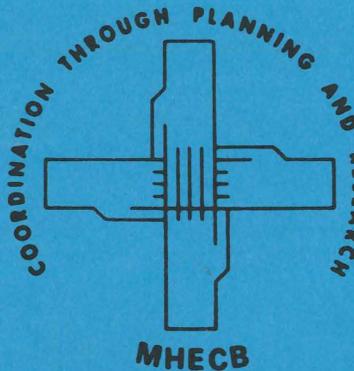




A POLICY PAPER



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STATE FUNDING OF POST-SECONDARY EDUCATION
IN THE 1980s AND BEYOND:
AN EXAMINATION OF CURRENT PRACTICES AND ALTERNATIVES

Prepared by the Staff of the
Minnesota Higher Education Coordinating Board
for the
Annual Meeting of the Post-Secondary Education Governing Boards

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TABLE OF CONTENTS

	<u>Page</u>
SUMMARY	iii
THE ISSUE	1
The Purpose	2
BACKGROUND	2
Goals for Post-Secondary Education	6
Review of State Budgeting Types	7
Object of Expenditure Budgeting	8
Program Budgeting	9
Performance Budgeting	10
Formula Budgeting	11
MINNESOTA PRACTICES AND THEIR IMPLICATIONS	14
Minnesota Funding Procedures	14
Minnesota Funding Policies	16
Enrollment Bulge Policy	16
Student Growth or Decline Factor	16
Special Appropriations	17
Core Funding Policy	17
System Internal Reallocation Policies	18
Implications of Minnesota's Funding Policies	21
ALTERNATIVE FUNDING POLICIES	23
Average Cost Funding Policy	23
Marginal Cost Funding Policy	26
Fixed and Variable Cost Funding Policy	28
Minimum Core Funding Policy	30
Performance Related Funding Policy	31
Summary	32
CONCLUSION	33

LIST OF TABLES AND FIGURES

<u>Table</u>	<u>Page</u>
1 Relative State Investment in Minnesota Public and Private Post-Secondary Education	5
2 Projected Constant Dollar Expenditures and Unclassified Staffing Based on Current Enrollment Related Funding and Staffing Relationships	24
3 Impact of Funding Policies on Accomplishment of State Goals	27
4 Linear Regression Coefficient of Determination	A2

Figure

1 FYE Enrollments and Total Expenditures in Constant Dollars for Fiscal Years 1971-1977	20
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SUMMARY

Many conditions affect the support for post-secondary education in Minnesota. They include the projected enrollment declines, high inflation, escalating energy costs and public pressure to control government expenditures. Public post-secondary education headcount enrollments are projected to begin dropping in 1983 and are not expected to stabilize until 1996 when there will be approximately 39,000 to 41,000, or 25% to 28%, fewer students than there are now.

Historically, there has been a close relationship between state funding for post-secondary education and enrollments in Minnesota. As enrollments have increased, support and staff have been added on a proportional basis. Strict budget formulas, however, have not been implemented in Minnesota. Several different funding policies have been used to cope with the financing problems caused by enrollment fluctuations. The long-range implications of these alternative funding policies seem to indicate that a more comprehensive policy is needed to serve the best interests of the state in a period of enrollment decrease. Consequently, a number of alternative financing policies should be considered. They include average cost funding, marginal cost funding, fixed and variable cost funding, minimum core funding and performance related funding. These alternatives and others need careful review and evaluation in terms of state goals for post-secondary education and our commitment to maintaining needed services for the residents of Minnesota.

The vitality and quality of post-secondary education in Minnesota may be seriously threatened during the next two decades unless state

decision-makers and governing boards can develop funding policies for coping with the projected enrollment decline and the other factors which have been identified. Governing boards, administrative staffs and faculty will be challenged to manage limited resources carefully to control costs and to allocate support to high priority programs. This will require the development of clear goals which relate multiple system and institution missions to the public interest. Recognition of the long-term consequences of present decisions and policies will be required. If support for post-secondary education is allowed to decrease without the necessary planning to support critical decisions and if systems and institutions fail to manage their resources effectively, then the quality of post-secondary education in Minnesota will be threatened and possibly diminished.

STATE FUNDING OF POST-SECONDARY EDUCATION
IN THE 1980s AND BEYOND:
AN EXAMINATION OF CURRENT PRACTICES AND ALTERNATIVES

THE ISSUE

Minnesota has a vital interest in how state funding policies and procedures affect the quality and variety of post-secondary education in the 1980s and beyond. Minnesota's current funding policies and procedures were developed in a period of enrollment growth and fiscal prosperity. As enrollments decline in the 1980s, the continuation of current funding policies may affect Minnesota post-secondary education adversely.

While the enrollment declines projected for the 1980s and 1990s will affect the funding of post-secondary education, changing economic and social conditions also will have a significant impact on funding. Inflation will certainly continue, although, perhaps, not at its current rate. The era of inexpensive and readily available energy is past. Continued public sentiment against increased governmental spending could limit the availability of public resources in Minnesota. Moreover, how society views post-secondary education may affect the amount of financial support and the distribution of resources.

Given these projected trends and conditions, a major question is whether state funding policies and procedures for post-secondary education developed during a period of relative prosperity and growth will best serve the public interest in this period of fiscal constraint and institutional contraction. The issue, then, is how should post-secondary education institutions be funded in the 1980s and beyond.

The Purpose

The purpose of this paper is to examine the implications of the changing trends and conditions, specifically the enrollment declines, on the financing of post-secondary education in Minnesota. The paper includes the following:

1. A discussion, in general terms, of budgeting types used by states for financing public post-secondary education institutions and a discussion of formula funding methods, including their advantages and disadvantages;
2. A discussion of financing policies and procedures used by Minnesota to finance its public post-secondary institutions and the implications of the policies and procedures; and
3. An examination of alternative funding policies and their implications in the context of how they affect the state's ability to meet its goals for post-secondary education.

BACKGROUND

Headcount enrollments in Minnesota's four public post-secondary education systems increased by more than 103,000, or 200%, between 1960 and 1978. They are projected to decline by approximately 39,000 to 41,000, or 25% to 28%, from 1979 to 1996, according to Board analyses. Enrollment projections for private collegiate institutions in Minnesota, based on current attendance patterns, indicate that private institutions will experience a similar enrollment trend during the next two decades. Such significant fluctuations in enrollments complicate the funding of post-secondary education. Current funding policies and procedures were developed largely in a period of enrollment growth and may not adequately fund institutions in a period of enrollment declines.

The result of these projected enrollment declines may be staffing and funding reductions in constant dollars. Any type of institutional contraction is a difficult process, and reductions in post-secondary education are no exception. Difficult decisions will be required to reduce the scope of program offerings. Program modifications necessary to meet changes in demand or perceived need will be more difficult in a period of funding and staffing reductions. If faculty reductions occur at the lowest seniority levels, the remaining higher-salaried senior faculty will tend to cause increased average salary expenditures. A majority of senior faculty will reduce the opportunity of junior faculty for professional advancement. Faculty reductions combined with few, if any, new faculty hired will tend to retard any past progress toward affirmative action goals.

The fact that post-secondary education has just come through a period of substantial enrollment growth magnifies the problems of contraction. Multiple and competing objectives are easier to accomplish when additional funding and staff are added annually. Compounded by inflation, energy and limited public resources, the challenge facing most post-secondary institutions in the 1980s will be to continue to accomplish their objectives and serve their clientele effectively while contracting.

Basic research is an integral part of the University of Minnesota's mission and instructional faculty are involved in research. Although the research may not always be related to instruction, as enrollments decline, reductions in the scope of research may be necessary due to faculty reductions.

In some respects, funding and staffing reductions will be more difficult for small institutions because of their small scale and limited

resources. A 25% reduction in staffing might leave some small institutions with fewer staff than are necessary to provide a minimum range of instruction and support programs. This problem is particularly acute in Minnesota which has many small institutions. Data for 1976 indicated that 9% of the 909 public two-year institutions in the United States enrolled fewer than 700 students.¹ The comparable figure for Minnesota two-year institutions was 35%. Of Minnesota's 63 public post-secondary institutions, 28 enrolled fewer than 700 students in the fall of 1978. By the fall of 1996, 32 Minnesota public post-secondary institutions are projected to enroll fewer than 700 students.

Private post-secondary education institutions, most of which rely on tuition and fees for the majority of their revenue, will be severely affected by projected enrollment declines. Minnesota private post-secondary institutions receive funding from the state through the Private College Contract Program and indirectly through the state Scholarship and Grant-in-Aid Programs. These two sources provided 8.2% of the private institutions' total revenue in Fiscal Year 1977. Table 1 illustrates Minnesota's investment in the public and private sectors of post-secondary education. The state funding of the private institutions constituted 3.47% of the state's investment while the funding to public systems constituted 96.53% of the state's investment.

System and institutional management will be a major factor in the success with which Minnesota's post-secondary education sectors meet the difficulties of the 1980s. Institutions will need clearly defined

¹A Classification of Institutions of Higher Education, the Carnegie Council on Policy Studies in Higher Education, the Carnegie Foundation, 1976.

TABLE 1

RELATIVE STATE INVESTMENT IN MINNESOTA PUBLIC AND PRIVATE POST-SECONDARY EDUCATION
FISCAL YEAR 1978

<u>System</u>	<u>Enrollments</u>	<u>State Funds for Operating Expenditures and Financial Aid⁵</u>	<u>Percent of Total</u>
University of Minnesota	48,209 ¹	\$188.6 (millions)	49.19%
State University System	33,891 ¹	70.0 (millions)	18.26
Community College System	20,269 ¹	30.9 (millions)	8.06
Area Vocational-Technical Institutes	31,401 ²	80.7 (millions)	21.05
Private Colleges	33,359 ³	13.3 (millions)	3.47
TOTAL		\$383.4 (millions)	100.00% ⁴

1 FY 1978 full-year equivalent actual appropriations defined enrollment.

2 FY 1978 average daily membership enrollment.

3 Fall 1978 full-time equivalent enrollment for those institutions participating in the Private College Contract Program.

4 Percentages do not total 100.00% due to rounding.

5 Financial aid includes State Scholarship, Grant-in-Aid and Work Study Programs.

missions and objectives on which to base decisions about the reallocation of resources when contraction occurs.

Clearly, the executive and legislative response to declining enrollments will be the major factor in the development of new or modified policies for post-secondary education. It may be necessary to reassess not only the method of direct state funding to systems and institutions but also other state funding policies and programs for post-secondary education, including the level of state support to public and private systems and institutions, student financial aid programs, reciprocity programs and tuition policy. To the extent that fiscal constraints permit, the state should fund all aspects of its post-secondary education sectors in a manner which minimizes the adverse effects of the changing trends and conditions of the 1980s and beyond.

Goals for Post-Secondary Education

Several state-level goals for post-secondary education have been identified from current practice, past Board policy recommendations and historical legislative and executive appropriations and policy decisions. These goals provide a framework for the evaluation of state policies regarding post-secondary education. It may be the case that attempts to achieve one goal may impair the achievement of another goal. Further, as the state's resources become more limited, it may not be possible to achieve each of the goals to the extent desired. While a detailed specification of the goals and their priorities is subject to debate, the following general statement of the goals will be used to assess alternative funding policies:

Student Access - Minnesota residents should be able to enroll in and complete some form of post-secondary education that is appropriate to their needs.

Choice - Individuals should have a reasonable choice among those institutions which have accepted them for admission.

Educational Diversity - Systems and institutions should provide a diverse set of instructional programs and institutional settings.

Educational Quality - Systems and institutions should seek the highest possible quality in all their programs.

Efficiency - Public resources should be used efficiently and effectively.

Financing - The state must provide sufficient or adequate resources for post-secondary education to meet its responsibilities effectively.

The state's ability to achieve these goals could be affected significantly by the method or methods it chooses for funding post-secondary education.

Review of State Budgeting Types

Several state-level budgeting practices have been identified in reports about public budgeting. In State Budgeting for Higher Education, Purves and Blenny condensed these practices into the following four types of state-level budgeting for post-secondary education: (1) object of expenditure budgeting, (2) program budgeting, (3) performance budgeting, and (4) formula budgeting.² These four types should be viewed as abstract or theoretical types. They are not mutually exclusive and in

²Ralph A. Purves and Lyman A. Glenny, State Budgeting for Higher Education: Information Systems and Technical Analysis, Center for Research and Development in Higher Education, University of California, Berkeley, 1976, pp. 44-77.

actual practice, most states use a mixture of these four types.³ Further, these four types can be viewed as either incremental/decremental or zero based/comprehensive in their extent of budget review.

An incremental/decremental review focuses primarily on the differences between the base, the previous year's budget, and the budget being considered. Although some consideration of items in the "base" may occur, the incremental/decremental type stresses review of increases/decreases from the base. Political conflict is minimized in an incremental/decremental budget review since the majority of base expenditures are overlooked. Although the amount of data preparation and analysis required to review year to year changes is less than that required for comprehensive reviews, the result is a less comprehensive data base.

The zero based/comprehensive review, conversely, does not necessarily fund budget items simply because they were supported the previous year. In the ideal form of zero based budgeting, all proposed expenditure items are reviewed as if they were proposed new expenditures. In reality, such an all encompassing review is prohibitively time consuming. Many states conduct a zero based review of certain expenditure items within the base in lieu of such a review of the entire base.⁴

The following are brief descriptions of the four budgeting types:

Object of Expenditure Budgeting

In object of expenditure budgeting, funds are requested according to the categories in which they will be expended. Thus, only the inputs (e.g., personnel, expenses, supplies, equipment, etc.) are reviewed. Knowledge of state personnel and administrative

³Ibid.

⁴Ibid.

procedures and rules tends to be emphasized in this type of budgeting. The primary comparisons are between proposed and previous expenditures within the object categories. Object of expenditure budgeting enhances oversight of agencies' expenditures throughout the budget year. Object of expenditure data categories are often used within other types of budgeting to provide supplemental data.

Program Budgeting

Program budgeting is characterized by the consideration of objectives and/or actual outputs of agency activities. The decision is whether a particular program should be funded or not rather than considering only the level at which it will be funded. Such consideration of objectives and outputs tends to make policy decisions more explicit. Planning is frequently a part of program budgeting. The planning may take the form of an identification of long-range objectives and possible methods for accomplishing them. Short-range planning, such as coordination of joint efforts or planning for contingencies, may also be a part of program budgeting.

Program, Planning and Budgeting Systems (PPBS), a formalized version of program budgeting, usually exhibits the following five components: (1) budgetary information is organized into programs, categories of activities with similar purposes; (2) alternative methods of accomplishing objectives are presented; (3) the implications of decisions to be made now are illustrated in multi-year projections; (4) analytical studies, including cost effectiveness and cost benefit analysis, are used; (5) follow-up studies are conducted to assess goal accomplishment.

Although program budgeting sounds beneficial in theory, its implementation has not been successful. PPBS was implemented by the federal government and by several states, and the results have been reported widely and debated. Aaron Wildavsky, in his book on budgeting, stated that, "PPBS has failed."⁵ PPBS focuses attention on policy decisions but neglects the implementation of those decisions, according to Pyhrr.⁶ The consensus seems to be that while the implementation of PPBS as a budgeting method has not been very successful, its basic concepts may prove to be a useful addition to budgeting practice.

Performance Budgeting

Performance budgeting centers on activities and functions which use inputs and produce outputs. In focusing upon activities, the emphasis is placed upon the intermediate step between inputs and outputs. This distinguishes performance budgeting from object of expenditure budgeting, which emphasizes input, and from program budgeting, which emphasizes outputs. The primary purposes of performance budgeting are to (1) provide incentives for improved performance by relating funding more directly to performance and (2) to encourage efficiency. Performance budgeting is characterized by the use of (1) activity classifications (instruction, for example), (2) performance indicators which relate inputs to outputs (student credit hours), and

⁵ Aaron Wildovsky, Budgeting: A Comparative Theory of Budgeting Processes, Boston, Little Brown, 1975, p. 163.

⁶ Peter A. Pyhrr, Zero-Based Budgeting, New York, John Wiley and Sons, 1973, p. 149.

(3) performance reports which compare budget projections with actual occurrences.⁷

The development of performance indicators which truly measure the relationship between inputs and outputs has been a major drawback to the implementation of performance funding. The causal relationship between dollars appropriated and outcomes desired is frequently unclear.

Formula Budgeting

Formula budgeting differs from performance budgeting in that performance indicators (i.e., formulas) are used by agencies in preparing their budget requests. The performance indicators used in the formulas should be widely accepted by all participants in the budgeting process. Purves and Glenny identified three necessary characteristics in a formula budgeting process: (1) a method to derive costs or workload factors, (2) institution or system budget requests are derived using formulas, as opposed to applying formulas later, and (3) consensus by budget process participants that the formula-derived budget levels are appropriate. Budget review under formula budgeting tends to be simplified since there is agreement on the formula.⁸

Formula budgeting in post-secondary education at the state level is a comparatively recent development. In 1951, formulas were first used in the preparation of institutional budget requests, or the determination of state appropriations to post-

⁷Allen Shick, Budget Innovation in the States, Washington, D.C., Brookings Institution, 1971, p. 48.

⁸Purves and Glenny, pp. 44-77.

secondary education, by four states.⁹ The use of budgeting formulas grew significantly and by 1973, 25 states were using a formula at some point in their budgeting process.¹⁰ Between 1973 and 1977, five states discontinued their use of formulas while two states began using them.¹¹ The increase in the use of formulas may, in part, be due to their perceived advantages, which have been identified as:

1. Budget formulas can be developed on the basis of quantitative data.
2. Budget formulas have the potential for reducing...competition among institutions for state funds...
3. Budget formulas have the potential for assuring each institution of an equitably determined operating base appropriation...
4. Budget formulas provide state officials with a reasonably simple and understandable basis for deciding upon and presenting the financial requirements of higher education.
5. Budget formulas represent a compromise between state control... and institutional fiscal autonomy.¹²
6. Perhaps most importantly, appropriations decisions are based on policy decisions arrived at openly.

On the other hand, certain disadvantages do exist:

1. Budget formulas have difficulty addressing quality.
2. A budget formula is limited in its ability to estimate... funding requirements...by how well the formula factors represent reality...

⁹James L. Miller, State Budgeting for Higher Education: The Use of Formulas and Cost Analysis, The University of Michigan Governmental Studies, No. 45, Ann Arbor, Institute of Public Relations, 1964, pp. 53-79.

¹⁰Francis M. Gross, A Comparative Analyses of the Existing Budget Formulas (unpublished Doctoral Dissertation), The University of Tennessee, 1973, p. 41.

¹¹Francis M. Gross, "Formula Budgeting and the Financing of Public Higher Education: Panacea or Nemesis for the 1980's," The A.I.R. Professional File, Fall 1979, No. 3.

¹²Gross, 1973, p. 197.

3. Budget formulas, if used to achieve equity, can have a "leveling" effect upon the quality of education.
4. Budget formulas may perpetuate inadequate operating appropriations by design or not, depending upon the point in time selected as a base.
5. Budget formulas, through their reliance upon base and formula factors, historical costs and arbitrary assumptions, are an enticement for institutions to...manipulate data and programs in order to maximize their incomes.¹³

None of these four types of budget review possess advantages which make it most appropriate for use during periods of enrollment decline. Object of expenditure budgeting, although it supports the budget control function, tends to obscure policy issues raised by enrollment declines. Program budgeting, although it focuses on policy issues, if practiced as described, requires enormous amounts of time preparing voluminous information. Further, it is not clear that the information, once assembled, has an impact on decision-making.¹⁴ Finally, program budgeting has not been implemented successfully. Performance budgeting, by relating funding more directly to performance, where practical, may provide incentives for improved performance during a period of enrollment declines. The difficulty, though, is in developing accurate performance indicators. Formula budgeting has the potential for assuring equitable treatment of each institution and simplifying the budgeting process. However, it is not clear that equity and simplicity will best serve the state during enrollment declines. Further, formula budgeting has difficulty in addressing quality.

Incremental budget reviews, in focusing on the change in expenditures from year to year, seem to recognize the lack of short run

¹³Gross, 1973, pp. 197-198.

¹⁴Purves and Glenny, p. 82.

flexibility in post-secondary education institutional expenditures. However, since flexibility in expenditures does exist in the long run, focusing entirely upon incremental changes may not be the most appropriate review technique during extended enrollment declines. It also may be wise to incorporate, at least to some extent, a more comprehensive review of expenditures. No single type of budgeting or extent of review is the best suited for use during enrollment declines. Rather, a mixture of the most desirable aspects of each type and extent may be most appropriate.

MINNESOTA PRACTICES AND THEIR IMPLICATIONS

Minnesota Funding Procedures

Current Minnesota funding procedures and policies are the point of departure for a discussion of state funding for post-secondary education. The biennial budget process begins in the spring of each even-numbered year. The governor, through the Department of Finance, prepares budget guidelines to be used by all agencies, including the post-secondary systems, in preparing their budget requests. Through the guidelines, the governor can influence the form and amount of the budget requests and introduces his policies into the process. The budget requests are prepared by the board staffs and then deliberated and approved by each governing board. At this point, the board staffs and governing boards make policy proposals. In fall, the budget requests are submitted to the governor. The governor has a primary impact in making the budget recommendations to the legislature. The legislature, considering both the systems' requests and the governor's recommendations, makes the final decision, establishing the state appropriations and the total spending authority for each system.

Appropriations to the collegiate systems for the instructional portion of the budget have been based on a faculty staffing ratio, with adjustments made for salary and fringe benefit increases and inflationary increases for supplies, expenses and equipment. Appropriations to the area vocational-technical institutes for the instructional portion of the budget have been based largely on a uniform aid amount per student from the previous year with adjustment for inflation and, to a smaller extent, on a categorical aid appropriation which is allocated by the State Department of Education.

The decision-making process used in arriving at the levels of state appropriations and total spending authority is largely an incremental one. The majority of the deliberations occurring during the decision-making process regard the systems' requested change and the governor's recommended change from the previous year's base funding level; i.e., new money. The change generally consists of three types: (1) enrollment related, (2) new programs, and (3) quality improvements. The previous year's base funding level is the starting point and usually is not examined in detail. The amount of state appropriations and total spending authority are determined primarily by the previous year's budget and the perceived availability of state revenue.

The type of budget review used for post-secondary education in Minnesota follows the pattern of other states--a mixture of object of expenditure, program budgeting, performance budgeting and formula budgeting.¹⁵ The budget is organized along a program format with objectives and performance indicators displayed for each activity. The Private College Contract and the policy established by the 1979 Legislature to

¹⁵Ibid., p. 44.

provide incentives for the University of Minnesota to obtain more federal grants are examples of performance funding in Minnesota. Within budget activities, expenditure data are displayed in object of expenditure groups. Finally, some elements of formula budgeting, staffing ratios, expenditures per student, etc. have been used by systems in preparing their budget requests and by the legislature for comparison purposes.

Minnesota Funding Policies

Consideration has been given to planning for the projected enrollment decline facing post-secondary education and in recent years, specific decisions have been made by the legislature and actions have been taken by the systems to cope with the phenomenon. There are also funding policies in use which may prove useful for coping with the enrollment declines, though that was not their original intent.

Enrollment Bulge Policy

In the collegiate sector, for example, an "enrollment bulge policy" was implemented by the legislature in 1977. The policy was developed to accommodate a small enrollment increase in the late 1970s and early 1980s, which is preceding the anticipated enrollment decline. Under this policy, beginning with the 1977-79 biennium, the three public collegiate systems received no additional state appropriations for enrollments over the 1977 enrollment base. The systems were directed by the legislature to fund enrollment increases out of temporary, additional tuition income.

Student Growth or Decline Factor

The legislature also has modified the funding formula for the AVTIs to offset enrollment decreases. Beginning in Fiscal Year 1981,

the second year of the biennium, a "student growth or decline factor" will be included in the newly established funding formula. The factor has the effect of reducing fluctuations in funding levels which result from large (over 5%) year-to-year variations in enrollment levels. To some extent, such funding fluctuations were reduced through the allocation of categorical aid, but this factor formalizes the process. In a long-term enrollment decline, the factor would tend to postpone the effects of the decline on funding.

Special Appropriations

Special appropriations have been provided by the legislature to the University of Minnesota and, on a smaller scale, to the other public systems. The University of Minnesota received \$35.6 million in special appropriations in Fiscal Year 1978. These special appropriations fund research, other non-enrollment related activities and instructional activities which would probably not occur without special support. The state universities receive special appropriations for Nursing and Special Education instruction. In a period of enrollment declines, a special funding policy such as this could be applied to programs with high legislative priority which may lose funding under an enrollment related funding policy.

Core Funding Policy

A fourth example of state policies to cope with enrollment declines is the staffing/funding policy implemented at Southwest State University. When enrollments declined by almost 50% and continued formula based staffing and budget reductions threatened the academic viability of that institution, a core funding policy

was implemented. Under this policy, Southwest was provided an essentially fixed staffing level and budget adequate to fund a revised structure of academic and support programs. Based on this policy, the institution will not lose staff if enrollments decline below current levels. Conversely, Southwest must accommodate any enrollment increases which may occur and will not receive additional staffing or other budget support until its staffing ratios reach those in effect for the other state universities. In addition, the State University System and the Community College System have internal budget allocation policies regarding core staffing and budget support for basic administrative and support services for all institutions within those systems. Core allocations are provided each institution, and additional support is allocated as enrollments increase above specified levels.

System Internal Reallocation Policies

The University of Minnesota and the Community College System have made decisions or adopted policies for the internal reallocation of funds and staff which constitute policies to cope with enrollment declines.

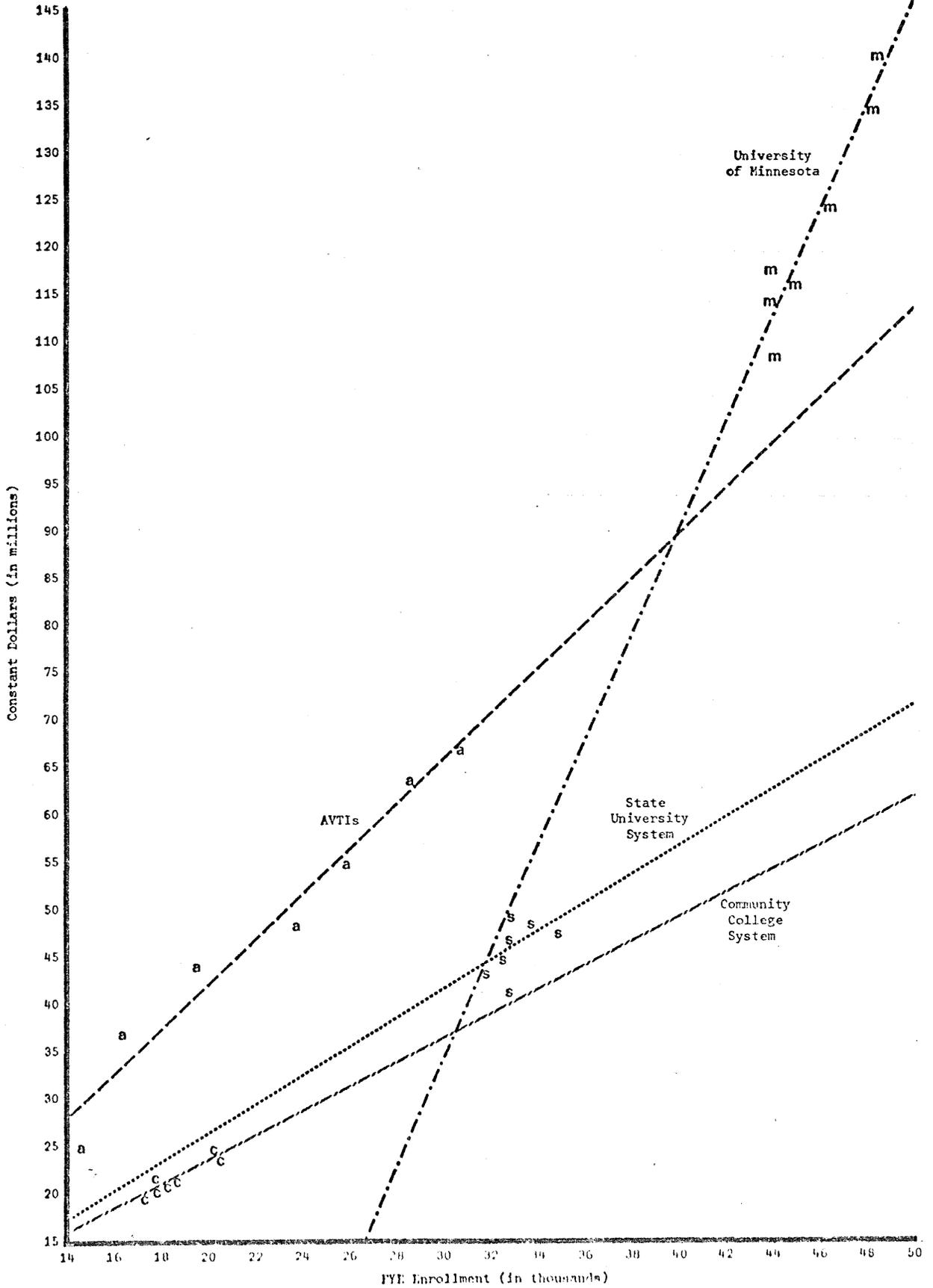
The University of Minnesota has adopted a systemwide internal planning and budgeting process which includes a procedure for the retrenchment and reallocation of funds. In Fiscal Year 1980, approximately \$3 million was cut on a formula basis from all units' budgets. This pool of funds was then reallocated to units on a judgmental basis. Commencing in Fiscal Year 1981, the planning and budgeting processes are in place, and both the budget cuts and the reallocation of funds will be made on a judgment basis.

Within the Community College System, funding and staffing are not allocated proportionately on the basis of enrollments. Institutions with small enrollments are allocated more funds and staff per student than are the institutions with large enrollments. The effect of the allocation is to allow the smaller institutions to continue to offer a basic range of programs. The larger institutions, because they experience economies of scale (compared to small institutions) are able to offer a satisfactory range of programs with a higher student/faculty ratio.

In general, state funding of public post-secondary education in Minnesota has been, to a large extent, related to enrollments. Although no concrete formulas are used for the collegiate systems, state funding and staffing have tended to follow enrollments. An analysis was conducted to examine the relationship between the level of enrollments and aggregate expenditures in constant dollars in each of the public post-secondary education systems in Minnesota.¹⁶ The results indicated that for the fiscal years 1971-1977, enrollments were a very good predictor of aggregate expenditures in three of the four public systems. The relationship did not hold in the State University System because aggregate expenditures did not fluctuate with enrollments during this time period. A description of the analysis is included in Appendix A. Figure 1 displays the data and the statistically determined lines graphically. Many factors affect the level of state appropriations to the public systems. The relationship shown does not necessarily mean that enrollments were the only factor used in making the appropriations' decisions. On the

¹⁶The Higher Education Price Index was used to deflate current dollars to constant dollars. 1971 was used as the base year. The technique used, known as linear regression analysis, statistically determines the trend line which best fits a set of data points.

FIGURE 1
FYE ENROLLMENTS AND TOTAL EXPENDITURES IN
CONSTANT DOLLARS FOR FISCAL YEARS 1971-1977



whole, though, the results tend to support the contention that funding of public post-secondary education in Minnesota has been directly related to enrollments in the recent past, whether by design or not.

Implications of Minnesota's Funding Policies

The policies discussed above, which were implemented to cope with enrollment fluctuations and declines, are positive steps to remedy the situation as it existed when they were implemented. However, the long-term implications of these policies also must be assessed. The enrollment bulge policy and the student growth or decline factor do not directly address the problems arising from long-term enrollment declines. Although the enrollment bulge policy will minimize staff and funding reductions when enrollment declines begin, it will cease to have an effect beyond the mid-1980s when enrollments decline below the 1977 base. The student growth or decline factor has the effect of reducing short-term fluctuations in funding but only postpones by a year or two the effects of long-term enrollment declines. Special appropriations could be used to ensure funding of high priority programs which may not be funded during enrollment declines. However, such a policy is not a comprehensive one for funding of all post-secondary education. The minimum core funding policy at Southwest can be seen as a long-term funding policy. However, as enrollments decline over the long term, it will become a progressively more costly policy. Although the University of Minnesota and Community College System internal reallocation policies are useful management tools, they operate at the margin. They can be used to reallocate only a comparatively small portion of an institution's entire budget. If enrollment declines of the magnitude projected

actually occur with no changes in current funding policies, it is doubtful that internal allocation procedures can make the reductions necessary and sustain quality and breadth of program offerings. In general, a more comprehensive policy for funding public post-secondary education in a period of long-term enrollment decline may be required in the 1980s and beyond.

The continuation of funding policy related directly to enrollments in a period of enrollment decline could have serious consequences for some public post-secondary institutions and for the overall health and vitality of post-secondary education in Minnesota.

Basic economic theory applied to post-secondary education states that there are fixed and variable costs incurred in the operation of an institution in the short run. Fixed costs are those incurred regardless of the volume of instruction or other activity. Certain expenses must be incurred if an institution is to operate regardless of the level of enrollment (i.e., admissions, counseling, a minimum of course offerings, etc.) Variable costs are those related more directly to enrollments or other activities (i.e., instruction beyond the minimum course offering). Funding of all expenditures on an average cost per student basis assumes that there are no fixed costs. In a period of significant enrollment decline, funding on an average cost basis could result in the minimum fixed costs not being funded adequately.

If system staffing is related to enrollments on a linear basis in the future, the total number of full-time equivalent (FTE) faculty in the four public systems would be reduced from 11,383 FYE positions in 1978 to 8,599 FYE positions in 1995, a reduction of 2,794 FYE positions or

24.5%.¹⁷ Detailed expenditure and staff reductions resulting from a staffing ratio based on funding policy are presented in Table 2. In a period of significant enrollment decline, staffing institutions on a linear basis could result in insufficient staff to provide a minimum of course offerings.

ALTERNATIVE FUNDING POLICIES

Several alternative funding policies have been identified. They are average cost funding, marginal cost funding, fixed and variable cost funding, minimum core funding and performance funding. The alternative funding policies will be examined in the context of how they affect the state's ability to achieve its goals for post-secondary education.

Average Cost Funding Policy

Average cost funding is defined as the funding of institutions or systems on a cost per student (or other unit of measurement) basis. The cost per unit is determined by dividing a measure of total cost, such as total expenditures, by a measure of activity such as student credit hours or full-time equivalent faculty. Institutions are then funded at this cost level or at some percentage of this level for the units of activity anticipated. The cost factor may differ for each institution in a state or may differ only by institution type (two-year, four-year, etc.) The cost factor is usually also differentiated by level of instruction within an institution.

¹⁷A computerized model was used to project staffing levels and various categories of expenditures for each public post-secondary system. Positions are projected based on Fiscal Year 1978 staffing ratios and enrollment projections. Expenditures are projected using Fiscal Year 1978 average compensation rates and non-personnel expenditures per full-year equivalent enrollment.

TABLE 2

PROJECTED CONSTANT DOLLAR EXPENDITURES AND UNCLASSIFIED STAFFING
 BASED ON CURRENT ENROLLMENT RELATED FUNDING AND STAFFING RELATIONSHIPS

<u>System</u>	<u>1978</u>		<u>1985</u>		<u>1995</u>	
	<u>Expenditures</u> ¹ (millions)	<u>Staff</u>	<u>Expenditures</u> (millions)	<u>Staff</u>	<u>Expenditures</u> (millions)	<u>Staff</u>
Area Vocational- Technical Institutes	\$107.9 (millions)	2,894	\$ 95.3 (millions)	2,557	\$ 81.1 (millions)	2,176
Community College System	45.1 (millions)	1,272	44.1 (millions)	1,249	34.3 (millions)	971
State University System	101.4 (millions)	2,269	101.4 (millions)	2,268	76.7 (millions)	1,716
University of Minnesota	253.0 (millions)	4,948	261.6 (millions)	5,063	192.5 (millions)	3,726
All Public Systems	\$507.4 (millions)	11,383	\$502.4 (millions)	11,137	\$384.6 (millions)	8,589

1 Total expenditures and positions taken from 1979-81 biennial budget request of each system. This includes all Federal expenditures and positions for the AVTIs, the Community College System and the State University System. Since only a small portion of the Federal funds are included for the University of Minnesota, expenditures and positions are not strictly comparable.

Some variation of average cost funding is the basis for most formula type budgeting in the United States.¹⁸ Minnesota is an example of average cost funding for the area vocational-technical institutes practiced in the formula or program budgeting types. This policy has provided sufficient funding for Minnesota's AVTIs in the past period of enrollment growth. However, in a period of enrollment decline, average cost funding could result in increased student/faculty ratios if lower paid faculty are laid off first. In small institutions, average cost funding could result in the minimum fixed costs for instruction and support programs not being funded adequately.

Thus, in a period of enrollment decline, average cost funding could adversely affect the accomplishment of the state's goals for post-secondary education and, in a broader sense, the public interest. As institutions contract and instructional programs are eliminated, student access may be impaired on a regional basis. If support programs such as retention are eliminated as institutions contract, student access, as measured by program completion, could be impaired. Student choice, as measured by availability of financial aid, would not be significantly impaired under average cost funding. Educational diversity could be impaired under average cost funding since institutions which are not adequately funded could reduce their range of program offerings. Likewise, educational quality could be impaired as student/faculty ratios rise or the range of course offerings are reduced. Higher student/faculty ratios across all programs could lead to mediocrity. Efficiency would not be impaired under average cost funding during enrollment declines since institutions are funded for the average cost per student.

¹⁸Gross, 1973, pp. 114-122.

Finally, the state's financing goal could be impaired since some institutions might not receive sufficient resources to meet responsibilities. The effects of all alternative funding policies on the accomplishment of the state's goals for post-secondary education are summarized in Table 3.

Marginal Cost Funding Policy

Ideally, marginal cost funding would consist of applying the economic theory of marginal costs to the financing of post-secondary education. The theory states that at certain levels of operation, the additional costs incurred or saved as the result of enrolling one additional student or one less student are less than the average costs. This theory applied to funding would result in less than average cost being provided for enrollment increases, and funding would be reduced by less than average costs for enrollment declines. In reality, true marginal cost funding is rarely practiced because marginal costs are difficult to derive empirically.

The Indiana Higher Education Commission has developed what might be termed a marginal funding policy. The Indiana General Assembly accepted the funding policy and it was used for the 1977-79 biennium. However, change may be required as several problems in the marginal funding policy developed. The first is the fact that the marginal cost factors were derived on an ad hoc basis and are not directly related to actual costs. If the marginal cost factors cannot be directly related to actual costs, current support for the policy in Indiana may dissolve. The long-term effects of the policy also pose problems. Inequitable changes in funding levels may result from application of the model developed in Indiana. Three percent enrollment declines in each of two

TABLE 3

IMPACT OF FUNDING POLICIES ON
ACCOMPLISHMENT OF STATE GOALS

<u>Alternative Funding Policies</u>	<u>Student Access</u>	<u>Choice</u>	<u>Educational Diversity</u>	<u>Educational Quality</u>	<u>Efficiency</u>	<u>Financing</u>
Average Cost Funding	Could be impaired	No effect	Could be impaired	Could be impaired	No effect	Could be impaired
Marginal Cost Funding	No effect	No effect	Could be facilitated	Could be facilitated	Could be impaired	Could be facilitated
Fixed and Variable Cost Funding	No effect	No effect	No effect	No effect	Could be impaired	No effect
Minimum Core Funding	No effect	No effect	Could be facilitated	Could be facilitated	Could be impaired	Could be facilitated
Performance Related Funding	The impact of a performance related funding policy would depend upon the other policies used by the state and the specific form of the performance related policy.					

consecutive years are treated differently from a 6% enrollment change in the next year. With such a policy, it is not possible to maintain funding equity among institutions. Marginal cost funding, with its emphasis on costing per unit, would most likely be practiced in a state which uses, at least to some extent, the formula budgeting style, as is the case in Indiana.

A marginal funding policy in a period of enrollment declines would result in increasing average costs. Such a policy probably would not significantly affect the accomplishment of the state's student access and choice goals. Accomplishment of the educational diversity, quality and financing goals would not be impaired and could be assisted by a marginal funding policy since funding per student would be increasing. However, accomplishment of the efficiency goal would be impaired since average costs would increase as enrollments declined.

Fixed and Variable Cost Funding Policy

A fixed and variable cost funding policy would consist of applying the previously discussed economic theory that there are fixed and variable costs incurred in the operation of an institution.¹⁹ Fixed costs are those unrelated to the volume of instruction while variable costs vary with the volume of activity. To implement this alternative, fixed and variable costs within an institution must be defined. The distinction between fixed and variable costs is often made at the program level. Indices that vary with program costs are identified. In an instructional program, for example, 10% of costs may be defined as fixed and 90% as variable with enrollments. As enrollments decline,

¹⁹ Depending upon assumptions about the form of the cost curve of the institution, variable costs may be either higher than, equal to or lower than marginal costs.

90% of the instructional budget would be reduced proportionately with enrollments and 10% would remain fixed. Since fixed and variable costs are comparatively easier to derive than are marginal costs, this funding policy has more potential for actual implementation than does the marginal cost policy.

A fixed and variable cost funding policy similar to the one described above has been developed in Wisconsin for use in funding the University of Wisconsin System. Fixed and variable costs are specified at the program level and at the system level, 64% of costs were determined to be variable and 36% fixed. Thus, 64% of the budget is adjusted as enrollments change. However, dissatisfaction with the current definitions of fixed and variable costs has surfaced. The University of Wisconsin System management seeks to expand the definition of fixed costs, especially in the instructional area. Fixed and variable cost funding could be practiced under a performance program of formula budgeting type. Wisconsin is an example of a state using a fixed and variable cost funding policy in conjunction with the formula and program budgeting types.

In periods of enrollment declines, a fixed and variable cost funding policy will result in increasing average costs. A fixed and variable cost funding policy probably would not significantly affect the accomplishment of the state's student access and choice goals. Accomplishment of the educational diversity, quality and financing goals would not be impaired since minimum fixed costs would always be funded. Since average costs under a fixed and variable funding policy would be increasing, accomplishment of the state's efficiency goal would be impaired.

Minimum Core Funding Policy

A minimum core funding policy is a variation of the fixed and variable cost funding policy. The core funding policy is based on the premise that an institution will reach an enrollment level below which its enrollments are not large enough to justify (on a student/staff ratio or funding basis) the number of staff necessary to provide a minimum breadth of instructional and support programs. At or below this enrollment level, the institution is defined as having only fixed costs. A minimum core funding policy would commit sufficient funds to provide core staffing and resources to maintain such an institution and its programs regardless of how low enrollment levels drop. Presumably, once an institution's enrollment level goes above the critical level, it is funded in the same manner that it was prior to declining below the critical level. The key problem is, of course, the determination of the critical enrollment level and institution size. This level would presumably depend upon several variables including institutional mission, physical plant size, etc. As discussed above, Southwest State University is funded on a minimum core basis. A minimum core funding policy would fit appropriately with the formula, performance or program budgeting types. It could also be used in conjunction with an average cost, a fixed and variable cost or a marginal cost funding policy.

A minimum core funding policy would result in increasing average costs as enrollments declined. The magnitude of the average cost increase would depend on the minimum core level and the extent of the enrollment decline. Such a policy probably would not significantly affect the accomplishment of the state's student access and choice goals. Accomplishment of the educational diversity, quality and financing goals would

not be impaired by a minimum core funding policy since funding per student would increase as enrollments declined. However, accomplishment of the efficiency goal would be impaired as average costs increased.

Performance Related Funding Policy

A performance funding policy would attempt to distribute funding to post-secondary education systems or institutions based on performance. As indicated in the discussion of the performance budgeting type, the basic premise is to provide direct incentives to post-secondary institutions for improved performance. Performance goals and objectives related to state goals for post-secondary education and institutional missions would be developed as would the criteria for assessment of goal and objective achievement. The criteria would attempt to measure actual performance in terms of output as opposed to currently used measures of inputs and processes (i.e., student/faculty ratios and student credit hours). The difficulty, of course, is in defining outputs and developing measures which accurately assess performance. Some would have most or all institutional activities funded on a performance basis. In reality, due to its developing nature, performance based policies have only been used to provide small portions of institutions' funding requirements.

The current formula used in Tennessee for funding post-secondary education uses two performance based features. A pool of funds is appropriated to be allocated to institutions in proportion to the amount of sponsored research grants obtained in the previous year. Second, the distribution of funds for developmental studies is based in part on results achieved with previous allocations. In addition, the Tennessee

Higher Education Commission recently completed a project which successfully tested the feasibility of allocating an additional portion of state funds to post-secondary institutions on a performance related basis. The premise was to complement and not replace the enrollment related funding policy currently used in Tennessee. As a result of the project, the commission adopted a performance related funding policy and recommended it to the governor of Tennessee.

As indicated above, Tennessee practices a performance related funding policy within a formula budgeting type. The Private College Contract Program in Minnesota can be seen as an example of a performance related funding policy although the definition and assessment of performance are not as rigorous as those used in Tennessee. In Minnesota, this performance related funding policy is practiced within a program or performance budgeting type.

A performance funding policy would only provide a small proportion of the state funds going to an institution since it would complement and not replace other funding policies. Consequently, the effects of a performance funding policy on the state's goals for post-secondary education in a period of enrollment decline would depend upon the other funding policies used by the state and the specific form of the performance funding policy.

Summary

These alternative funding policies are not exhaustive, nor do they provide detailed specifications for determining the amount of appropriations to post-secondary educational systems or institutions. Rather, these alternatives provide a broad policy framework within which specific allocation methods could be structured. Successful implementation of any

of the cost related funding policies would require agreement upon precise definitions and uniform reporting of costs for each system. The definitions would recognize the similarities and differences of each system.

The discussion above provides a general indication of the effects of these policies on the accomplishment of the state's goals for post-secondary education. The precise effects of each policy on the goals may vary depending on the specific version of the policy which is implemented. Finally, it is more likely that some mix of the above policies, rather than a single policy, will best achieve the state's goals for post-secondary education.

CONCLUSION

Although state decision-makers have implemented several funding policies to cope with the enrollment declines, the long-term implications of these policies seem to indicate that a comprehensive funding policy is needed for the 1980s. Average cost funding, marginal cost funding, fixed and variable cost funding, minimum core funding, and performance related funding are five alternative policies identified and discussed. Due to the varying effects of the policies and the diverse nature of post-secondary education in Minnesota, it is likely that some mix of these and/or policies discussed will best support achievement of the state's goals for post-secondary education.

APPENDIX A

Linear regression was used to determine the extent to which the level of enrollments could be used to predict the aggregate expenditures for each of the public post-secondary education systems in Minnesota. FYE and ADM enrollments were the independent variables and aggregate instructional expenditures (excluding state specials, debt service, etc.) for fiscal years 1971 through 1977 were the dependent variables. Two sets of analyses were done; one in current and one in constant dollars deflated using the Higher Education Price Index. Table 4 presents the results of the analyses. The coefficient of determination, or R^2 , indicates the proportion of the variance in the dependent variable, expenditures, which is explained by the independent variable, enrollments. R^2 has a possible range of from 0 to 1. For three of the public post-secondary systems, the value of R^2 is very high, indicating that enrollment is a good predictor of expenditures. The State University System is the anomaly, with low values of R^2 . This may be due, in part, to the decrease in enrollments experienced by the State University System during the time period studied.

TABLE 4

LINEAR REGRESSION
COEFFICIENT OF DETERMINATION

	<u>Current</u> <u>Dollars</u>	<u>Constant</u> <u>Dollars</u>
Area Vocational-Technical Institutes	.97	.96
Community College System	.93	.95
State University System	.003	.27
University of Minnesota	.95	.93

