate the same as average data with actual 1965-66 budget pattern ($r. = .93$ and $.90$). However, under the use of regression data, the effect of size was reduced to the extent that smaller departments received allocations which equaled or exceeded the levels projected under departmental norms.

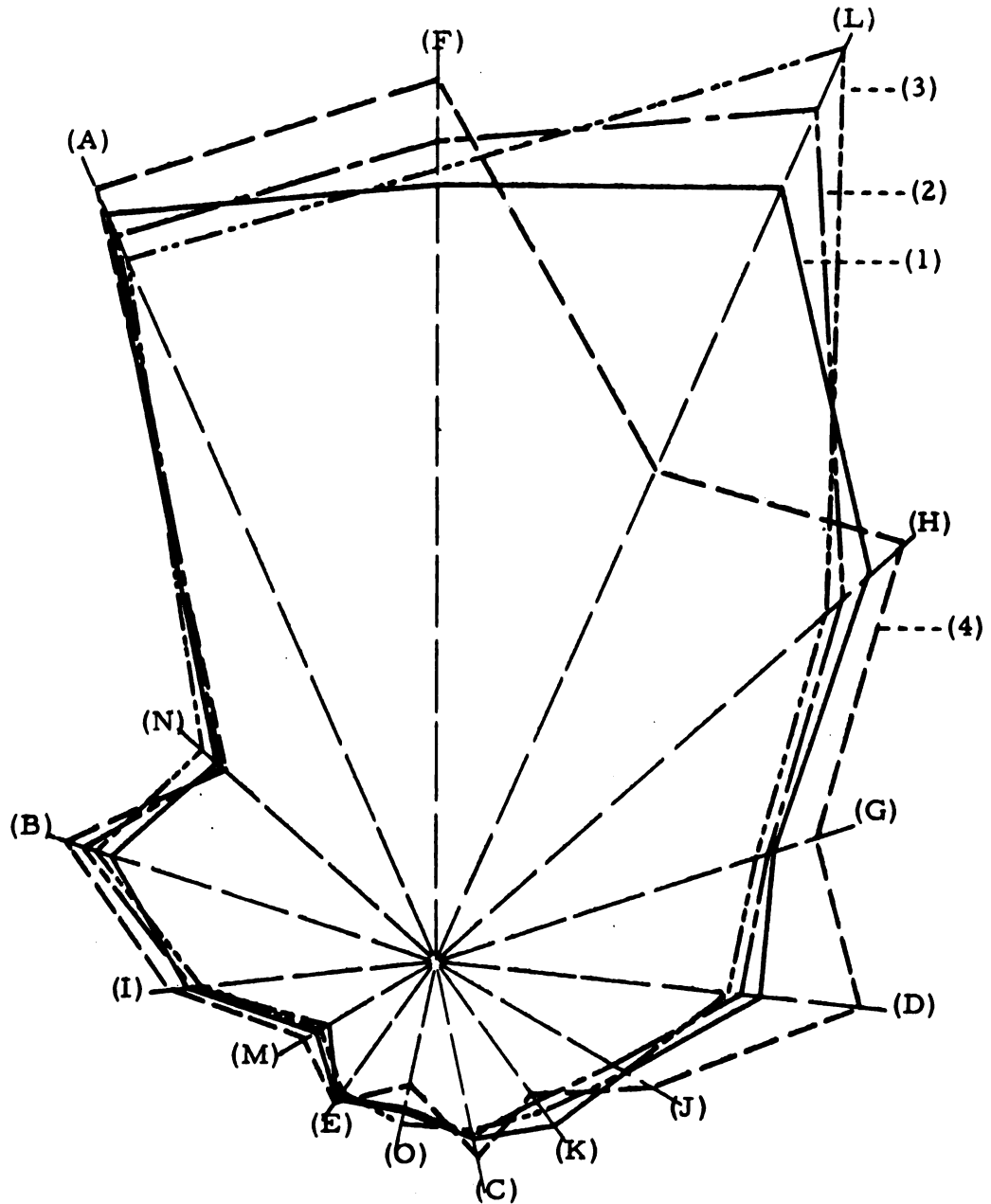
The changes which occur in alternate budget projections when different normative data are applied to the course-classification

approach are illustrated in Fig. 6 (p.82). In this case, the general distribution pattern is not as greatly affected since the teaching load and related functions are already standardized under the California procedure. Once again, the larger departments show the largest variation in budget allocation because any deviation from group or combined group averages becomes magnified when spread over a larger number of faculty positions, etc.

Under each of the objective budget procedures, the most pronounced changes in allocation patterns derived from group or combined group norms occur chiefly in those departments which have shown unusual faculty-mixes, or to a lesser extent, different levels of clerical support. Department (L), for example, employs more than half of its total FTE faculty at the graduate-assistant level -- almost twice the average percentage -- because of its heavy laboratory requirements. Thus, each time a group standard is imposed, Department (L) receives a considerably larger proportion of regular faculty positions, requiring an increase in salary support of some \$6,600 to \$7,200 per FTEF.

Another example of unusual staffing pattern is found in Department (A), which employs one graduate assistant for every 5.9 regular teaching positions -- as contrasted with Department (L)'s ratio of 1.9:1. Thus, Department (A) is consistently penalized under an average ratio derived from group or combined group staffing patterns. At the same time, Department (A) is further penalized for its smaller

Fig. 6. -- Comparison of departmental budget projections derived from the application of alternate staffing norms (course classification approach)



LEGEND

Units-of-Teaching

Credits-of-Teaching

- | | |
|------------------------------------|----------------------------------|
| (1) Departmental Staffing Ratios | (4) Departmental Staffing Ratios |
| (2) Group Staffing Ratios | |
| (3) Combined Group Staffing Ratios | |

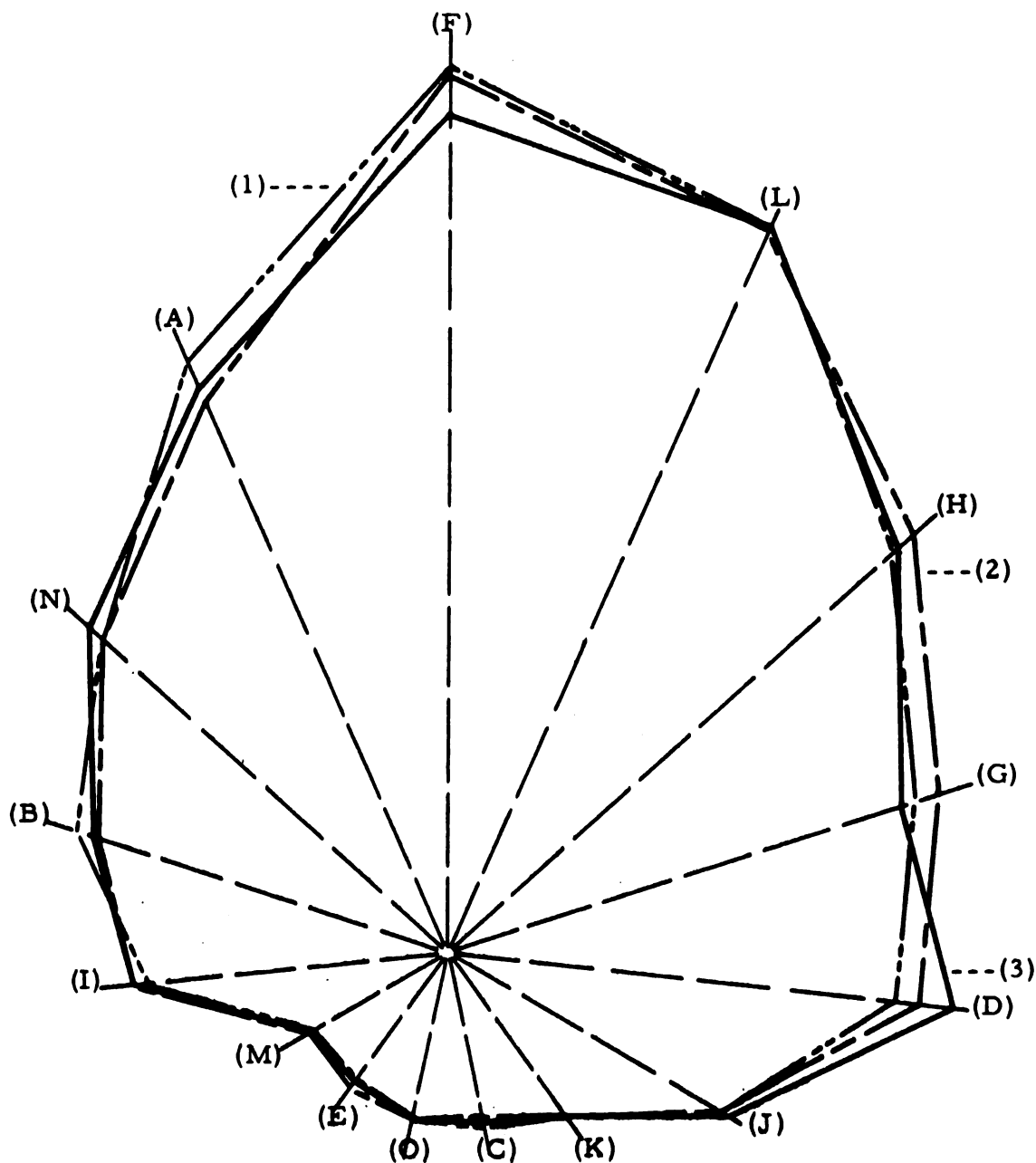
sections and larger teaching loads because of the below average SCH productivity which results; consequently, budget projections are substantially lower under group or combined group staffing norms than they are under the level suggested by departmental averages.

Salary Norms The application of different salary levels based on departmental, college, and all-university averages is illustrated in Fig. 7 (p.84). In about half of the departments, chiefly the smaller ones, the application of different faculty and clerical salary averages makes little difference in the overall salary budgets.

Generally speaking, the larger departments of this study tend to have salary averages which differ somewhat from that of their respective colleges or the all-university salary level -- probably due to differences in faculty rank distribution related to faculty mix.

While it is possible that significant differences in salary levels exist between various departments of the study when examined in detail, it is quite probable that the largest measure of difference is due to variations in faculty mix. In other words, the use of college or all-university salary averages for the ranks of instructor through professor carries with it the assumption that each department's rank and salary distribution is the same as the larger unit. Seldom, however, do departments have the same requirements for faculty members at the various ranks or for the same salary increments within ranks.

Fig. 7. -- Comparison of departmental budget projections derived from the application of alternate salary norms (SCH productivity approach)



LEGEND

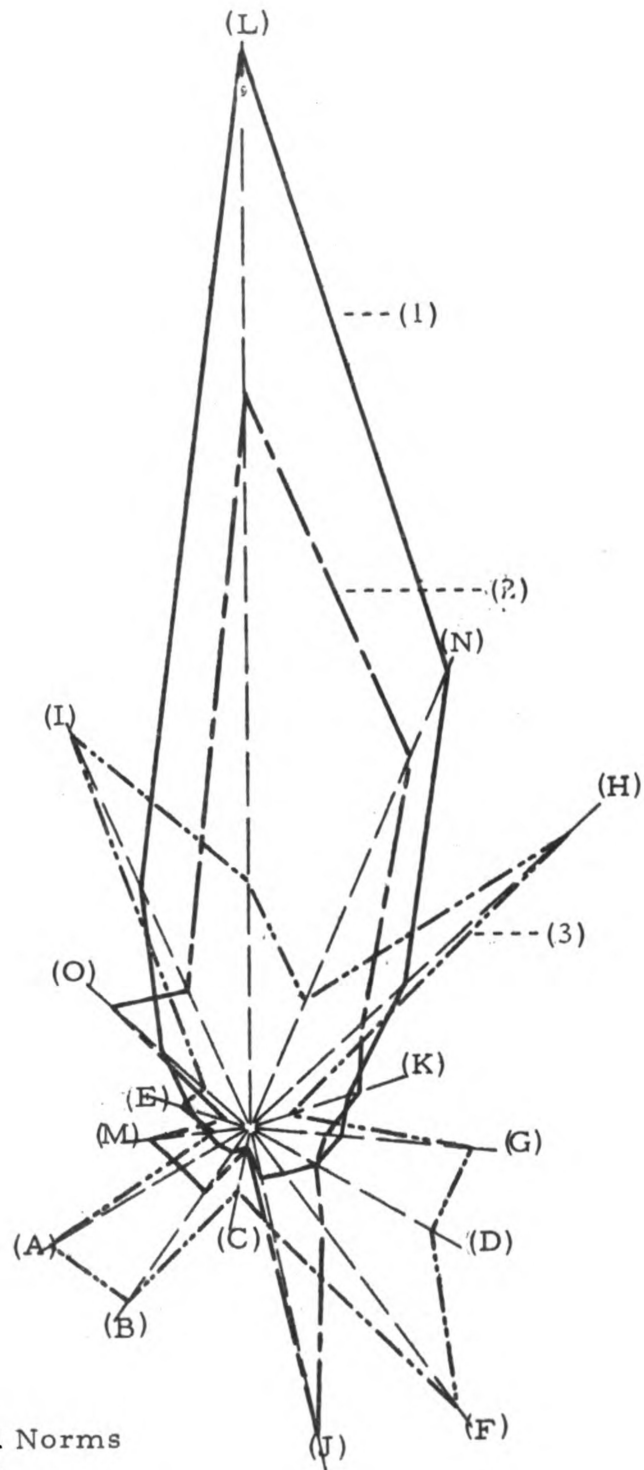
- (1) Departmental Salary Averages
- (2) College Salary Averages
- (3) All-University Salary Averages

Under normal conditions, the average departmental salaries for either faculty or clerical personnel are determined largely by such factors as 1) the relative maturity or length of service of the various staff members, 2) the rate of departmental growth and the availability of junior faculty to fill new positions, 3) efforts to develop new programs or upgrade existing departmental programs by importing faculty at the higher ranks, and 4) the general range of opportunities of departmental staff members both inside and outside the academic market.

Operating Expense Norms The sharp difference in operating expense budgets resulting from the application of group and combined group averages is illustrated in Fig. 8 (p.86). While it would require considerable investigation to determine whether departmental expense patterns have any rational basis, it is clearly evident that the use of group or combined group averages for such heterogeneous categories of expenditures as labor, supplies and services, and equipment is totally unsatisfactory -- particularly with such widely different departments as the laboratory science and humanities departments.

Without exception, the use of combined group operating expense averages caused a decided shift of funds from the laboratory to the non-laboratory programs. Department (A), for example, had its operational expense budget increased from \$7,000 under departmental norms to over \$47,000 under combined group norms; Departments (L) and (N), on the other hand, suffered reductions from \$223,000 to

Fig. 8. -- Comparison of departmental budget projections derived from the application of alternate operating expense unit cost norms



LEGEND

- (1) Departmental Norms
- (2) Group Norms
- (3) Combined Group Norms

\$51,000 and \$104,000 to \$28,000 respectively. Part of the reason for these major shifts in operating expense budgets is of course due to the fact that certain departments normally require far more in the way of supplies and materials or equipment for their particular instructional programs than others. However, since the expense categories are so broad and cover so many expenditures unrelated to the volume of SCH generated, it is entirely possible that some departments have received operating expense budgets which cannot be justified on any basis except historical precedent.

The Validity of Budgetary Relationships and Group Normative Data

From the results derived from the various combinations of budget procedures and normative standards, it becomes quite clear that the application of any one procedure requires a full understanding of the underlying assumptions and sound judgment concerning the determination of appropriate performance standards, rates, or ratios. The validity of the results of any objective procedure thus depends on the validity of the normative standards applied. The cause for increased equity and effectiveness in the allocation and management of institutional resources can be served or defeated by objective budget procedures -- depending upon the quality of judgment exercised in the selection of those cost factors which may be appropriately standardized for all departments and in the determination of suitable levels of performance, appropriate staffing ratios, etc.

In other words, to satisfactorily adapt any of the objective procedures to internal budget considerations, academic administrators must be prepared to decide which factors may legitimately be standardized for groups of departments and which factors must be considered on an individual basis -- in order to properly account for the unique functions and activities of different departments. Thus, the proper application of objective budget procedures to academic departments might require greater rather than less attention to the particular requirements of individual departments. However, by making explicit some of the considerations entering into the allocation of resources to each department, the objective budget procedure provides a useful frame of reference from which departmental performance can be assessed and the effectiveness of resource utilization can be evaluated.

In each of the budget procedures examined in this study, the instructional program is recognized, either directly or indirectly, as the fundamental purpose of higher education institutions. Other functions or supporting activities are treated as a fairly small proportion of the full-time-equivalent faculty workload, or related in some manner to the overall size of the instructional faculty. In a major university, however, functions such as research and public service are generally regarded as fundamental purposes of the institution. Where the various publics served by the institution are willing to accept such functions as legitimate ends to be supported as fully as possible, research and public service activities may be budgeted on their own merits.

However, as illustrated by the three objective procedures examined, research and public service functions are treated more or less as an instructional complement along with academic advising or administrative or committee work.

Even though the various functions performed by academic departments should be kept in proper balance, it is doubtful that the demands placed on individual departments are ever the same, and quite probably, the research or public service functions of individual departments are much more related to current societal needs than to the size of the instructional staff. What appears to be needed, therefore, is some means of distinguishing those functions or staff activities which are directly related to the size of departmental enrollments and/or instructional staff so that the other functions can be properly related to more appropriate workload measures or otherwise justified on their own merits.

It is important to note that when the size of the instructional staff is used as a base for calculating the number of FTE positions to be allocated to each department for other functions, any errors in the projection of teaching staff requirements are compounded and thus raise some doubt about the ultimate achievement of equity. Since all functions are included in departmental unit cost rates under the Indiana approach, similar errors in the projection of SCH volume can result in under-support or over-support of functions that are unrelated to the size of the instructional program.

As already suggested, the use of a cost rate per SCH in determining gross operating expense requirements is of questionable validity at the department level if group averages of gross expenditures are employed. In order to derive valid cost rates for use as normative standards, all operating expenses must be grouped on a homogeneous basis and should be related to the most appropriate base obtainable. In other words, certain expenditures that are common to all departments may be related to the instructional program and vary directly with the size of the total enrollment; other expenditures may be related to student enrollments by instructional level. Some expenditures may be more properly related to the number of FTE faculty members, or to the total salary expenditures. Other expenditures may relate entirely to the number of office machines to be maintained, or to the new office equipment required to support each new staff position added, etc.

The budget category covering all types of equipment should also be sub-divided into homogeneous groups wherever possible. Many expenditures classified as instructional equipment often constitute major purchases which are properly classified as capital expenditures rather than operating expenses. Office equipment likewise may represent a long term investment in some cases and operating expense in others. It is obvious, then, that any attempt to combine such a group of heterogeneous budget items as those represented by the gross categories of labor, supplies and services, and equipment, can hardly be

expected to result in valid cost rates for application to any type of objective budget procedure.

Unless the various elements that make up the total operating budget of academic departments can be grouped on a homogeneous basis and related to appropriate measures of workload or need, the indiscriminant application of group derived normative standards very likely will lead to results that are generally invalid or inequitable -- even though impartial. This is not to say that objective procedures and normative standards are totally inappropriate to the budgeting of academic departments, however,

Before employing normative standards to individual departments, administrative officials must first determine what the "reasonable" levels of performance or activity are for the functions performed by different sizes and types of academic departments and then attempt to ascertain the validity of departmental deviations from such norms. Since the differences which currently exist among similar departments may well be due as much to historical accident as to conscious design, it might present no major problems in the long run if greater standardization of certain areas of budget support were effected.

The Contribution of Objective Budget Procedures to
More Effective Management of Institutional Resources

The utility of objective budget procedures must be judged in terms of the overall contribution they make to greater rationality in budgeting and greater effectiveness in the management of resources. An acceptable procedure should not only assist department heads to spell out the needs of their departments, but also should provide analytical data necessary for university officials to better evaluate individual budget requests in light of established objectives and the total resources available. At the same time, the kind of response that a given procedure is likely to generate on the part of faculty and administrators is also of prime importance. In other words, does a given budget procedure tend to draw a negative response, or does it encourage faculty and staff to begin asking more meaningful and valid questions about the application of all resources?

For an institution as complex and diverse in programs as Michigan State University, the Florida budget procedure based on SCH productivity appears to most closely approximate the desired features outlined above. Although the Florida procedure places primary emphasis on the instructional program by relating all other functions and staffing needs to the size of the instructional staff, it nevertheless is the only one of the three approaches examined which makes explicit the amount of involvement in, or commitment of resources to, such functions as research, public service, administration,

etc. The relationship of instruction and other functional expenditures is thus brought out into the open for full consideration. Such a feature provides needed yardsticks or standards for evaluating both budget requests and actual operating performance.

The SCH productivity approach would undoubtedly prove to be of greatest value to internal budgeting of academic departments if, instead of applying group averages for normative data, standards derived from regression data were applied to productivity levels, staffing ratios, etc. Regression analysis takes into account the fixed and variable cost nature of departmental budgets, and the increased productivity levels which may be expected as departmental enrollments expand.

Another feature of the SCH productivity approach that seems particularly appropriate to a major university is the fact that it makes explicit the desired ratio of temporary and regular faculty and the ratio of regular and student employees filling non-academic positions. Such considerations are very important, not only from the standpoint of current salary levels and the optimization of faculty-mix, but also from the point-of-view of fringe benefits to be funded both currently and as long-range programs; i. e., sabbatical leaves, retirement programs, sick leave benefits, etc.

Each point of decision in the Florida approach has a decided effect on the total budget requirement of a given fiscal period and carries important implications for future years as well. However, the various decision points also provide opportunities for selective adjustments

of budget requests to provide a more judicious allocation of available resources. With a functional breakdown such as provided under the Florida approach, various measures are provided for evaluating subsequent performance and for checking on the reasons behind variances in budgeted and actual performance.

The cost analysis procedure, by way of contrast, provides a simple and direct method of projecting current expenditure patterns into the future, but by presenting only summary unit-costs it offers academic officials no information relative to the combination of resources involved, nor to the adequacy of such resources in achieving assigned purposes. While detailed unit-costs on each course offered by a department can be useful in presenting areas in need of management attention, it must be remembered that such costs reflect conditions of the past, which may or may not be encountered in the future. Thus, the use of historical costs carries with it the assumption that the particular combination of resources associated with a particular instructional volume was most suited to the departmental needs of the time and that the same combination of resources will be most appropriate to the objectives of a future period.

A more appropriate use of the cost-analysis approach would involve the projection of future budget requirements on the basis of estimated costs, which should be derived from careful study of the alternate combinations of resources or cost factors that pertain to future objectives and levels of workload. For the most part, such

an application of the cost-analysis procedure would parallel the development of instructional budgets under the SCH productivity approach, and the resulting budget projections would be identical.

The course-classification procedure appears to be most sensitive to, and thus provides a better picture of, the existing nature of a department's instructional program -- and the reasons for differences in average productivity or unit-costs. While the procedure is perhaps suitable for application to the small single-purpose institution, it is rather unlikely that such an approach would prove to be suitable or acceptable to a large multi-purpose university offering several thousand courses. Aside from raising the issue of optimum section sizes for different types of courses, the California staffing formula really does not encourage much effort toward improvement of teaching methodology or other innovations to increase efficiency and effectiveness of operations. The fact that each of the major cost factors -- average salaries, teaching load, section sizes, and related functions -- are more or less standardized under the procedure would seem to reduce even further any incentive to effect better utilization of resources.

As a matter of fact, any department which cared to subvert the system could effectively lighten its teaching load by resisting any efforts to change the classification of discussion type sections to lecture sections as the total course enrollments increase to the point where many of the smaller sections must be scheduled. Under the California procedure, the more sections required, the larger the teaching staff; the

larger the teaching staff, the more research, professional service, or administrative positions may be authorized. Then, even though contact hours might remain at the standard level, the savings in preparation time for multiple section courses could be utilized for such other purposes.

Even though such purposes may be perfectly legitimate functions of an academic department, the added strain on the physical facilities required to accommodate many small course sections imposes additional costs -- both capital and operating -- which are seldom reckoned with and which might be better utilized in direct support of non-instructional activities. By the same token, under the SCH productivity approach, some departments might attempt to increase the "margin" required to support non-instructional interests by consistently offering as many large lecture sections as possible in order to achieve high SCH productivity with the minimum of faculty effort -- possibly at the expense of students.

The historical patterns of certain departments of this study suggest that although the size of the faculty is generally increased in accordance with enrollment expansions, quite often a relatively small proportion of the added faculty effort is actually allocated to the instructional program, while research and administrative activities receive a much larger share of the increase in faculty resources. Such a pattern of resource application illustrates the desirability of budgeting by function, with due consideration of marginal or

or differential needs.

Long-Range Planning While the primary focus of this study has been on the application of objective budget procedures to the preparation and review of operating budgets of academic departments, some consideration should be given also to their application and possible contributions to long-range planning and program development. Adequate planning requires the projection of a number of alternative courses of action to provide a means of comparing and analyzing the implications and relative payoff of each alternative.⁴ The longer the period of time included in academic plans, the more flexibility educators have in setting up alternative courses of action; thus, the more alternatives available for evaluation, the greater the chance that optimization of resources may occur.⁵

At each level and time period of planning, the requirements for objective data differ; the longer the period under consideration, the less detailed information is required. The objective procedure called for in such a situation should thus be concerned chiefly with broad policy questions and with summary costs. The development of programs to implement long-range objectives requires considerably more detail concerning the various combinations of resources required under each

⁴C. R. Carpenter, "Imaginative Alternatives to our Present Methods of Extension Work," College and University Business, September, 1960, pp. 33-34.

⁵Williams, op. cit., pp. 40-42

alternate course of action. Therefore, a different procedure might be most appropriate at the programming level.

As greater attention is given to long-range planning and programming, regardless of the type of objective procedures and the nature of objective data employed, problems of equitable distribution and effective utilization of resources are apt to take care of themselves. Nevertheless, the translation of departmental programs and activities spanning several years into the future will require the kind of information and analyses which objective procedures are based upon. As budgeting becomes more closely geared to long-range plans and programs of the future, prior years' budgets should assume less and less importance in the determination of the next year's appropriation.

Practical Considerations in the Application of Objective Budget Procedures

As a form of fiscal shorthand, objective budget procedures must be capable of translating educational plans into financial terms -- quickly and economically. If they are to make significant improvements in the budget preparation and review process, such procedures must focus on the right questions and be capable of presenting the subsequent answers in quantitative terms. If they are to contribute something to the logic or rationality of budget decisions, such procedures must also possess a rational or logical nature.

Of the three state-wide budget approaches examined in this

study, the cost-analysis approach is the most simple and direct method for determining total departmental budget needs, assuming that the necessary cost data are already available. However, if the detailed procedures followed in the collection and processing of instructional cost data were to be charged to the budget process alone, the Indiana cost-analysis approach could hardly be classified as simple, direct, or economical !

Because staffing projections must be determined before financial need can be determined under the SCH productivity approach, the Florida procedure generates considerably more detail in its step-by-step projection of departmental budget requirements. Both the cost-analysis and SCH productivity approaches provide a degree of sensitivity to departmental differences and to changing needs by taking into account the differential cost rates and productivity rates encountered at the various instructional levels. Attention to differences in student-mix adds a few steps to the SCH productivity procedure, but may be considered well worth the effort since the procedure offers considerable flexibility and sensitivity to differing requirements.

The California course-classification procedure is by far the most complex and time-consuming of the three approaches -- even after all courses have been classified. Whereas the first two procedures base their projections on gross SCH data by instructional level, the California approach requires a course-by-course projection of enrollments, to which the appropriate cut-off levels are applied. Because

of its great amount of detail, the California staffing formula generally has been regarded as a highly accurate means of determining instructional needs. However, the accuracy of staffing projections and ultimately the corresponding budget projections is highly dependent upon the accuracy with which future workloads or instructional volume may be forecast.

In the case of the 15 departments of this study, experimentation with the projection of instructional volume for the Fall Quarter, 1965, revealed that total SCH volume, projected by instructional level, provided the most accurate estimates. Total departmental instructional volume based on course-by-course enrollment projections, derived from the previous Fall Quarter's enrollment patterns, showed considerably greater error. With student-credit-hour data from the four preceding Fall Quarters, it was possible to project total SCH volume within 1 1/2 % of the actual volume of Fall quarter, 1965. On the other hand, using a refined computer program to project course-by-course enrollments from the previous Fall Quarter patterns, the resulting projections fell short of actual volume by 9 1/4 %.⁶

Even with the SCH projections, there was substantial variation between estimated and actual SCH volume, particularly with those departments which experienced a drop in enrollments. The amount of variation

⁶Joseph L. Saupe, "A Technique for Projecting College or University Instructional Loads" (East Lansing: Office of Instructional Research, Michigan State University, June, 1966.

that enters into workload projections thus suggests that the equity of budget allocations when based on workload projections, depends to a large extent on the accuracy of forecasting or subsequent adjustment of budgets according to actual volume.

Since the application of any one of the objective procedures presented would require computer application for the more than seventy departments of Michigan State University, the question of complexity of procedures is one which would become less significant after the initial program was written. By the same token, the use of objective procedures based on workload projections would undoubtedly spur the development of more refined computer projection, and the problem of accuracy in forecasting perhaps would be ironed out in due time. However, the quality of the results obtained from any computer program would still depend on the quality of human judgment that is fed into the computer.

Summary

The variation in budget projections derived from different combinations of objective procedures and various combinations of normative data indicate that the degree of equity achieved depends upon the way in which workload is defined and measured. For some academic departments, it makes little difference, but for certain departments the budget allocation resulting from the application of objective procedures varies considerably, depending upon whether

measures of departmental input or output are the primary determinants of staffing requirements. Similarly, budget allocations can be influenced greatly by unusual faculty-mix requirements.

However, in spite of the caution with which normative data or standards should be applied to objective procedures, such procedures appear to offer a rational basis for allocating resources and a better means of evaluating the effectiveness of resource utilization. In order to select a suitable objective procedure and appropriate normative data, academic officials must first provide answers to several questions concerning those factors which should be standardized and those which should be determined on an individual basis. By reducing appropriate budget considerations to objective terms, university officials can better utilize their time and talents in giving closer attention to those budget factors or activities which must be evaluated subjectively.

The most significant contribution of objective budget procedures may very well be in the area of long-range planning and program development, where they may be employed to project a wide variety of alternative courses of action for evaluation and subsequent selection of preferred alternatives. Given such long-range perspective and direction, annual operating budgets should thus be reasonably simple to derive objectively and, most certainly, they would then reflect a planned rather than an accidental development of academic departments and their various programs.

CHAPTER VI

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS FOR FUTURE RESEARCH

As typically employed by colleges and universities, the budget preparation and review process generally involves a comparison of proposed budgets with current levels of support -- with little consideration given to the actual use made of existing resources or to the values derived therefrom. Under such an approach, academic administrators are forced to compete for limited funds by making the most persuasive budget presentation possible -- employing whatever assortment of facts necessary to present evidence of the need for increased allocations. As a result, such budget requests tend to emphasize only those aspects of departmental operations which dramatize the need for increased support and tend also to gloss over those areas which are likely to raise questions concerning the effectiveness of resource utilization.

The achievement of equitable budgetary allocations and more effective utilization of institutional resources requires, in some cases, a complete re-orientation of administrative thinking toward the application of all resources -- not simply financial resources. Moreover, instead of accepting a given administrative unit or program as worthy

of continuous support merely because it presently exists, administrators need to focus attention on the objectives to be served by such programs or organizational units and attempt to determine the best combination of resources available for the attainment of such goals. An objective-oriented approach may well turn up areas of activity which no longer are appropriate to the times, or which have costs that are out of all proportion to the values received from the perpetuation of such activities. At the same time, proposed or developing programs may be judged to be much more appropriate to current institutional objectives and thus worthy of increased emphasis and support. Consequently, budgetary considerations need to focus on the job or function to be performed rather than on the expenditure levels of a previous budget period.

Such a re-orientation of budgetary thinking has occurred in many governmental operations from the federal government on down to the municipal level -- under the title of program or performance budgeting. Similar developments have occurred in some state-wide systems of higher education where more objective approaches to budget preparation and review have taken the form of cost analysis or formula budgeting. These objective procedures have been employed at the institutional level to assist state budget officials and legislative bodies in making more equitable distribution of the funds appropriated for higher education.

Although certain aspects of budget formulas and cost analysis

procedures have been associated with sound management practice in many institutions for a number of years, the determination of total institutional needs through objective budget procedures is a relatively recent development. However, the application of similar procedures to internal budget matters has been more or less limited to non-academic areas and has even been discouraged by some authorities -- primarily because of the possible abuses that might result from their application to academic departments and programs.

The variety of formula and cost analysis procedures employed in state-wide budgeting for higher education suggests that the appropriateness of any given procedure is related to the nature of the institutions covered and the political forces at work at a given point in time. Thus, an objective procedure which may be considered appropriate for a group of institutions in one state may not be deemed as suitable for a different combination of institutions in another state. Similarly, if applied internally, one type of objective procedure might be judged suitable for a particular combination of educational programs at one institution, while a different procedure might be considered more appropriate for the kinds of programs at a different type of institution.

Conclusions

The results of applying state-wide budget procedures to the internal budgeting of academic departments seem to indicate 1) that university budgeting can be moved in the direction of greater objectivity and equity through the selective application of various types of

formula or cost analysis techniques; 2) that a more rational approach to effective resource allocation and utilization is possible with objective budget procedures than with traditional budget approaches; 3) that given adequate study and careful testing, objective procedures can be developed to the point where they are both sensitive to departmental differences and flexible enough to accommodate the inevitable changes that occur from year to year in any dynamic institution; and 4) that by making explicit the various relationships that enter into resource utilization, more effective management of resources and better evaluation of management effort are possible.

However, the results of applying state-wide budget procedures to academic departments also suggest that the use of formulas or cost analysis does not automatically guarantee effective and equitable budgeting and that considerable caution is required in the application thereof. Furthermore, the achievement of equitable budget allocations appears to rest not so much with the procedures as with the kinds of normative data or standards that are applied under each procedure. Since each type of objective budget approach is based on certain assumptions, full understanding of their relevance to a given situation should precede the adoption of a given procedure. The equity of departmental budget allocations under an objective procedure depends to a great extent upon the definition of equity -- expressed or implied -- along with the degree of standardization that such a definition imposes.

The development of appropriate normative data depends upon

a clear understanding of those factors which appropriately may be standardized for groups of similar departments or for all departments of a university and of those factors which should be determined solely on the basis of individual judgment. The selection of various budget devices for inclusion in an objective procedure should attempt to counteract the common tendency to avoid the more difficult decisions by relating non-measurable activities to other quantifiable activities, or to some "convenient" unit that actually bears no relationship to the activity in question. Budgeting by function thus appears to offer the most rational approach to effective resource allocation -- even though it requires considerably more subjective analysis and evaluation. Nevertheless, a functional approach requires a constant search for and evaluation of appropriate performance standards or other measures of activity relating to the various functions performed by academic departments.

In the last analysis, acceptance of objective budget procedures and the selection of a particular approach depends to a great extent upon the administrative philosophy and practice at a given institution. If institutional practice follows a highly centralized pattern of administrative control, then a much greater degree of standardization of workload, staffing ratios, etc. can be expected; standards of performance are apt to be narrowly defined. In such a case, the course-classification approach might find ready acceptance. If an institution employs a de-centralized control pattern, a minimum of standardization is likely

to be prescribed -- allowing academic departments considerable latitude for determining their own areas of emphasis and subsequent courses of action. In this case, the cost analysis approach, with its high degree of flexibility, might tend to have major appeal.

On the other hand, if an institution's administrators seek to achieve decentralized control of operations with centralized coordination, the SCH productivity approach appears to offer an excellent compromise. Under such a procedure, departments could be free to spell out the peculiar needs of their programs and to suggest the most effective combination of resources required to effectively carry out their assigned objectives. At the same time, however, academic administrators would have a useful means of reviewing operations to insure that departmental activities are consonant with the overall objectives and programs of the institution.

Regardless of the administrative style of an institution, the achievement of more effective utilization of resources ultimately requires much greater emphasis on long-range planning and programming, both of which require objective procedures for estimating or projecting the various resource requirements associated with future goals and purposes. Thus, it is at the long-range planning and programming levels that objective budget procedures may be able to make the most positive and significant contribution to more effective budgeting. Nevertheless, if objective procedures do nothing more than insure that more of the "right questions" are posed during the budget preparation

and review process, the increased awareness of the relationships between departmental resources and objectives should contribute greatly to a more effective utilization of the total resources available to an institution.

Objective budget procedures in the hands of knowledgeable and responsible administrators appear to be much like the "wonder drugs" at the disposal of the modern physician. Used properly in an appropriate situation, each offers promise of greater control over the situation; at the same time, neither presents a cure-all for all problems and the possible side effects demand that they not be used indiscriminantly.

Suggestions for Further Research

High on the list of additional studies needed in connection with the application of any objective budget procedure is the need for more refined normative standards in the area of staffing and in the area of operating expenses. In both the academic and non-academic personnel areas, much more needs to be known about departmental staffing patterns and the major causes of the variation that exists among departments. An important issue, from the standpoint of academic quality, concerns the increasing use of graduate assistants in direct teaching roles where they sometimes produce a disproportionate share of student-credit-hours for their departments. Thus, further investigations in the area of faculty-mix might well attempt to determine.

the optimum ratios of regular and temporary faculty. Likewise, the question of desirable and realistic levels of administrative and clerical support for different types of faculty bears investigation.

In spite of the relatively small percentage of the total academic budget allocated to operating expenses, the magnitude of such budget allocations is certainly sufficient to warrant considerable study of the various expenditure classifications included in the budget categories of labor, supplies and services, and equipment to determine which classifications lend themselves to budget formulas and to what factors such expenditures appropriately are related.

Another area that is highly significant to any consideration of budgetary requirements concerns the combined sources of funds available to academic departments, rather than simply a review of general fund allocations; i. e., to what extent do research grants or contracts, royalties on departmental publications, endowment income, special student fees, Dean's contingency funds, etc. change the overall picture of a department's income and expenditure patterns? The investigation of the combined source and application of funds perhaps raises a highly sensitive issue which relates directly to such matters as departmental initiative, achievements, and morale. Nevertheless, without having some idea of the total resources available to departments -- regardless of the source -- academic administrators cannot begin to determine the adequacy or equity of any general fund budget allocation. By the same token, without the total picture of departmental resources

and activities, a university administration can never determine to what extent general fund monies are being used to subsidize such activities as sponsored research projects or vice-versa.

In most institutions of higher education, the assumption is often made that the achievement of quality education is simply a matter of obtaining additional funds to support and extend current programs and activities. However, since little is presently known about the budget patterns associated with "high quality" programs or departments, further research might also include investigation of the resource allocation patterns of departments which are regarded as "centers of excellence" to determine the extent to which the budgets of such departments deviate from "equitable" levels suggested by objective budget procedures.

APPENDIX A

DEFINITIONS

Academic Personnel -- employees of an institution who are primarily and directly involved in instructional, research, and professional service responsibilities or the administration thereof. Normally these include all personnel holding the ranks of professor, associate professor, assistant professor, instructor, plus part-time faculty, lecturers, graduate fellows and assistants or other titles given students who also have responsibility for teaching a course or part of a course, professional librarians, deans, and other administrative personnel associated with the functions listed above.

Administration and Committee -- committee and other activities related to general administration at the department, college, or university level. Excludes committee activities that can be specifically associated with instruction, research, or professional service, which are properly reported under the appropriate function.

Administration, General -- with reference to the functional classification of expenditures -- the general executive and administrative offices serving the institution as a whole. For budget purposes, salaries of officers, secretaries and clerks, office expense and supplies, travel, the office equipment of the general executives' offices concerned with the administration of the institution as a whole are included under this classification. Such accounts include the governing board of the institution, the president, and central executive offices and their staffs.

Class -- a formally organized group of students meeting at the same time with a teaching staff member in a given place. Some courses are taught in several different groups meeting at different times and possibly with different teaching staff members; each of these groups is considered a class. All other instruction, e. g., independent study, thesis direction, etc. are considered "non-organized" and therefore do not fall within the definition of a class.

Class Size, Weighted Average -- the weighted average size of sections of a given type is calculated by weighting the enrollment in each section by the credit value of the section. Algebraically, it is the ratio of student credit hours to credits of teaching.

Cost Analysis -- a variety of procedures which utilize objective data and which is carried on as a series of logical steps. An objective procedure can be repeated and, so long as the same objective data are used, the result will be the same.

Course -- normally the smallest category of subject matter recognized in the official records of an institution; customarily assigned a credit hour value indicating the numerical value it carries toward degree requirements.

Credits of Teaching, Average -- the average number of actual, imputed, and weighted average credit-hours of teaching performed by a full-time equivalent teaching staff member.

Credit-Hour -- the numerical value a course carries toward degree requirements; may be a fixed or variable value.

Equipment -- durable goods or other movable and non-consumable items.

Full-Time Equivalent Students -- the quotient resulting from the division of student credit hours elected by students at a certain class level by a figure assumed to represent a full-time student load at that level. As prescribed by the Michigan Council of State College Presidents, the quarterly full-time student load is assumed to be 15.5 credit hours at the undergraduate level; 12 credit hours at the Master's level; and 8 credit hours at the Doctoral level.

Full-Time Equivalent (Personnel) -- for one person, the decimal number (1.0 or less) representing the average full-time equivalence of that person's total duties and responsibilities throughout the academic year, generally based on the terms of that person's employment contract.

Formulas -- an objective procedure for estimating future budgetary requirements of an institution through the manipulation of objective data about future programs and relationships between programs and costs, in such a way as to derive an estimate of future costs. In practice, the term formula is often applied to an individual device relating to specific activities or to a series of formulas covering a variety of activities.

General Fund -- student fee and State-supported revenue and expense items -- for educational and general purposes involved with the State budget process.

Imputed Credits -- credit hours assigned to courses which are offered by academic divisions of the institution but which do not regularly carry credit, or credit hours assigned to sub-courses (e.g., lecture, laboratory, or quiz sections) to reflect that portion of the total course credit which each sub-course represents.

Instruction -- activities involved in teaching fixed and variable credit undergraduate and graduate courses, including preparation, evaluation, and student conferences; academic advising; direction of or consultation on dissertations; service on doctoral committees; course, curriculum and program planning; and other activities associated most directly with the instructional program.

Levels of Students -- categories in terms of which numbers of students and student credit hours are reported for cost analyses; include Lower Division (freshmen and sophomores), Upper Division (juniors and seniors), Master's level (graduate students working at the level of the Master's degree or the sixth-year programs in Education), Doctoral level (students working beyond the normal Master's level toward the Ph. D., Ed. D. or equivalent) with "special" students assigned to one of the above categories as deemed appropriate.

Non-Academic Personnel -- employees of an institution who are not included in the categories of teaching or non-teaching personnel.

Non-Teaching Academic Personnel -- professional or administrative personnel (as opposed to technical, clerical, service and laboring personnel) who have academic titles in the areas of research, counseling, administration, teaching, or the library, but who are paid for primary functions other than the teaching function.

Objective Data -- quantified information which is expressed in uniform units of measurement which can be manipulated mathematically. This includes information concerning programs and activities, costs, or the relationship between programs and costs.

Objective Procedure -- a procedure which involves the use of objective data and which is carried on as a series of logical steps. An

objective procedure can be repeated and, so long as the same objective data are used, the result will be the same

Professional Service -- activities in which a faculty member's professional competence is made available to the general public or to special groups. Includes non-credit Continuing Education activities; speeches and direct service to lay groups or individuals; unremunerated consultation within or outside of the University; radio and television appearances; and editorial or committee service to scholarly or professional organizations.

Research, Creative and Scholarly -- all unsponsored research, creative, and scholarly activities, excluding class preparation and preparation for professional service activities. Includes planning, carrying out, and reporting of individual or departmental (including "All University" supported) research; professional writing; and artistic and other creative activities.

Research, Organized -- with reference to the functional classification of expenditures for Michigan institutions -- separately organized research divisions of the institution, such as research bureaus, research institutes, and other individually budgeted research projects and investigations; does not include departmental research which is not separately budgeted or financed, and does not include research performed under contract.

Student-Credit-Hour -- a unit of instructional productivity representing one student electing one actual or imputed credit-hour of instruction for one academic term.

Supplies and Other Expense -- consumable goods, travel, hourly labor, telephone, and any other miscellaneous expenses incurred by the instructional unit excluding those reported under "academic personnel," "non-academic personnel," and "equipment."

Teaching Staff Member -- a member of the academic staff who has direct responsibility for teaching a course or part thereof.

Weighted Average Credits -- the credit hour value ascribed to a course carrying variable credit, computed by dividing the total student credit hours elected by the number of students enrolled.

APPENDIX B

TABLE 1-a. -- Weighted average instructional volume in student-credit-hours, fall quarters, 1962-65

Dept.	Lower Division SCH	Upper Division SCH	Graduate SCH	Total SCH
<u>Group I</u>				
(A)	8,363	3,927	646	12,936
(B)	8,649	5,559	627	14,835
(C)	2,912	2,118	202	5,232
(D)	5,518	3,856	1,330	10,704
(E)	2,322	1,070	256	3,648
(F)	21,619	3,462	1,133	26,214
(G)	3,740	4,404	687	8,831
(H)	10,145	5,339	1,768	17,252
(I)	<u>4,656</u>	<u>3,775</u>	<u>970</u>	<u>9,401</u>
Total	67,924	33,510	7,619	109,053
<u>Group II</u>				
(J)	2,461	1,345	383	4,189
(K)	1,330	987	288	2,605
(L)	9,048	3,138	840	13,026
(M)	817	644	265	1,726
(N)	4,880	988	803	6,671
(O)	<u>1,994</u>	<u>2,828</u>	<u>258</u>	<u>5,080</u>
Total	20,530	9,930	2,837	33,297
Combined Total	88,454	43,440	10,456	142,350

Source: Volume of Instruction Analysis, Fall '62, Fall '63, Fall '64
Office of Institutional Research, Michigan State University

TABLE 1-b. -- Weighted average full-time-equivalent students of selected departments, Fall '62 -- Fall '64

Dept.	Undergrad. FTES	Masters FTES	Doctoral FTES	Total FTES
<u>Group I</u>				
(A)	792.9	34.0	29.7	856.6
(B)	916.6	46.2	9.1	971.9
(C)	324.5	15.0	3.0	342.5
(D)	604.8	104.0	10.3	719.1
(E)	218.8	13.6	11.5	243.9
(F)	1,618.1	83.4	16.5	1,718.0
(G)	525.4	41.1	24.2	590.7
(H)	999.0	93.5	80.8	1,173.3
(I)	<u>543.9</u>	<u>58.3</u>	<u>33.8</u>	<u>636.0</u>
Total	6,544.0	489.1	217.1	7,250.2
<u>Group II</u>				
(J)	245.5	24.3	11.4	281.2
(K)	149.5	11.1	19.4	180.0
(L)	786.2	35.9	51.1	873.2
(M)	94.3	14.6	11.1	120.0
(N)	378.6	39.5	41.2	459.3
(O)	<u>311.1</u>	<u>15.4</u>	<u>9.1</u>	<u>335.6</u>
Total	1,965.2	140.8	143.3	2,249.3
Combined Total	8,509.2	629.9	360.4	9,499.5

TABLE 1-c. -- Academic year and weighted average student-credit-hours of selected departments, 1962--1965

Dept.	1962-63 SCH	1963-64 SCH	1964-65 SCH	Wtd. Avg. SCH	Fall SCH ¹ Index
<u>Group I</u>					
(A)	29,163	36,386	41,297	37,638	0.3437
(B)	37,357	41,008	45,447	42,620	0.3481
(C)	13,600	13,195	13,654	13,492	0.3878
(D)	27,970	31,427	30,854	30,565	0.3502
(E)	9,011	10,592	12,372	11,219	0.3252
(F)	52,687	58,744	72,647	64,687	0.4052
(G)	20,243	24,845	30,213	26,762	0.3300
(H)	46,055	49,902	59,168	53,895	0.3201
(I)	27,364	31,688	26,663	28,455	0.3304
Total	263,450	297,787	332,315	309,334	0.3525
<u>Group II</u>					
(J)	9,950	11,679	13,811	12,457	0.3363
(K)	7,105	7,697	8,166	7,833	0.3326
(L)	30,990	31,552	36,442	33,904	0.3842
(M)	4,361	4,762	4,732	4,680	0.3688
(N)	14,941	16,899	20,522	18,384	0.3629
(O)	15,015	15,788	15,034	15,282	0.3324
Total	82,362	88,377	98,707	92,541	0.3598
Combined Total	345,812	386,164	431,022	401,876	0.3542

Source: Volume of Instruction Analysis, 1962-63, 1963-64, & 1964-65,
Office of Institutional Research, Michigan State University

TABLE 1-d. -- Proportion of weighted average Fall student-credit-hours taught at each instructional level of selected departments, 1962-1965

Dept.	Lower Division SCH	Upper Division SCH	Masters SCH	Doctoral SCH
<u>Group I</u>	0.6228	0.3072	0.0539	0.0161
(A)	0.6465	0.3035	0.0315	0.0185
(B)	0.5830	0.3747	0.0374	0.0049
(C)	0.5564	0.4047	0.0343	0.0046
(D)	0.5155	0.3602	0.1166	0.0077
(E)	0.6365	0.2935	0.0449	0.0251
(F)	0.8248	0.1320	0.0382	0.0050
(G)	0.4235	0.4988	0.0558	0.0219
(H)	0.5880	0.3094	0.0651	0.0375
(I)	0.4953	0.4016	0.0744	0.0287
<u>Group II</u>	0.6166	0.2982	0.0508	0.0344
(J)	0.5876	0.3211	0.0696	0.0217
(K)	0.5106	0.3788	0.0511	0.0595
(L)	0.6946	0.2409	0.0331	0.0314
(M)	0.4734	0.3731	0.1019	0.0516
(N)	0.7315	0.1481	0.0711	0.0493
(O)	0.3926	0.5566	0.0364	0.0143
<u>Combined Group</u>	0.6213	0.3051	0.0532	0.0204

TABLE 1-e. -- Actual Fall '65 and projected 1965-66 student-credit-hours of selected departments

Department	Fall '65 SCH	Proj. '65-66 SCH
(A)	16,546	48,141
(B)	16,501	47,403
(C)	4,781	13,935
(D)	13,043	37,244
(E)	4,517	13,890
(F)	34,395	84,884
(G)	13,356	40,473
(H)	23,607	73,749
(I)	11,503	34,815
(J)	6,534	19,429
(K)	2,014	6,055
(L)	18,468	48,069
(M)	1,841	4,992
(N)	8,249	22,731
(O)	3,876	11,661
Total	179,231	507,471

TABLE 2-a. -- Weighted average full-time equivalent faculty of selected departments, 1962-65 (by function)

<u>Dept.</u>	<u>Instr.</u> <u>FTEF</u>	<u>Research</u> <u>FTEF</u>	<u>Prof.Serv.</u> <u>FTEF</u>	<u>Admin.</u> <u>FTEF</u>	<u>Total</u> <u>FTEF</u>	<u>Grad.Asst.</u> <u>FETF</u>
<u>Group I</u>						
(A)	36.1	3.6	0.2	2.6	42.5	6.1
(B)	27.8	3.0	0.3	2.1	33.2	11.0
(C)	13.9	1.1	0.2	1.6	16.8	3.7
(D)	24.0	4.6	0.2	1.9	30.7	6.0
(E)	8.0	1.3	0.3	1.2	10.8	2.4
(F)	51.3	6.6	1.2	2.9	62.0	18.6
(G)	17.5	7.4	0.2	2.8	27.9	6.2
(H)	27.0	5.3	1.1	2.2	35.6	5.8
(I)	15.5	2.4	0.7	2.5	21.1	5.8
Total	221.1	35.2	4.5	19.8	280.6	65.6
<u>Group II</u>						
(J)	14.6	1.7	0.0	2.0	18.3	5.2
(K)	15.2	3.1	0.5	2.7	21.5	5.3
(L)	51.7	4.5	0.6	3.0	59.8	32.0
(M)	9.5	1.7	0.7	1.2	13.1	3.3
(N)	23.9	8.2	0.3	3.5	35.9	12.1
(O)	16.6	3.2	0.0	2.0	21.8	8.5
Total	131.4	22.5	2.0	14.4	170.3	66.4
<u>Combined</u>						
Total	352.5	57.7	6.5	34.2	450.9	132.0

Source: Faculty Load & Time Distribution Analysis, Fall '62, Fall '63, & Fall '64. Office of Institutional Research, Michigan State University.

Also: Michigan State University Salary Schedule, 1962-63, 1963-64, and 1964-65.

TABLE 2-b. -- Weighted average staffing ratios of regular faculty, graduate assistant, and clerical personnel of selected departments, 1962-1965

Dept.	$\frac{\text{FTEF(I)}}{\text{FTEF(R)}}$	$\frac{\text{FTEF(I)}}{\text{FTEF(PS)}}$	$\frac{\text{FTEF(I+R+PS)}}{\text{FTEF (Admin.)}}$	$\frac{\text{Grad. Asst. FTE}}{\text{Total FTEF}}$	$\frac{\text{Clerical FTE}}{\text{Reg. FTEF}}$
<u>Group I</u>	6.3	49.1	13.2	0.234	0.166
(A)	10.0	180.0	15.3	0.144	0.077
(B)	9.3	92.7	14.8	0.331	0.138
(C)	12.6	69.5	9.5	0.220	0.142
(D)	5.2	120.0	15.2	0.195	0.230
(E)	6.2	26.7	8.0	0.222	0.221
(F)	7.8	42.8	20.4	0.300	0.132
(G)	2.4	87.5	9.0	0.222	0.177
(H)	5.1	24.5	15.2	0.163	0.197
(I)	6.5	22.1	7.4	0.275	0.314
<u>Group II</u>	5.8	65.7	10.8	0.390	0.206
(J)	8.6	-0-	8.2	0.284	0.152
(K)	4.9	30.4	7.0	0.246	0.294
(L)	11.5	86.2	18.9	0.535	0.305
(M)	5.6	13.6	9.9	0.252	0.183
(N)	2.9	79.7	9.3	0.337	0.132
(O)	5.2	-0-	9.9	0.390	0.158
<u>Combined Group</u>	6.1	54.2	12.2	0.293	0.178

TABLE 3 -- Weighted average Fall instructional productivity and student-faculty ratios of selected departments 1962-1965

Dept.	SCH/FTEF(I)	SCH/FTEF(T)	FTES/FTEF(I)	FTES/FTEF(T)
<u>Group I</u>	493.2	388.6	32.8	25.8
(A)	358.3	304.4	23.7	20.2
(B)	533.6	446.8	35.0	29.3
(C)	376.5	311.5	24.6	20.4
(D)	446.0	348.7	30.0	23.4
(E)	456.0	337.8	30.5	22.6
(F)	511.0	422.8	33.5	27.7
(G)	504.6	316.5	33.8	21.2
(H)	639.0	484.6	43.5	33.0
(I)	606.5	445.5	41.0	30.1
<u>Group II</u>	253.4	195.5	17.1	13.2
(J)	286.9	228.9	19.3	15.4
(K)	171.4	121.2	11.8	8.4
(L)	252.0	217.8	16.9	14.6
(M)	181.7	131.8	12.6	9.2
(N)	279.1	185.8	19.2	12.8
(O)	306.0	233.0	20.2	15.4
<u>Combined Group</u>	403.8	315.7	26.9	21.1

TABLE 4. -- Weighted average academic year general fund budgets
for selected departments, 1962-1965

Dept.	Academic Salaries	Clerical Salaries	Labor	Supplies & Services	Equip- ment	Total Budget
<u>Group I</u>						
(A)	\$389,266	\$11,945	\$-0-	\$4,263	\$1,200	\$406,674
(B)	275,188	13,345	500	4,310	400	293,743
(C)	134,187	7,602	750	2,543	740	145,822
(D)	312,000	21,796	808	10,844	1,332	346,780
(E)	101,516	6,245	2,067	5,452	2,753	118,033
(F)	430,185	12,000	750	6,564	1,521	451,020
(G)	264,705	14,110	512	11,488	417	291,232
(H)	340,320	24,690	11,383	14,025	6,250	396,668
(I)	<u>189,483</u>	<u>19,237</u>	<u>2,000</u>	<u>14,047</u>	<u>4,667</u>	<u>229,434</u>
Total	2,436,850	130,970	18,770	73,536	19,280	2,679,406
<u>Group II</u>						
(J)	156,158	6,958	400	5,452	1,077	170,045
(K)	215,634	14,530	10,800	15,332	1,482	257,858
(L)	402,468	29,919	53,250	91,056	12,922	589,615
(M)	129,704	4,900	1,939	6,245	448	143,236
(N)	352,964	12,787	54,144	21,744	8,135	449,774
(O)	<u>169,679</u>	<u>9,835</u>	<u>5,883</u>	<u>18,474</u>	<u>5,974</u>	<u>209,845</u>
Total	1,426,607	78,929	126,496	158,303	30,038	1,820,373
Comb. Total	3,863,457	209,899	145,266	231,839	49,318	4,499,779

TABLE 5-a.-- Weighted average salaries cost per student-credit-hour
(all levels) of selected departments, 1962--1965

Department	Cost per Student-Credit-Hour ¹		
	(1)	(2)	(3)
<u>Group I</u>	\$ 8.30	\$8.30	\$10.14
(A)	10.66	7.92	9.43
(B)	6.77	7.47	8.89
(C)	10.51	7.47	8.89
(D)	10.92	9.40	11.11
(E)	9.61	8.58	10.20
(F)	6.84	6.84	8.08
(G)	10.42	9.20	10.98
(H)	6.77	9.79	11.64
(I)	7.34	9.75	11.60
<u>Group II</u>	16.27	16.27	10.14
(J)	13.09	16.03	10.71
(K)	29.38	18.75	13.04
(L)	12.75	14.98	10.15
(M)	28.76	20.19	13.80
(N)	19.90	17.45	12.06
(O)	11.75	15.52	10.14
<u>Combined Group</u>	10.14	10.14	10.14

¹Based on the following norms:

- (1) Departmental
- (2) Group
- (3) Combined Group

TABLE 5-b. -- Weighted average salaries cost per student-credit-hour
by level of selected departments 1962-65

Dept.	Lower Division Cost/SCH	Upper Division Cost/SCH	Masters Cost/SCH	Doctoral Cost/SCH
<u>Group I</u>	\$5.32	\$8.05	\$28.07	\$62.56
(A)	8.89	10.19	17.17	68.58
(B)	4.84	7.68	55.44	114.60
(C)	8.32	10.61	39.44	50.60
(D)	5.15	10.70	32.90	74.99
(E)	5.34	7.50	41.23	85.86
(F)	5.74	9.53	15.83	48.29
(G)	6.34	9.65	48.66	91.59
(H)	2.85	5.02	22.42	55.62
(I)	3.85	6.30	19.12	51.42
<u>Group II</u>	9.52	15.54	48.18	96.52
(J)	11.27	10.59	26.42	57.10
(K)	13.27	30.14	54.69	141.10
(L)	8.09	15.75	36.50	67.80
(M)	13.76	20.35	69.01	147.80
(N)	10.84	15.32	59.70	110.50
(O)	5.98	11.29	54.00	80.40
<u>Combined Group</u>	6.28	9.73	32.52	75.32

TABLE 6-a. -- Weighted average overhead cost¹ per student-credit-hour of selected departments 1962-1965

Department	Cost per Student-Credit-Hour ²		
	(1)	(2)	(3)
<u>Group I</u>	\$0.361	\$0.361	\$1.061
(A)	0.145	0.344	0.989
(B)	0.122	0.342	0.933
(C)	0.299	0.324	0.933
(D)	0.425	0.408	1.165
(E)	0.916	0.373	1.070
(F)	0.137	0.297	0.848
(G)	0.464	0.400	1.150
(H)	0.587	0.425	1.220
(I)	0.728	0.424	1.216
<u>Group II</u>	3.402	3.402	1.061
(J)	0.556	3.352	1.123
(K)	3.536	3.962	1.366
(L)	4.637	3.132	1.064
(M)	1.844	4.222	1.446
(N)	4.570	3.648	1.264
(O)	1.985	3.245	1.063
<u>Combined Group</u>	1.061	1.061	1.061

¹Includes the MSU Budget Categories: Labor, Supplies and Services, and Equipment.

²Based on the following norms:

- (1) Departmental
- (2) Group
- (3) Combined Group

TABLE 6-b. -- Weighted average operating expense¹ per student-credit-hour (by level)² of selected departments, 1962-65

<u>Group</u>	Lower Division Cost/SCH	Upper Division Cost/SCH	Masters Cost/SCH	Doctoral Cost/SCH
I	\$0.23	\$0.35	\$1.22	\$2.72
II	1.99	3.25	10.07	20.18
Combined	0.66	1.02	3.40	7.88

¹Includes M.S.U. Budget Categories: Labor, Supplies & Services, and Equipment

²Allocated on the basis of salary costs by level

APPENDIX C

TABLE 7-a. -- Projected 1965-66 budget requirements for selected departments of Michigan State University, based on the cost analysis approach (academic and clerical salaries)

Department	Salary Budgets ¹		
	(1)	(2)	(3)
<u>Group I</u>			
(A)	\$513,183	\$381,277	\$453,970
(B)	320,918	354,410	421,413
(C)	146,457	104,094	123,882
(D)	406,704	350,094	413,781
(E)	133,483	119,176	141,678
(F)	580,606	580,606	685,863
(G)	421,729	372,352	444,394
(H)	499,281	722,003	858,438
(I)	255,542	339,446	403,854
Total	\$3,277,903	\$3,323,458	\$3,947,273
<u>Group II</u>			
(J)	254,326	311,447	208,085
(K)	177,896	113,531	78,957
(L)	612,880	720,074	487,900
(M)	143,570	100,788	68,890
(N)	452,347	396,656	274,136
(O)	137,017	180,979	118,242
Total	\$1,778,036	\$1,823,475	\$1,236,210
Combined Total	\$5,055,939	\$5,146,933	\$5,183,483

¹Based on the following norms:

- (1) Departmental
- (2) Group
- (3) Combined Group

TABLE 7-b. -- Projected 1965-66 budget requirements for selected departments of Michigan State University, based on the cost analysis approach (operating expenses)

Department	Operating Expense Budgets ¹		
	(1)	(2)	(3)
<u>Group I</u>			
(A)	\$ 6,980	\$16,560	\$47,611
(B)	5,783	16,212	44,227
(C)	4,167	4,515	13,001
(D)	15,829	15,196	43,389
(E)	12,723	5,181	14,862
(F)	11,629	25,210	71,982
(G)	18,779	16,189	46,544
(H)	43,291	31,343	89,974
(I)	53,689	31,270	89,679
Total	\$172,870	\$161,676	\$461,269
<u>Group II</u>			
(J)	10,802	65,126	21,819
(K)	21,410	23,990	8,271
(L)	222,896	150,552	51,145
(M)	9,205	21,076	7,218
(N)	103,881	82,923	28,323
(O)	23,147	37,840	12,396
Total	\$391,341	\$381,507	\$129,172
Combined Total	\$564,211	\$543,183	\$590,441

¹Based on the following norms:

- (1) Departmental
- (2) Group
- (3) Combined Group

TABLE 7-c. -- Projected 1965-66 budget requirements for selected departments of Michigan State University, based on regression analysis (total budget on total Fall SCH)

Department	Salary Budgets ¹	
	(1)	(2)
<u>Group I</u>		
(A)	\$357,797	\$394,013
(B)	357,130	393,366
(C)	183,569	225,044
(D)	305,921	343,703
(E)	179,659	221,252
(F)	622,123	650,360
(G)	310,556	348,198
(H)	462,363	495,423
(I)	283,115	321,585
Total	3,062,233	3,392,944
<u>Group II</u>		
(J)	337,285	250,220
(K)	157,286	185,304
(L)	812,533	421,616
(M)	150,396	182,819
(N)	405,582	274,851
(O)	231,436	212,046
Total	2,094,518	1,526,856
Combined Total	\$5,156,751	\$4,919,800

¹Based on the following norms:

- (1) Group productivity and staffing ratios, departmental salaries
- (2) Combined group productivity and staffing ratios, departmental salaries

TABLE 8-a. -- Projected 1965-66 academic staff for selected departments of Michigan State University, based on SCH productivity rates and related staffing ratios (departmental norms)

Dept.	FTEF (Instr.)	FTEF (Res.)	FTEF (Pro.S)	FTEF (Admin.)	FTEF (Total)
<u>Group I</u>					
(A)	46.2	4.6	0.3	3.3	54.4
(B)	30.9	3.3	0.3	2.3	36.8
(C)	12.7	1.0	0.2	1.5	15.4
(D)	29.2	5.6	0.2	2.3	37.3
(E)	9.9	1.6	0.4	1.5	13.4
(F)	67.3	8.7	1.6	3.8	81.4
(G)	26.5	11.2	0.3	4.2	42.2
(H)	36.9	7.2	1.5	3.0	48.6
(I)	19.0	2.9	0.9	3.1	25.9
Total	278.6	46.1	5.7	25.0	355.4
<u>Group II</u>					
(J)	22.8	2.6	0.0	3.1	28.5
(K)	11.8	2.4	0.4	2.1	16.7
(L)	73.3	6.4	0.8	4.3	84.8
(M)	10.1	1.8	0.7	1.3	13.9
(N)	29.6	10.2	0.4	4.3	44.5
(O)	12.7	2.4	0.0	1.5	16.6
Total	160.3	25.8	2.3	16.6	205.0
Combined Total	438.9	71.9	8.0	41.6	560.4

TABLE 8-b. -- Projected 1965-66 academic staff for selected departments of Michigan State University, based on SCH productivity rates and related staffing ratios (group norms)

Dept.	FTEF (Instr.)	FTEF (Res.)	FTEF (Pro.S)	FTEF (Admin.)	FTEF (Total)
<u>Group I</u>					
(A)	33.5	5.3	0.7	3.0	42.5
(B)	33.5	5.3	0.7	3.0	42.5
(C)	9.7	1.5	0.2	0.9	12.3
(D)	26.4	4.2	0.5	2.4	33.5
(E)	9.2	1.5	0.2	0.8	11.7
(F)	69.7	11.1	1.4	6.2	88.4
(G)	27.1	4.3	0.6	2.4	34.3
(H)	47.9	7.6	1.0	4.3	60.8
(I)	<u>23.3</u>	<u>3.7</u>	<u>0.5</u>	<u>2.1</u>	<u>29.6</u>
Total	280.3	44.5	5.8	25.1	355.7
<u>Group II</u>					
(J)	25.8	4.4	0.4	2.8	33.4
(K)	7.9	1.4	0.1	0.9	10.3
(L)	72.9	12.5	1.1	8.0	94.5
(M)	7.3	1.2	0.1	0.8	9.4
(N)	32.6	5.6	0.5	3.6	42.3
(O)	<u>15.3</u>	<u>2.6</u>	<u>0.2</u>	<u>1.7</u>	<u>19.8</u>
Total	161.8	27.7	2.4	17.8	209.7
Combined Total	442.1	72.2	8.2	42.9	565.4

TABLE 8-c. -- Projected 1965-66 academic staff for selected departments of Michigan State University, based on SCH productivity rates and related staffing ratios (combined group norms)

Dept.	FTEF (Instr.)	FTEF (Res.)	FTEF (Pro.S)	FTEF (Admin.)	FTEF (Total)
<u>Group I</u>					
(A)	41.0	6.7	0.8	4.0	52.5
(B)	40.9	6.7	0.8	4.0	52.4
(C)	11.8	1.9	0.2	1.1	15.0
(D)	32.3	5.3	0.6	3.1	41.3
(E)	11.2	1.8	0.2	1.1	14.3
(F)	85.2	13.9	1.6	8.2	108.9
(G)	33.1	5.4	0.6	3.2	42.3
(H)	58.5	9.6	1.1	5.7	74.9
(I)	<u>28.5</u>	<u>4.7</u>	<u>0.5</u>	<u>2.8</u>	<u>36.5</u>
Total	342.5	56.0	6.4	33.2	438.1
<u>Group II</u>					
(J)	16.2	2.6	0.3	1.6	20.7
(K)	5.0	0.8	0.1	0.5	6.4
(L)	45.7	7.5	0.8	4.4	58.4
(M)	4.6	0.8	0.1	0.4	5.9
(N)	20.4	3.3	0.4	2.0	26.1
(O)	<u>9.6</u>	<u>1.6</u>	<u>0.2</u>	<u>0.9</u>	<u>12.3</u>
Total	101.5	16.6	1.9	9.8	129.8
Combined Total	444.0	72.6	8.3	43.0	567.9

TABLE 8-d. -- Projected and actual 1965-66 academic staff for selected departments of Michigan State University, projections based on regression analysis (total FTEF on total Fall SCH)

Dept.	Projected FTEF		Projected FTEF		Actual FTEF	
	Regular	Gr. A.	Regular	Gr. A.	Regular	Gr. A.
	(Group Norms)		(Comb. Group Norms)		(1965-66)	
<u>Group I</u>						
(A)	30.7	9.4	30.7	12.7	38.3	8.5
(B)	30.6	9.4	30.6	12.7	25.1	14.2
(C)	12.1	3.7	14.5	6.0	16.0	5.5
(D)	25.2	7.7	25.9	10.7	25.2	7.5
(E)	11.6	3.6	14.1	5.9	9.1	3.2
(F)	59.1	18.0	55.3	22.9	45.4	47.8
(G)	25.7	7.8	26.3	10.9	22.6	7.8
(H)	42.0	12.8	40.4	16.8	35.5	8.4
(I)	<u>22.8</u>	<u>6.9</u>	<u>23.8</u>	<u>9.8</u>	<u>16.0</u>	<u>8.7</u>
Total	259.8	79.3	261.6	108.4	233.2	111.6
<u>Group II</u>						
(J)	19.6	12.5	17.0	7.0	13.2	13.3
(K)	8.2	5.3	10.8	4.4	13.7	9.6
(L)	50.2	32.1	33.4	13.8	26.3	50.5
(M)	7.8	5.0	10.5	4.3	10.8	4.4
(N)	24.2	15.4	19.3	8.0	30.2	16.7
(O)	<u>13.0</u>	<u>8.3</u>	<u>13.3</u>	<u>5.5</u>	<u>12.8</u>	<u>15.8</u>
Total	123.0	78.6	104.3	43.0	107.0	110.3
Combined Total	382.8	157.9	365.9	151.4	340.2	221.9

TABLE 9-a. -- Projected 1965-66 salary budgets for selected departments of Michigan State University, based on the SCH productivity approach with alternate staffing and salary norms

Dept.	Salary Budgets ¹				
	X ₁ Y ₁ Z ₁	X ₂ Y ₂ Z ₁	X ₃ Y ₃ Z ₁	X ₁ Y ₁ Z ₂	X ₁ Y ₁ Z ₃
<u>Group I</u>					
(A)	\$582,479	\$443,962	\$527,475	\$560,234	\$587,590
(B)	352,808	441,414	523,062	341,506	356,083
(C)	159,371	127,153	149,228	154,535	161,650
(D)	482,685	412,787	486,132	442,684	410,912
(E)	154,127	131,715	153,944	155,289	144,266
(F)	794,318	914,492	1,084,763	819,990	804,712
(G)	451,496	364,255	430,025	482,711	447,815
(H)	569,323	670,310	792,736	584,636	541,408
(I)	297,771	336,196	397,121	296,856	277,088
Total	3,844,378	3,842,284	4,544,486	3,838,441	3,731,524
<u>Group II</u>					
(J)	305,499	334,662	222,052	293,139	286,934
(K)	190,362	102,132	67,794	185,460	181,344
(L)	751,098	927,639	614,403	738,416	725,476
(M)	152,525	92,895	62,655	147,987	144,772
(N)	460,328	427,877	284,102	436,827	427,946
(O)	163,840	198,857	132,159	157,402	154,320
Total	2,023,652	2,084,062	1,383,165	1,959,231	1,920,792
Combined Total	\$5,868,030	\$5,926,346	\$5,927,651	\$5,797,672	\$5,652,316

¹Based on the following normative data:

X = SCH Productivity Rates
Y = Staffing Ratios
Z = Average Salaries

1 = Departmental Norms
2 = Group Norms
3 = Combined Group Norms

TABLE 9-b. -- Projected and actual 1965-66 salary budgets for selected departments of Michigan State University, based on regression analysis (total FTEF on total SCH)

Department	Salary Budgets ¹		
	X ₂ Y ₂ Z ₁	X ₃ Y ₃ Z ₁	Actual 1965-66
<u>Group I</u>			
(A)	\$412,394	\$430,337	\$489,200
(B)	414,987	432,154	368,700
(C)	163,256	204,046	217,400
(D)	404,922	430,974	412,100
(E)	170,195	215,031	137,400
(F)	798,093	778,825	769,000
(G)	354,731	378,391	317,300
(H)	604,409	604,934	504,000
(I)	337,454	365,798	266,100
Total	3,660,441	3,840,490	3,481,200
<u>Group II</u>			
(J)	321,404	257,920	236,500
(K)	133,418	161,850	231,600
(L)	807,813	496,305	598,200
(M)	126,618	157,584	162,100
(N)	401,111	296,525	477,600
(O)	213,851	202,568	243,800
Total	2,004,215	1,572,752	1,949,800
Combined Total	\$5,664,656	\$5,413,242	\$5,431,000

¹Based on the following normative data:

X = SCH Productivity Rates
Y = Staffing Ratios
Z = Average Salaries

1 = Departmental Norms
2 = Group Norms
3 = Combined Group Norms

TABLE 10-a. -- Projected Fall, 1965, teaching units of selected departments of Michigan State University, based on the course classification approach

Dept.	Classification ¹									Total
	C ₁	C ₁₊	C ₂	C ₃	C ₄	C _{5u}	C _{5g}	C _{13, 14}	C ₁₆	
<u>Group I</u>										
(A)	61	--	148	74	34	10	--	216	--	543
(B)	121	--	--	42	5	79	--	--	--	247
(C)	20	9	48	14	--	--	12	--	--	103
(D)	34	26	49	40	--	4	12	--	--	165
(E)	16	--	17	--	--	6	--	39	--	78
(F)	81	--	152	318	--	--	15	--	--	566
(G)	28	75	10	20	51	5	30	--	--	219
(H)	94	--	3	40	96	--	12	34	--	279
(I)	57	12	30	4	--	--	4	--	--	107
Total	512	122	457	552	186	104	85	289	--	2,307
<u>Group II</u>										
(J)	8	16	29	65	20	--	8	--	--	146
(K)	10	--	16	2	--	--	5	--	80	113
(L)	51	--	16	9	26	--	5	--	573	680
(M)	22	--	6	6	--	--	1	--	40	75
(N)	32	--	82	--	--	--	16	--	62	192
(O)	24	--	18	--	--	--	--	--	60	102
Total	147	16	167	82	46	--	35	--	815	1,308
Combined Total	659	138	624	634	232	104	120	289	815	3,615
¹ C ₁ = Lecture, large C ₁₊ = Lecture, medium C ₂ = Lecture-Discussion C ₃ = Lecture-Composition C ₄ = Composition, Math C ₅ = Seminar C _{13, 14} = Laboratories, Remedial work C ₁₆ = Laboratories, Science										

TABLE 10b. -- Projected academic staff requirements of selected departments for 1965-66, based on course classifications and units-of-teaching

Dept.	Fixed Credit FTEF ¹	IND/VAR Credit FTEF ²	Administration FTEF ³	Total FTEF
<u>Group I</u>				
(A)	74.9	1.7	3.1	79.7
(B)	34.1	1.9	1.4	37.4
(C)	14.2	3.2	0.7	18.1
(D)	22.8	2.5	1.0	26.3
(E)	10.8	4.1	0.6	15.5
(F)	78.1	1.7	3.2	83.0
(G)	30.2	3.1	1.3	34.6
(H)	38.5	11.4	2.0	51.9
(I)	14.8	7.1	0.9	22.8
Total	318.4	36.7	14.2	369.3
<u>Group II</u>				
(J)	20.1	0.5	0.8	21.4
(K)	15.6	1.8	0.7	18.1
(L)	93.8	2.0	3.8	99.6
(M)	10.3	2.3	0.5	13.1
(N)	26.5	2.6	1.2	30.3
(O)	14.1	1.3	0.6	16.0
Total	180.4	10.5	7.6	198.5
Combined Total	498.8	47.2	21.8	567.8

¹Fixed Credit FTEF based on 7.25 teaching units per FTE

²IND/VAR Credit FTEF based on 36:1 and 25:1 ratios at undergraduate and graduate levels, respectively.

³Administration based on a 25:1 ratio of Fixed Credit and IND/VAR credit FTEF to Administrative FTEF

TABLE 10-c. -- Projected academic staff requirements of selected departments for 1965-66, based on course-classification and credits-of-teaching

Dept.	Fixed Credit FTEF ¹	IND / VAR Credit FTEF ²	Administration FTEF ³	Total FTEF
<u>Group I</u>				
(A)	78.3	1.7	3.2	83.2
(B)	39.2	1.9	1.6	42.7
(C)	16.4	3.2	0.8	20.4
(D)	26.2	2.5	1.1	29.8
(E)	11.0	4.1	0.6	15.7
(F)	89.9	1.7	3.7	95.3
(G)	34.8	3.1	1.5	39.4
(H)	43.0	11.4	2.2	56.6
(I)	<u>17.0</u>	<u>7.1</u>	<u>1.0</u>	<u>25.1</u>
Total	355.8	36.7	15.7	408.2
<u>Group II</u>				
(J)	23.1	0.5	0.9	24.5
(K)	11.6	1.8	0.5	13.9
(L)	62.6	2.0	2.6	67.2
(M)	8.7	2.3	0.4	11.4
(N)	25.6	2.6	1.1	29.3
(O)	<u>11.4</u>	<u>1.3</u>	<u>0.5</u>	<u>13.2</u>
Total	143.0	10.5	6.0	159.5
<u>Combined</u>				
Total	498.8	47.2	21.7	567.7

¹Fixed credit FTEF based on 6.29 credits of teaching per FTE.

²IND/VAR Credit FTEF based on 36:1 and 25:1 ratios at undergraduate and graduate levels respectively.

³Administration based on a 25:1 ratio of Fixed Credit and IND/VAR Credit FTEF to Administrative FTEF.

TABLE 11-a. -- Projected 1965-66 salary budgets for selected departments of Michigan State University, based on the course classification approach with alternate staffing and salary norms (units-of-teaching)

Dept.	Salary Budgets ¹				
	X ₁ Y ₁ Z ₁	X ₁ Y ₂ Z ₁	X ₁ Y ₃ Z ₁	X ₁ Y ₁ Z ₂	X ₁ Y ₁ Z ₃
<u>Group I</u>					
(A)	\$852,514	\$832,195	\$800,517	\$820,001	\$860,030
(B)	358,308	387,638	373,228	346,810	361,619
(C)	187,296	187,311	180,161	181,614	189,974
(D)	340,937	323,001	309,561	312,660	290,210
(E)	178,993	174,374	167,480	180,351	167,528
(F)	810,047	859,256	826,659	836,211	820,644
(G)	370,436	365,893	352,333	396,039	367,424
(H)	607,324	572,464	549,063	623,642	577,544
(I)	261,772	258,953	248,061	260,969	243,622
Total	3,967,627	3,961,085	3,807,063	3,958,297	3,878,595
<u>Group II</u>					
(J)	229,116	214,690	229,670	219,852	215,202
(K)	206,602	179,014	192,442	201,260	196,788
(L)	882,384	978,141	1,046,973	867,481	852,276
(M)	143,780	129,536	139,143	139,505	136,475
(N)	313,275	306,658	329,075	297,256	291,215
(O)	158,191	160,756	172,036	151,957	148,974
Total	1,933,348	1,968,795	2,109,339	1,877,311	1,840,930
Combined Total	\$5,900,975	\$5,929,880	\$5,916,402	\$5,835,608	\$5,719,525

¹Based on the following normative data:

X = Course Classification
Y = Staffing Ratios
Z = Average Salaries

1 = Departmental Norms
2 = Group Norms/College Salaries
3 = Combined Group Norms/
University Salaries

TABLE 11-b. -- Projected 1965-66 salary budgets for selected departments of Michigan State University, based on the course classification approach with alternate staffing and salary norms (credits-of-teaching)

Department	Salary Budgets ¹		
	X ₁ Y ₁ Z ₁	X ₁ Y ₂ Z ₂	X ₁ Y ₃ Z ₃
<u>Group I</u>			
(A)	\$890,362	\$841,106	\$839,510
(B)	409,540	431,510	431,057
(C)	211,350	206,124	205,847
(D)	385,855	339,033	301,137
(E)	180,719	178,514	158,534
(F)	929,832	1,026,210	961,796
(G)	421,987	448,549	398,051
(H)	662,969	644,578	570,898
(I)	288,342	285,526	253,160
Total	4,380,956	4,401,150	4,119,990
<u>Group II</u>			
(J)	262,526	236,611	247,150
(K)	170,016	134,774	139,842
(L)	565,491	649,372	678,208
(M)	160,422	110,342	115,133
(N)	303,064	283,489	295,608
(O)	130,941	128,133	133,162
Total	1,592,460	1,542,721	1,609,103
Combined Total	\$5,973,416	\$5,943,871	\$5,729,093

¹Based on the following normative data:

X = Course Classification
Y = Staffing Ratios
Z = Average Salaries

1 = Departmental Norms
2 = Group Norms/College Salaries
3 = Combined Group Norms/
University Salaries

BIBLIOGRAPHY

BIBLIOGRAPHY

A. BOOKS

- American Association of Collegiate Registrars and Admissions Officers. Handbook of Data and Definitions in Higher Education. American Association of Collegiate Registrars and Admissions Officers, 1962.
- Briggs, John F. A Refined Program Budget for State Governments. Washington: Center for Technology and Administration, The American University, 1962.
- Budget Director's Office. Analysis of Legislative Budgets: University System of the State of Florida--1961-63. Tallahassee: Budget Director's Office, 1961.
- Burkhead, Jesse. Government Budgeting. New York: John Wiley and Sons, Inc., 1956.
- California and Western Conference Cost and Statistical Study. Berkeley: University of California, n.d.
- Dodds, Harold W. The Academic President. New York: McGraw-Hill Book Co., Inc., 1962.
- Evans, John M. and Hicks, John W. An Approach to Higher Educational Cost Analysis. No. XCI, 'Studies in Higher Education.' Lafayette: Division of Educational Reference, Purdue, University, 1961.
- Glaze, Thomas E. Business Administration for Colleges and Universities. Baton Rouge: Louisiana State University Press, 1962.
- Glenny, Lyman A. Autonomy of Public Colleges: The Challenge of Coordination. New York: McGraw-Hill Book Co., Inc., 1959.
- Harris, Seymour E. Higher Education: Resources and Finance. New York: McGraw-Hill Book Co., Inc., 1962.
- Hill, David S. and Kelley, Fred J. Economy in Higher Education. New York: The Carnegie Foundation for the Advancement of Teaching, 1933.

- Huff, Darrell. How to Lie with Statistics. New York: W. W. Norton and Company, Inc., 1954.
- Hungate, Thad L. Finance in Educational Management of Colleges and Universities. New York: Bureau of Publications, Teachers College, Columbia, University, 1954.
- Kammerer, Gladys M. Program Budgeting: An Aid to Understanding. Civic Information Series, No. 32. Gainesville: Public Administration Clearing Service, University of Florida, 1959.
- Keezer, Dexter M.(ed.). Financing Higher Education: 1960-70. New York: McGraw-Hill Book Co., Inc., 1959.
- Miller, James L. Jr. State Budgeting for Higher Education. Ann Arbor: Institute of Public Administration, The University of Michigan, 1964.
- Millett, John D. The Academic Community. New York: McGraw-Hill Book Co., Inc., 1962.
- Russell, John Dale. Finance of Higher Education, Rev. Ed. Chicago: University of Chicago Press, 1954.
- The Fund for the Advancement of Education. Better Utilization of College Teaching Resources. New York: The Fund for the Advancement of Education, 1959.
- Western Interstate Commission for Higher Education. Quality and Opportunity in Higher Education. Boulder: Western Interstate Commission for Higher Education, 1959.
- _____. Studies of College Faculty. Boulder: Western Interstate Commission for Higher Education, 1961.
- _____. Yardsticks and Formulas in University Budgeting. Boulder: Western Interstate Commission for Higher Education, 1959.
- Williams, Harry. Planning for Effective Resource Allocation in Universities. Washington: Commission on Administrative Affairs, American Council on Education, 1966.

B. ARTICLES AND PERIODICALS

Buechner, John C. "Performance Budgeting," Michigan Municipal Review, Fall, 1962.

Carpenter, C. R. "Imaginative Alternatives to Our Present Methods of Extension Work," College and University Business, September, 1960.

Hudson, Cathryn Seckler. "Performance Budgeting in the Government of the United States," Public Finance, Vol. VII, No. 4.

Ikenberry, Stanley. "Instructional Cost and Quality," College and University, Spring, 1962.

Kelley, Fred J. "Adequate Cost Analysis as a Basis for Budget Making," Journal of Educational Research, May, 1923.

Milwaukee Journal, June 24, 1965.

Nance, Paul K. "Unit Cost Analysis as a Key to Budget Adjustment," College and University Business, March, 1952.

Sherwood, Frank. "Some Non-Cost Accounting Approaches to Performance Budgeting," Public Management, January, 1954.

Walker, Ernest W. "To Measure Operating Efficiency," College and University Business, August, 1960.

Williams, Robert L. "Instructional Cost Studies in Perspective," College and University Business, March, 1959.

Wilson, Logan. "Analyzing and Evaluating Costs in Higher Education," The Educational Record, April, 1961.

C. UNPUBLISHED MATERIALS

Cammack, Elwin F. "A Projection of Student Credit Hours by Department, for 1967-68 and 1972-73," East Lansing: Office of Institutional Research, Michigan State University, November, 1963, (Mimeo.).

Manual for the Preparation of Uniform Cost Reports: Michigan State Colleges and Universities. Lansing: Michigan Council of State College Presidents, 1962, (Ditto).

Michigan Council of State College Presidents. Unit Cost Study: Instruction and Departmental Research. Lansing: Michigan Council of State College Presidents, June, 1965, (Mimeographed).

Office of Institutional Research. Section Size Analysis, Fall Term(s) 1962-64. East Lansing: Office of Institutional Research, Michigan State University, March, 1963, 1964, 1965.

_____. Teaching Load and Time Distribution Analysis, Fall Term(s), 1962-64. East Lansing: Office of Institutional Research, Michigan State University, March, 1963, 1964, 1965.

_____. Volume of Instruction Analysis, Fall Term(s), 1962-64. East Lansing: Office of Institutional Research, Michigan State University, March, 1963, 1964, 1965.

Office of the Chancellor. 1964-65 Status Report of the California State Colleges -- Part G: Fall Instructional Faculty. Inglewood: Office of the Chancellor, California State Colleges, January, 1965.

Peters, John S. "Genesis: The Faculty Staffing Formula," Sacramento: Educational Planning Office, Division of State Colleges and Teacher Education, California State Department of Education, June, 1961, (Mimeographed).

Saupe, Joseph L. "A Technique for Projecting College or University Instructional Loads," East Lansing: Office of Institutional Research, Michigan State University, June, 1966, (Mimeographed).

_____. "Relationships Among Various Measures of Teaching Load -- from Fall 1962 Faculty Load Data," East Lansing: Office of Institutional Research, Michigan State University, n.d., (Typescript).

MICHIGAN STATE UNIV. LIBRARIES



31293105476901