STUDY OF POST-SECONDARY EDUCATION COSTS

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STUDY OF POST-SECONDARY EDUCATION COSTS

December 8, 1988

MINNESOTA
HIGHER EDUCATION
COORDINATING BOARD

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MEMORANDUM

TO: COMMITTEE OF THE WHOLE

FROM: KATHLEEN M. KIES, ACTING EXECUTIVE DIRECTOR

SUBJECT: STUDY OF PUBLIC POST-SECONDARY COSTS

DATE: DECEMBER 8, 1988

The Coordinating Board's 1987-90 Management Plan included a study of post-secondary costs in public institutions. It is one of several studies on aspects of state financing for post-secondary education. This study addresses trends in costs and tuition rates and cost containment. The Average Cost Funding Task Force is currently addressing the issue of adequate funding for the public systems.

BACKGROUND

Several factors suggested the need for a study of instructional costs in Minnesota's public post-secondary systems. Both nationally and in Minnesota tuition and fee rates increased faster than the rate of inflation between 1971 and 1987. U. S. public post-secondary institutions' costs of instruction increased at a rate that was higher than that of the Consumer Price Index (CPI) between 1977 and 1986. The public perceives the cost of attending a post-secondary institution to be much higher than it is. Finally, Minnesota's ability to finance substantial increases in spending for public post-secondary education is uncertain. Since the costs of instruction in private institutions do not relate directly to state financing issues, they were not addressed in the study.

STUDY OBJECTIVES

The study of public post-secondary costs has four objectives:

- To describe the influences on post-secondary costs and tuition rates.
- To document the recent trends in Minnesota public post-secondary institutions' costs and tuition rates and to compare the trends to those of other public institutions in the United States.
- To explore the reasons for the recent trends in tuition and cost.
- To identify strategies that currently do or potentially could contain growth in costs and tuition rates.

The attached staff paper, Study of Post-Secondary Education Costs, reviews the influences on costs and tuition rates, recent trends in costs and tuition rates, and strategies for containing growth in costs and tuition rates.

FINDINGS AND CONCLUSIONS

The analysis in the paper found that post-secondary costs in the Minnesota public systems have decreased in constant dollars, but that tuition rates and financial aid awards have risen substantially in constant dollars. Several reasons for the trends are discussed. The impacts of the trends on the quality and amount of instructional and support services were not assessed. The primary findings and conclusions include the following:

Cost Trends

- Constant dollar costs per student in the public systems decreased between 1978 and 1983. The decreases were due primarily to state funding policies, the state's fiscal crises, and double digit inflation.

- Constant dollar costs per student in the public systems returned to 1978 levels by 1986. The increases appear to have been the result of a change in state financing policies and stable or declining enrollments.

- Constant dollar costs per student in the public systems decreased in three systems after 1986. The decreases since 1986 apparently were caused by enrollment increases and the two year lag in the funding policy.

Tuition and Fee Trends

- Tuition rates in all four Minnesota public systems rose moderately in constant dollars between 1978 and 1983. The moderate increases were due to the state's fiscal crises.

- Tuition rates in all four systems rose substantially in constant dollars between 1983 and 1986. The substantial increases were the result of the new state tuition policy.

- Tuition rates in the public systems rose more slowly between 1986 and 1989 than during earlier periods and the increases varied by system and level of instruction. Variations in tuition rate changes between 1986 and 1989 were the result of enrollment increases, system tuition policies, and a change in state tuition policy for the Technical Institute System.

- Undergraduate financial aid rose much more rapidly in constant dollars than enrollments between 1980 and 1988. These increases reflected the redesign of the State Scholarship and Grant Program and the significant funding increase that were implemented in 1984 and 1985.

RECOMMENDATIONS

In light of the findings and review of strategies in the report and discussion with the Higher Education Advisory Council and other members of the post-secondary education community, I RECOMMEND THAT:

1. **Minnesota retain its current mix of strategies for containing growth in post-secondary costs and tuition rates.**

   Rationale: The study found that post-secondary institutions' costs of providing instruction have decreased. Although tuition rates have increased significantly since the 1983 adoption of state financing policies, the rate of increase has slowed since 1986, and state and federal funding for financial aid has increased significantly. The review of cost containment strategies identified four broad strategies that could be used to contain growth in post-secondary costs and tuition rates. They include central planning and coordination, regulatory strategies, market strategies, and incentive strategies. Minnesota has a program or mechanism in place that uses each of the strategies identified. The Coordinating Board's program review and budget review responsibilities are examples of the central planning and coordinating strategy. The Board, however, does not currently exercise its review authority in the state's biennial budget process. The fiscal limitations contained in the state's average cost funding policy, an example of the regulatory approach, are probably the state's most effective method of influencing costs and tuition rates. The state's financial aid and tuition policies are examples of the market strategy. The incentive strategy of containing costs is embodied in the provision allowing systems to retain funds that remain unexpended at the end of each fiscal year. In light of recent trends in costs and tuition rates, there does not appear to be a need for exercising the Board's budget review authority or other cost containment strategies at present.

   Impact: Since this recommendation reaffirms current practice, there are no impacts.

2. **The Coordinating Board continue to monitor trends in costs of instruction and tuition rates.**

   Rationale: The study does not suggest the need for additional cost containment strategies. System requests for increased spending and the conflicting pressure to restrain levels of state spending and tuition rates, however, do

suggest the need for monitoring of trends in costs and tuition rates. The study also illustrated the fluctuations that occur in costs and tuition rates. Consequently, the Coordinating Board should continue its current practice of reporting data on trends in post-secondary costs and tuition and required fee rates in its biennial report to the governor and legislature. Should the monitoring trends in costs and tuition rates suggest a need for further cost containment measures, the Board could consider implementation of budget review.

Impact: Since this recommendation reaffirms current practice, there are no impacts.

3. **The Coordinating Board consider an evaluation of the state's finance and governance policies for post-secondary education as it develops its next management plan.**

Rationale: Minnesota adopted a set of financing policies for post-secondary education in 1983. The policies included average cost funding, cost related tuition, the design for shared responsibility in financial aid, expanded system governance authority, and revised tuition reciprocity agreements. The policies were intended to promote four of the state's goals for post-secondary education. The four goals include:

- o Preservation and enhancement of the quality of instructional programs;
- o Efficient use of resources in the provision of instructional programs;
- o Equity in the provision of state support for the public post-secondary systems; and
- o Access to post-secondary education.

The interactions of the tuition and financial aid policies were assessed in two studies conducted in 1985. One study was prepared by University of Minnesota faculty and staff with the financial support of the Coordinating Board. The other study was part of the Coordinating Board's Report to the Governor and 1985 Legislature. The effectiveness of the set of finance and governance policies in promoting accomplishment of the state's goals, however, has not been evaluated. In addition, many concerns have been raised by members of the post-secondary education community in Minnesota regarding the impacts of the policies. Many changes have occurred in post-secondary education in the six years since adoption of the policies. Participation rates have changed as have the types of students enrolled. Increased support for economic development is expected of institutions, and there is an increased emphasis on the quality of instruction. All these factors suggest that an evaluation of the policies is appropriate.

Impact: An evaluation of the state's financing policies for post-secondary education could require a significant commitment of resources. The decision regarding whether to conduct an evaluation and the extent of that evaluation should be made in the context of the Board's Management Plan process. In this way, all potential projects can be considered and priorities established.

This report and the recommendations will be discussed at the December 15 Committee of the Whole meeting. No action on the recommendations is requested until the January Board meeting.

Attachment

EXECUTIVE SUMMARY

INTRODUCTION

Post-secondary institutions' costs of providing instruction have come under close scrutiny in recent years. Concern regarding rapid increases in tuition rates has become widespread. Increases in the cost of providing instruction are commonly viewed as one of the primary causes of tuition increases. This view has led to calls for measures that would contain post-secondary costs. The study of post-secondary education costs is designed to address this issue for the Minnesota public post-secondary systems. Since the costs of instruction in private institutions do not relate directly to state financing issues, they are not addressed in the study.

The study of public post-secondary costs has four objectives:

- To describe the influences on post-secondary costs and tuition rates.
- To document the recent trends in Minnesota public post-secondary institutions' costs and tuition rates and to compare the trends to those of other public institutions in the United States.
- To explore the reasons for the recent trends in tuition and cost.
- To identify strategies that currently do or potentially could contain growth in costs and tuition rates.

BACKGROUND

The terms cost and tuition are used to refer to two different concepts in this study. Cost is used to refer to institutional expenditures while tuition refers to the price students pay for instruction. The term cost of instruction is defined for this study as the expenditures incurred by a post-secondary institution

to provide instruction. The cost of instruction includes both a portion of operating and a portion of capital expenditures. The operating cost of instruction includes both the direct expenditures for instruction and the indirect expenditures attributable to instruction. The capital cost of instruction is the portion of debt service payments for capital expenditures that is related to the provision of instruction.

The costs of instruction are important in Minnesota's financing policies for the public post-secondary systems. The operating cost of instruction directly influences levels of tuition revenue and state appropriations to the systems. The capital cost of instruction for the public post-secondary education systems is financed primarily by the state, and, in some instances, by school districts that operate technical institutes.

TRENDS IN COSTS AND TUITION RATES

Two objectives of this study were to examine recent trends in post-secondary institutions' operating cost of instruction, tuition rates, and financial aid and to explain the reasons for the observed trends. The analysis found that post-secondary costs in the Minnesota public systems have decreased in constant dollars, but that tuition rates and financial aid awards have risen substantially in constant dollars. Several reasons for the trends were discussed. The impacts of the trends on the quality and amount of instructional and support services were not assessed. Specific findings and conclusions regarding cost and tuition trends included the following:

Cost Trends

- The prices of goods and services purchased by post-secondary institutions grew much faster than prices in the U. S. economy and slightly faster than the prices of consumer goods and services between 1978 and 1989.

- Minnesota per capita personal income grew more rapidly than the consumer and higher education prices between 1978 and 1989.

- Constant dollar costs per student in the public systems decreased between 1978 and 1983. The decreases were due primarily to state funding policies, the state's fiscal crises, and double digit inflation.

- Constant dollar costs per student in the public systems returned to 1978 levels by 1986. The increases appear to have been the result of a change in state financing policies and stable or declining enrollments.

- Constant dollar costs per student in the public systems decreased in three systems after 1986. The decreases since 1986 apparently were caused by enrollment increases and the two year lag in the funding policy.

- Minnesota public institutions generally had larger decreases in constant dollar expenditures per student than similar non-Minnesota institutions between 1978 and 1983. The larger decreases in Minnesota were probably due to the more severe effect of the recession on the state and a state funding policy that did not provide substantial additional state appropriations for enrollment growth.

- Expenditures for support programs including academic support, student services, institutional support, and physical plant operations, have constituted an increasing proportion of the operating cost of instruction in the State University System and Community College System.

- A national study found that post-secondary student services and institutional support costs rose more rapidly than educational and general costs. The provision of more and better services, the use of more sophisticated and specialized management and finance staff, and compliance with increased government requirements were reasons suggested to explain the increases.

- Debt service for the public systems constitutes a substantial proportion of the state's support for post-secondary education. Capital costs may increase more rapidly in the future as a result of deferred maintenance.

Tuition and Fee Trends

- Tuition increases in all four public systems between 1971 and 1989 exceeded increases in Minnesota per capita personal income.

- Tuition rates in all four Minnesota public systems rose moderately in constant dollars between 1978 and 1983. The moderate increases were due to the state's fiscal crises.

- Tuition rates in all four systems rose substantially in constant dollars between 1983 and 1986. The substantial increases were the result of the new state tuition policy.

- Tuition rates in the public systems rose more slowly between 1986 and 1989 than during earlier periods and the increases varied by system and level of instruction. Variations in tuition rate changes between 1986 and 1989 were the result of enrollment increases, system tuition policies, and a change in state tuition policy for the Technical Institute System.

- Required fee rates in the Minnesota public post-secondary systems remained stable or decreased in constant dollars between 1978 and 1989. The decreases suggested that expenditures for student activities have risen more slowly than consumer prices.

- Minnesota public institutions had much larger increases than similar non-Minnesota institutions in constant dollar tuition and fee rates between 1982 and 1985. The larger increases in Minnesota institutions reflected the more severe impact of the recession on Minnesota and Minnesota's substantial increase in reliance on tuition revenue relative to other states.

- Undergraduate financial aid rose much more rapidly in constant dollars than enrollments between 1980 and 1988. These increases reflected the redesign of the State Scholarship and Grant Program and the significant funding increase that were implemented in 1984 and 1985.

- Constant dollar total awards in state scholarship and grant programs, both in Minnesota and in the United States, decreased between 1979 and 1983. The decreases were likely the result of rapid inflation and the economic recession.

- Constant dollar total awards in state scholarship and grant programs, both in Minnesota and in the United States, increased between 1983 and 1988. The increases were apparently due to state financial aid policy changes and significant funding increases in some state programs.

STRATEGIES FOR CONTAINING COSTS AND TUITION RATES

The analysis in this study found that per student costs in three of the Minnesota public post-secondary systems are decreasing, and, while tuition rates grew rapidly from 1978 to 1986, increased state and federal financial aid helped offset those increases and the rate of increase in tuition has slowed since 1986. These trends do not suggest the need for additional state measures to contain growth in costs and tuition rates.

Several factors do, however, suggest the need for a review of strategies that are or could be used to contain growth in costs and tuition rates. Continued upward pressure on costs is reasonably certain. All four public systems are requesting increases in their base spending levels. Meanwhile, there is continued pressure to restrain increases in state spending and tuition. Efforts to raise taxes meet with resistance. System and student representatives argue against significant tuition rate increases. Minnesota's current level of support for public post-secondary education, relative to its available resources, ranks above the national average. The state's level of support on a per student basis, however, is equal to the national average and has decreased in the last ten years. These conflicting trends suggest that additional state revenue may not be sufficient to finance desired spending increases.

Cost containment may be one way to provide expanded and/or improved post-secondary education services if sufficient additional revenues are not available. Three broad strategies from the health care experience suggest approaches to post-secondary

education cost containment. They include coordination and planning, regulatory strategies, and market strategies. A fourth strategy is the use of incentives to encourage cost containment efforts.

Minnesota has a program or mechanism in place that uses each of the four strategies. The Coordinating Board's program review process currently serves as a planning and coordination strategy and its budget review process could serve a similar purpose. The fiscal limitations that are part of the state's financing policy for the public post-secondary systems, a regulatory strategy, is probably the most effective method available to influence costs and tuition rates. The state's financial aid and tuition policies contain aspects of the market strategy for influencing costs and tuition rates. Finally, the provision that allows systems to retain unexpended funds is an example of the incentive strategy.

CONTENTS

TABLES

CHAPTER I. INTRODUCTION

Post-secondary institutions' costs of providing instruction have come under close scrutiny in recent years. Concern regarding rapid increases in tuition rates has become widespread. This concern has directed attention toward the causes of the tuition increases. Increases in the cost of providing instruction are commonly viewed as one of the primary causes of tuition increases. This view has led to calls for measures that would contain post-secondary costs. The study of post-secondary education costs is designed to address this issue for the Minnesota public post-secondary systems. Since the costs of instruction in private institutions do not relate directly to state financing issues, they are not addressed in the study.

ISSUES

Several factors suggest the need for a study of instructional costs in Minnesota's public post-secondary systems. The factors include recent increases in tuition and fees and in the costs of instruction, the public's perception about the cost of attending a post-secondary institution, and Minnesota's current level of effort in financing public post-secondary education.

Trends in Tuition and Fees

Nationally, tuition and fee rates increased faster than the rate of inflation at U. S. public institutions between 1971 and 1987, according to Hauptman and Hartle (p. 5). The annual rate of increase in tuition and fees exceeded those of the Consumer Price

Index (CPI) and disposable income since 1981. In Minnesota public post-secondary institutions, tuition and fee rates also increased faster than the CPI, and in most instances, faster than per capita personal income between 1971 and 1987.

Trends in Instructional Costs

U. S. public post-secondary institutions' costs of instruction increased at a rate that was somewhat higher than the CPI, according to a recent national study by Snyder and Galambos (p. 7). The study found that public institutions had decreases in constant dollar spending per student in the early 1980s and increases after 1983. The study also found that expenditures for student services and institutional support rose as a percent of educational and general expenditures between 1970 and 1985, (p. 34). Recent trends in the cost of instruction for Minnesota public institutions have been similar in some respects to the national trends. Although the pattern of change is similar, the increases in most Minnesota systems have not exceeded the rate of inflation.

Bowen (p. 38) found that increases in the costs of instruction per student in all U. S. institutions of higher education rose faster than the CPI between fiscal years 1950 and 1970 and slower than the CPI between Fiscal Years 1930 and 1950 and between Fiscal Years 1970 and 1978. The average annual rate of decrease in constant dollars between 1930 and 1950 was .4 percent. Bowen attributed this decrease to an increase in the proportion of enrollments in public institutions. The average annual constant dollar increase between 1950 and 1970 was 3.2 percent. This

growth, according to Bowen, was a result of society's willingness to provide substantial increases in support for post-secondary education. The comparable change in costs per student between 1970 and 1978 was -.4 percent. Bowen attributed the decrease to a slowing in the growth of revenues.

Public Perception About the Cost of Attendance

The public perceives the cost of attending a post-secondary institution to be much higher than it is, and these perceptions may be affecting decisions to attend. The average estimate of tuition, fees, books, supplies, room, board, transportation costs, and personal expenses provided in response to a 1987 survey was $9,120 at public four-year colleges and universities (Evangelauf, 1987, pp. A1, A70). The College Board estimated that the actual average for the 1987-88 school year was $5,789 for state residents. The public's estimate of similar costs at two-year institutions was $4,500, $611 higher than the College Board estimate of $3,889 for students living with their parents. A Coordinating Board survey found that only 33 percent of parents could accurately estimate the cost of attending a post-secondary institution (MHECB 1988, p. 54) In response to a recent national survey of 13 to 21 year-olds, 48 percent said that "too expensive, can't afford it," was the reason that more young people did not go to college (CASE, p. 5). Twenty-eight percent of the high school graduates who did not go to college gave "didn't have enough money" as the reason for not attending.

Minnesota's Ability to Finance Increases in Spending

Minnesota's ability to finance substantial increases in spending for public post-secondary education is uncertain. The state's current level of support for public post-secondary education, relative to its available resources, ranks above the national average (Research Associates of Washington, 1988, p. 60). The state's level of support on a per student basis, however, is equal to the national average and has decreased in the last ten years. The state's high level of taxation and the perennial efforts to hold down taxes raise questions about the state's ability to provide substantial increases in support.

STUDY OBJECTIVES

The study of public post-secondary costs has four objectives. The first objective is to describe the influences on post-secondary costs and tuition rates. The second objective is to document the recent trends in Minnesota public post-secondary institutions' costs and tuition rates and to compare the trends to those of other public institutions in the United States. The third objective is to explore the reasons for the recent trends in tuition and cost. The fourth objective is to identify strategies that could contain costs and tuition rates.

CONTENTS OF THE PAPER

This paper includes four chapters and two appendices. Chapter II defines the concepts and reviews the literature regarding influences on post-secondary costs and tuition rates. Chapter III reviews recent trends in costs and tuition rates and

discusses reasons for the trends. Chapter IV identifies strategies that could influence costs and tuition rates. Appendix A contains a more detailed description of the influences on post-secondary costs and tuition rates. Appendix B describes the data sources and methods used to examine recent trends in costs and tuition rates.

FOOTNOTES

Bowen, Howard R., The Costs of Higher Education. San Francisco: Jossey-Bass, 1980.

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Evangelauf, Jean. "Many Americans Think College Costs Much More Than It Actually Does, A Chronicle Survey Finds," The Chronicle of Higher Education. September 2, 1987.

Research Associates of Washington, State Profiles : Financing Public Higher Education 1978 to 1988. Washington D. C., July 1988a.

Hauptman, Arthur and Terry Hartle, Tuition Increases since 1970: A Perspective, Higher Education And National Affairs. American Council of Education, February 23, 1987.

Minnesota Higher Education Coordinating Board, Report on Survey of Parents of Eighth Graders. St. Paul, August 8, 1988.

Snyder, Thomas P. and Eva C. Galambos, Higher Education Administrative Costs: Continuing the Study. Office of Education Improvement, United States Department of Education, Washington, D. C., January, 1988.

CHAPTER II. BACKGROUND

The term cost is used to refer to tuition, the cost of attending a post-secondary institution, and the institution's cost of providing instruction. These multiple uses of the term often create confusion. This chapter defines several concepts related to post-secondary expenditures and revenues. State financing policies for post-secondary education are described and literature regarding the influences on costs and tuition rates is reviewed.

DEFINITIONS

The terms cost and tuition are used to refer to two quite different concepts for this study. Cost is used to refer to institutional expenditures while tuition refers to the price students pay for instruction. These terms, as well as expenditures, revenues, and the cost of attendance are defined in this subsection. The definitions of expenditures and revenues are drawn from a publication entitled HEGIS Financial Reporting Guide: 1980 Edition (Allen, pp. 7-25).

Expenditures

Post-secondary institutions' expenditures can be classified into two primary categories, current operating expenditures and capital expenditures.

Current Operating Expenditures. Post-secondary institutions' current operating expenditures are defined as the total cost of the goods and services used in operating the institution during the current fiscal year. Operating expenditures include broad

subcategories of educational and general expenditures, auxiliary enterprise expenditures, hospital expenditures, and expenditures for independent operations. Educational and general expenditures are those that support the accomplishment of the institution's mission. They include direct expenditures for the primary function of instruction, research, and public service as well as indirect expenditures for functions that support the accomplishment of the three primary functions. The support functions include academic support, libraries, student services, institutional support, and physical plant operations. Auxiliary enterprise expenditures are for the operations of institutional entities that provide goods and services to students and employees. Examples of auxiliary enterprises include dormitories, food services, and book stores. Hospital expenditures are those associated with patient care at hospitals operated by the institution. Expenditures for independent operations are for those entities that are unrelated to the primary mission of the institution.

A subset of current operating expenditures is the category of state general fund expenditures. This category includes institutional expenditures that are supported by revenues included in the state budget. State general fund expenditures are those supported by state appropriations, tuition revenue, and several other minor revenue categories. The state budget excludes most expenditures supported by revenues from gifts, grants, contracts, endowments, and the sales and services of institutional activities.

Capital Expenditures. The textbook definition of a capital expenditure is one incurred to obtain an asset with a useful life

of more than one year. The term capital is used in this study to refer to expenditures for fixed assets such as land, buildings, and major equipment which are used for long periods of time. Such capital acquisitions typically are financed by the sale of bonds. As a consequence, a post-secondary institution's capital expenditures typically take the form of principal and interest payments on bonds, or debt service.

The Cost of Instruction

The term cost of instruction is defined for this study as the expenditures incurred by a post-secondary institution to provide instruction. The cost of instruction includes both a portion of operating and a portion of capital expenditures.

Operating Cost of Instruction. The operating cost of instruction is a subset of educational and general expenditures. The subset includes both the direct expenditures for instruction and the indirect expenditures attributable to instruction. Direct expenditures are those incurred in providing classroom instruction. They include categories such as faculty compensation, supplies and materials. Indirect expenditures for instruction include the component of expenditures for support functions that is related to the provision of instruction. The component related to the provision of instruction is typically determined through a cost study. Support service expenditures are attributed to instruction, research, and public service on the basis of measures and judgments about the demand for those support services by each of the three primary functions. Support expenditures not

considered part of the cost of instruction are allocated to research and public service.

Capital Cost of Instruction. The capital cost of instruction is the portion of debt service payments for capital expenditures that is related to the provision of instruction. A cost study would be required to determine the portion of debt service expenditures that is attributable to instruction.

Revenues

Public post-secondary institutions derive revenue from many sources. They include tuition and fees, government appropriations, and other sources.

Tuition and Fees. Tuition and fees include revenues from charges assessed students who attend an institution. Tuition revenues typically are used for educational purposes. Fee revenues typically are used to support student services or activities.

Government Appropriations. Government appropriations include revenues for current operations received from federal, state, or local units of government. The appropriations may be available for any operating purpose, or they may be restricted to use for certain purposes.

Other Sources. This category includes revenues from government grants and contracts, private gifts, private grants and contracts, endowment income, sales and services of educational activities, auxiliary enterprises, and hospitals.

The Cost of Attendance

The cost of attendance is defined as the expenses a student incurs to attend a post-secondary institution. It includes educa-

tional expenses and living expenses. Educational expenses are those for purposes such as tuition, fees, books, and supplies. Living expenses are those for housing, food, transportation, clothing, and personal items incurred while a student is pursuing a post-secondary education.

THE ROLE OF COSTS IN FINANCING PUBLIC POST-SECONDARY EDUCATION

The costs of instruction are important in Minnesota's financing policies for the public post-secondary systems. The operating cost of instruction directly influences levels of tuition revenue and state appropriations to the systems. The capital cost of instruction is financed almost exclusively by state appropriations.

The Operating Cost of Instruction

Minnesota uses an average cost funding formula to provide appropriations for the operating cost of instruction in the public post-secondary education systems. Levels of appropriations are determined on the basis of the costs of providing instruction and the volume of instruction provided. Cost is measured by the average operating cost of instruction per student, and volume is measured by full year equivalent or average daily membership enrollments. The average costs are calculated for each level of instruction -- lower division, upper division, graduate, and professional -- and each of three program cost categories -- low, medium, and high. The costs are multiplied by the corresponding enrollment two years prior to the year being funded. The products are added to obtain estimated instructional expenditures. Thus,

estimated instructional expenditures for Fiscal Year 1988 are based on Fiscal Year 1986 enrollments and Fiscal Year 1988 costs. The two year lag is intended to provide time for institutions to adjust their spending levels to enrollment changes. Appropriations for instruction are equal to 67 percent of estimated instructional expenditures for the University of Minnesota, the State University System, and the Community College System. Appropriations for instruction are equal to at least 67 percent of estimated instructional expenditures for the Technical Institute System.

The state tuition policy expects that 33 percent of estimated instructional expenditures will be funded by students through tuition revenue in the collegiate systems and at least 26 percent will be funded by students in the Technical Institute System. The expected tuition percentage applies only in the aggregate to each public post-secondary education system. Each system governing board has discretion in implementing the tuition policy. There is no expectation that each student must pay a specified percentage of the cost of instruction. Tuition rates may be uniform or they may vary on the basis of the level of instruction, the program cost, or other appropriate factors. Governing boards may raise either more or less than the expected amount of tuition revenue. Governing boards also set required fee rates.

The Capital Cost of Instruction

The capital cost of instruction for the public post-secondary education systems is financed primarily by the state and, in some instances, by school districts that operate technical institutes.

The state finances 100 percent of the capital cost of instruction on projects it approves for consolidated technical institutes such as Southwestern Technical Institute, the Community College System, the State University System, and the University of Minnesota. The state finances 85 percent of the capital cost of instruction on projects it approves for other technical institutes, and the school district operating the institute finances the remaining 15 percent. The University of Minnesota and the State University System have the authority to bond for construction and do so primarily for auxiliary enterprise facilities. Debt service on these bonds is typically paid from user fees.

INFLUENCES ON POST-SECONDARY COSTS

There are many influences that affect post-secondary institution's costs of instruction. Paul Brinkman of National Center for Higher Education Management Systems developed a conceptual framework that identifies three sources of influence on post-secondary costs (1988). The influences are those of the institution itself, the higher education community, and the external environment. He identifies cultural and material conditions within each level of influence that affect costs. Culture represents the predominant set of values, attitudes, and norms that influence the operation of the institution. Material conditions represent the physical state of affairs, the structures, and the relationships within which the institution operates.

Influences within post-secondary institutions have the most direct impact on costs, according to Brinkman. System influences

on institutions costs are treated as institutional influences. An institution's values, attitudes and norms are a significant influence on costs. Brinkman identifies the mission, the size and nature of student body, the physical plant, the revenues available, system and institutional financing policies, system governance structures, and institutional management practices as material conditions that influence costs. An institution's relative emphasis on instruction, research, and public service as well as its specialization within each of these areas affects its costs. An institution's costs of instruction are affected by the number and mix of disciplines offered and the number and level of degree and support programs offered. The size and nature of the student body is an important influence on costs. The size, age, location, and condition of an institution's physical plant affect its costs. Bowen (pp. 17-23) argues that in the short run, an institution's available revenues per student determine its costs. The cost per student is a function of available revenue and enrollment, according to this "revenue" theory of cost. System allocation policies and institutional budgeting practices influence post-secondary institutions' costs. System governance structures also influence costs.

Post-secondary institutions are members of a community of institutions and other post-secondary education organizations. Values, attitudes, and norms espoused within the post-secondary education community influence individual institution's costs. Brinkman contends that a primary cultural influence of the community is exerted through disciplines. Material conditions

such as the current knowledge base within disciplines, instructional technologies, relations among institutions, and post-secondary education organizations affect institutions' costs, according to Brinkman.

The environment external to post-secondary institutions and the post-secondary education community also exerts significant influence on post-secondary institutions' costs. Brinkman identifies two external cultural conditions that relate directly to post-secondary education. They are expectations for post-secondary education and the value of post-secondary education. In addition, Brinkman discusses several other conditions that affect many sectors of society including post-secondary education. Changes in society's expectations for post-secondary education influence costs. The value of post-secondary education to consumers, producers, and entities that finance it has significant impacts on costs. Fundamental changes in society such as the civil rights and women's movements influence post-secondary costs.

Many material conditions external to post-secondary education that exert influence on post-secondary costs were identified by Brinkman. Government's financing policies and regulatory practices are its primary influences on post-secondary costs. The political climate can have a substantial impact of costs. Economic factors including inflation, unemployment, the condition of the economy, and the demand for individuals with advanced training are influences on post-secondary costs. Post-secondary costs also are affected by demographic, technological, and social changes.

INFLUENCES ON POST-SECONDARY TUITION RATES

Several influences affect public post-secondary education tuition rates. External influences probably are the most significant influences on public post-secondary tuition rates. They include state tuition policies, levels of state appropriations, and external cultural conditions.

A review of the literature reveals four broad approaches used by states in setting tuition rates for their public post-secondary institutions (McKeown, p. 5 and Curry, p. 6). The first approach consists of adjusting tuition rates based on the change in a specified economic index. The index might be an index of prices such as the Consumer Price Index, the Higher Education Price Index, or a measure of changes in individual income. The second approach consists of establishing tuition rates or levels of tuition revenue in relationship to some measure of the cost of providing instruction. The third approach consists of establishing tuition rates on the basis of the rates at benchmark institutions. The fourth approach tends not to be as formally specified as the other three. This approach is characterized as one that sets tuition to generate all or most of the difference between what the institutions believe they need and what the state and/or local government appropriate.

The level of state appropriations appears to be a significant influence on tuition rates (Wittstruck and Bragg, p. 21). This relationship can be both negative and positive. In the short term, higher increases in state appropriations have been

associated with smaller increases in tuition. Tuition rates also increase with appropriations in the long term.

A state's collective values and attitudes regarding post-secondary education are a significant influence on tuition rates. The extent to which a state values access to post-secondary education, and the way it chooses to promote access affect tuition rates. The post-secondary community exerts influence on public post-secondary institutions' tuition rates through competition.

System and institutional influences include both material and cultural conditions. A system or institution's cost of instruction influences its tuition rates. The nature of that role depends in part upon the state tuition policy. The values, attitudes, and norms that a system or institution holds also influence its tuition rates.

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CHAPTER III. TRENDS IN COSTS AND TUITION RATES

The conventional wisdom is that costs and tuition rates have increased significantly in recent years. This chapter examines trends in several economic indices and trends in costs, tuition rates, and financial aid that were prepared with data from Minnesota's public post-secondary systems, Higher Education General Information Survey (HEGIS), Research Associates of Washington, Higher Education Coordinating Board, and The National Association of State Scholarship and Grant Programs. Reasons for the observed trends are discussed. The last section of the chapter presents conclusions. Appendix B describes of the data sources, limitations, definitions, and the methods of analysis used.

ECONOMIC INDICES

The prices of goods and services purchased by post-secondary institutions grew much faster than prices in the United States economy and slightly faster than the prices of consumer goods and services between 1978 and 1989. The cumulative Higher Education Price Index (HEPI) was 11.9 percentage points higher than the CPI and 26.6 points higher than the Gross National Product (GNP) Deflator for the 11-year period, as shown in Table 1. Growth in the HEPI exceeded that of the GNP Deflator by 1.3 percent per year and that of the Consumer Price Index (CPI) by .5 percent per year between 1979 and 1989. The growth rate of the CPI, however, exceeded that of the HEPI and the Deflator between 1979 and 1983.

Table 1
Average Percent Change and Cumulative Change
Higher Education Price Index, Consumer Price Index,
Gross National Product Implicit Deflator, and
Minnesota Per Capita Personal Income
Fiscal Years 1979-1989

Year	Higher Education Price Index	Consumer Price Index	Gross National Product Deflator	Minnesota Per Capita Personal Income
Average Change				
1971-1978	6.6%	6.8%	-	9.6%
1979-1983	8.9%	9.4%	8.0%	8.7%
1984-1989	4.9%	3.5%	3.3%	6.3%
1979-1989	6.7%	6.2%	5.4%	7.4%
Cumulative Change				
1971	63.9	63.4	-	52.7
1978	100.0	100.0	100.0	100.0
1983	153.4	156.8	146.8	152.0
1986	180.1	173.7	161.5	187.2
1989*	204.4	192.5	177.8	219.3

SOURCE: HEPI, Research Associates of Washington; CPI, Bureau of Labor Statistics, U.S. Department of Labor; GNP and Minnesota Per Capita Disposable Income, Minnesota Department of Finance.

* HEPI and CPI inflation rates in 1989 were assumed to be equal to the 1988 rates.
Growth rates of the GNP Deflator are those projected by the Department of Finance.

Since 1983, the HEPI has risen more rapidly than the Deflator and the CPI.

The fact that the HEPI has risen more rapidly than the CPI since 1982 has generated some controversy. Given the differences in the mix of goods and services that each is based on, however, there is no particular reason why they should increase at similar rates. The fact that the HEPI rose more slowly than the CPI prior to 1982 often is cited one reason why the HEPI has risen more rapidly since then. It is argued that expenditures for certain items did not keep pace with inflation. Recent increases in costs are attributed, in part, to attempts to recover the lost ground.

Minnesota per capita personal income grew more rapidly than the three price indices between 1978 and 1989. It grew at rates comparable to those of the price indices prior to 1983 and has grown much more rapidly than the indices since 1983. This trend reflects the strong, diverse nature of the state's economy.

POST-SECONDARY COSTS

Recent trends in post-secondary institutions' operating costs of instruction, support expenditures, and the capital cost of instruction are presented in this section. The Minnesota systems' data are used to examine trends between 1978 and 1989. The HEGIS data are used to compare trends for Minnesota institutions with those of similar institutions in other states. The HEGIS data, particularly the enrollment data, have several significant limitations. The limitations are described in Appendix B.

Operating Cost of Instruction

This subsection presents data on the operating cost of instruction. The systems' data on instructional expenditures per full-year equivalent (FYE) enrollment are used to examine Minnesota trends. HEGIS data on estimated instructional expenditures per full-time equivalent (FTE) enrollment are used to compare Minnesota trends to those of other U. S. public post-secondary institutions in each of the five institutional classifications. The classifications are those developed by the National Center for Higher Education Management Systems (NCHEMS). The classifications are described and the Minnesota institutions in each are listed in Appendix B.

Systems' Instructional Expenditure Data. Three of the four public systems have levels of spending per student in 1989 that are lower than 1978 levels in constant dollar terms. All four systems had decreases, some substantial, in constant dollar expenditures from 1978 to 1983, as shown in Table 2. Between 1983 and 1986, conversely, all systems had increases in per student expenditures. Except for the University of Minnesota, all systems had decreases between 1986 and 1989.

The constant dollar decreases in per student spending between 1978 and 1983 were primarily due to state funding policies, the state's fiscal crises, and double digit inflation. The state funding policy for the collegiate systems provided no state appropriations for enrollment increases between 1978 to 1981. Small additional state appropriations were provided for enrollment increases in 1982 and 1983. The state's fiscal crises in the

Table 2

Average Instructional Expenditures Per Full Year Equivalent Student**
In Current and Constant Dollars for Minnesota Public Systems
Fiscal Years 1978, 1983, 1986, and 1989

System and Fiscal Year	Current Dollars Per FYE	Constant Dollars*		Instructional Expenditures Current $
		Dollars Per FYE	Pct. Change From 1978	
University of Minnesota				
1978	$2,956	$2,956	-	171,126.3
1983	$4,120	$2,686	-9.1%	242,146.4
1986	$5,349	$2,970	0.5%	300,280.9
1989	$6,521	$3,190	7.9%	360,972.1
State University System				
1978	$2,149	$2,149	-	82,789.7
1983	$2,953	$1,925	-10.4%	124,314.4
1986	$3,859	$2,143	-0.3%	166,622.6
1989	$3,996	$1,955	-9.0%	202,850.3
Community College System				
1978	$1,790	$1,790	-	36,273.6
1983	$2,335	$1,522	-15.0%	57,496.6
1986	$3,150	$1,749	-2.3%	76,348.2
1989	$3,381	$1,654	-7.6%	102,088.0
Technical Institute System				
1978	$2,567	$2,567	-	90,978.8
1983	$3,745	$2,442	-4.9%	154,901.1
1986	$4,654	$2,584	0.7%	182,993.6
1989	$5,094	$2,492	-2.9%	206,544.2

SOURCE: Minnesota Department of Finance
* The Higher Education Price Index was used as a deflator with 1978 = 100.
The inflation rate for 1989 was assumed to be 4.4 percent.
** Expenditure and enrollment data for Fiscal Year 1989 are estimated.

early 1980s were precipitated by an economic recession and the resulting decreases of revenues below expected levels. In response to the crises, levels of state appropriations for all purposes, including public post-secondary education, were reduced several times. Although the systems' tuition rates increased significantly, they were not able to recover all the lost appropriations. Finally, prices throughout the economy escalated rapidly between 1979 and 1983. The HEPI rose 34 percent during this period and substantially exceeded inflationary adjustments in funding. Since all four systems had enrollment growth between 1978 and 1983, the lack of proportional increases in state funding together with reductions in state appropriations and the high rate of inflation meant decreases in average spending per student.

The increases in constant dollar spending per student between 1983 and 1986 appear to be due to a change in state financing policies in 1983 and stable or declining enrollments. The policy provides funding on the basis of the costs of instruction and enrollment two years earlier. A new tuition policy required students to pay a larger share of the costs of instruction. The net effect of the policies was higher levels of instructional revenues. The revenue increases together with stable or declining enrollments resulted in higher levels of constant dollar spending per student in 1986 than was the case in 1983.

Enrollment increases and the two year lag in the funding policy were apparently, in large part, the cause of decreases in spending per student in three of the systems between 1986 and 1989. The State University System and the Community College

System have had dramatic enrollment increases since 1986. The two year lag means that state appropriations for the additional students are delayed. Some state appropriations were provided in fiscal years 1988 and 1989 for enrollment increases not funded under the two year lag. In spite of the additional appropriations, enrollment increases depressed levels of revenue and consequently spending per student. Economies of scale also may mean that somewhat lower levels of expenditures were needed to provide instruction.

Enrollment decreases, the two year lag, and the University's Commitment to Focus program were likely the causes of increases in constant dollar spending per student at the University of Minnesota between 1986 and 1989. The University had enrollment decreases between 1986 and 1989. The two year lag means that state appropriations decrease two years after enrollments. Consequently revenues and spending per student, increase. The University also has received some additional state funding for its Commitment to Focus program.

HEGIS Instructional Expenditure Data. Both Minnesota and non-Minnesota institutions in all classifications had per student constant dollar decreases between 1978 and 1983 and increases between 1983 and 1986, as shown in Table 3. Minnesota public post-secondary institutions had larger decreases in average estimated constant dollar instructional expenditures per student than similar non-Minnesota institutions between 1978 and 1983 in three of five classifications examined. Minnesota institutions had percentage increases similar to non-Minnesota institutions

Table 3
Average Estimated Instructional Expenditures
Per Full-Time Equivalent Student
In Constant Dollars*
Minnesota Public Institutions and Other
Public Institutions in the United States
By Institutional Classification
Fiscal Years 1978, 1983, and 1986

Institutional Classification And Fiscal Year	Minnesota		Non-Minnesota	
	Dollars Per FTE	Pct. Change From 1978	Dollars Per FTE	Pct. Change From 1978
Research Universities				
1978	$7,178	-	$6,692	-
1983	$7,119	-0.8%	$6,588	-1.6%
1986	$7,718	7.5%	$7,174	7.2%
Comprehensive Institutions				
1978	$4,357	-	$5,068	-
1983	$3,791	-13.0%	$5,025	-0.9%
1986	$4,130	-5.2%	$5,420	6.9%
General Baccalaureate Institutions				
1978	$6,593	-	$4,836	-
1983	$4,743	-28.1%	$4,553	-5.9%
1986	$4,902	-25.6%	$4,743	-1.9%
Two-Year Academic-Comprehensive Institutions				
1978	$3,429	-	$3,695	-
1983	$3,144	-8.3%	$3,439	-6.9%
1986	$3,509	2.3%	$3,840	3.9%
Two-Year Occupational Institutions				
1978	$6,623	-	$4,130	-
1983	$6,363	-3.9%	$3,934	-4.7%
1986	$6,816	2.9%	$4,512	9.3%

SOURCE: IPEDS Financial Statistics and Fall Enrollment surveys
* The Higher Education Price Index was used as a deflator with 1986 = 100.

between 1983 and 1986. They did not, however, reach the same percentage of 1978 levels as non-Minnesota institutions because of the larger decreases between 1978 and 1983. The exception was the research university classification in which the Minnesota trend was virtually identical to that of similar non-Minnesota institutions.

The constant dollar decreases in instructional expenditures per student observed nationally between 1978 and 1983 appear to be, in large part, a consequence of rapid inflation and a recession. The prices of post-secondary goods and services increased more rapidly between 1980 and 1982 than during any other period since 1961. Appropriations and tuition revenue per student did not increase as rapidly as prices between 1978 and 1983, as shown in Table 4. As a consequence, expenditures decreased in constant dollars. The recession in the early 1980s affected many states, leading to severe fiscal problems for public post-secondary education. In response to a 1983 survey by the Education Commission of the States, 22 states reported that higher education budget reductions occurred in 1982, and 34 reported that they occurred in 1983 (ECS, p. 28). Actions taken to reduce expenditures included salary and staffing changes, enrollment limitations, termination of degree programs, delays in construction and maintenance, and reductions in support services (ECS, pp. 32-7).

The national constant dollar increases in expenditures per student between 1983 and 1986 likely were due to several factors: the lingering effects of inflation, an increased emphasis on

Table 4
Education Appropriations and Tuition Revenue
and Education Appropriations
Per Full Year Equivalent Student
In Constant Dollars*
Minnesota Public Institutions and
United States Public Institutions
Fiscal Years 1978, 1983, and 1986

	Minnesota		United States	
Fiscal Year	Dollars Per FTE	Pct. Change From 1978	Dollars Per FTE	Pct. Change From 1978
Education Appropriations and Tuition Revenue per FTE				
1978	$5,106	-	$4,586	-
1983	$4,367	-14.5%	$4,259	-7.1%
1986	$4,861	-4.8%	$4,841	5.6%
Education Appropriations per FYE				
1978	$4,232	-	$3,634	-
1983	$3,344	-21.0%	$3,275	-9.9%
1986	$3,677	-13.1%	$3,726	2.5%

SOURCE: Research Associates of Washington, "State Profiles, Financing Public Higher Education 1978-1988." Washington, D. C., July 1988.
* The Higher Education Price Index was used as a deflator with 1986 = 100.

post-secondary institutions' quality and their role in economic development, and the economic recovery.

The prices of some higher education goods and services have increased more rapidly than others in recent years. Compensation increases have exceeded non-personnel increases since 1982 (Research Associates of Washington, 1988b, pp. 12-3). During most of the 1970s and early 1980s, compensation increased more slowly than the CPI. Recent increases in expenditures can be attributed in part to institutions' efforts to regain the lost employee purchasing power. Collective bargaining and unionization of post-secondary employees also are likely to have resulted in higher costs than otherwise would have been the case. The prices of books and services also have increased more rapidly than other goods and services in 13 of the last 18 years (Research Associates of Washington, 1988b, pp. 12-3).

The quality of post-secondary education and role of post-secondary institutions in economic development have become the focus of public attention and public policy in recent years. Wittstruck and Bragg (p. 6) cited national and state efforts addressing these issues. Nationally, several reports have raised concerns about quality. In response to a 1985 survey, 16 of 20 states reported that endowed chairs or quality funding efforts were being developed or had been established (Mingle and Walker, pp. 1-11). The Commitment to Focus effort of the University of Minnesota and the Coordinating Board's quality assessment effort are Minnesota manifestations of the national trend toward quality improvement. The Mingle and Walker survey also found 15 states

reporting efforts to develop applied research centers or higher education-business linkages. Like other states, Minnesota has increased basic and applied research and technology transfer, established instructional programs that produce graduates for new and existing state industries, and developed training programs tailored to the needs of specific firms.

The economic recovery has meant that states and localities have had more revenues available to support higher costs, quality improvement, and economic development efforts in post-secondary education. The national average state and local appropriations per student increased substantially in constant dollars between 1983 and 1986, as shown in Table 4.

Although three categories of Minnesota institutions had larger decreases in spending per student than similar non-Minnesota institutions between 1978 and 1983, the Minnesota increases between 1983 and 1986 were comparable to those of non-Minnesota institutions. The larger decreases in Minnesota were probably due to the more severe effect of the recession on the state and a state funding policy that did not provide substantial additional state appropriations for enrollment growth. Minnesota's post-secondary education budget reductions were among the largest reported in the 1983 ECS survey (ECS, pp. 27-8). As indicated above, Minnesota's funding policy did not provide significant additional state support for enrollment increases. Although enrollment-related funding was not universal, it was the predominant method of financing in the early 1980s. Twenty-nine states reported using a state level enrollment-related funding

formula or guideline in response to a 1980 survey (McKeown, pp. 280-1).

Support Expenditures

This subsection presents data on support expenditures for instruction. The systems' data on instructional and support expenditures are used to examine Minnesota trends. A recent national study on trends in student services and institutional support expenditures in U. S. public post-secondary institutions is cited. This study used HEGIS data.

Systems' Data. The trends in support expenditures as a percent of the instructional expenditures vary among the public systems. Support expenditures include academic support, student services, institutional support and physical plant operations. The State University System and the Community College System had increases of 4.9 and 6.4 percent between 1978 and 1989, as shown in Table 5. The University of Minnesota remained stable, and the Technical Institute System had a decrease.

HEGIS Data. Snyder and Galambos (p. 34) found that a portion of post-secondary institutions' support expenditures, student services and institutional support costs, had risen more rapidly than educational and general expenditures. Student services and institutional support costs rose from 12.5 percent of educational and general expenditures in 1949-50 to 19.2 percent in 1984-85. The increase in the proportion of expenditures for student services and institutional support occurred primarily in the 1960s and early 1970s with modest increases in the 1980s.

Table 5
Support Expenditures* as a Percent of
Instructional Expenditures** and Change from 1978
Fiscal Years 1978, 1983, 1986, and 1989

System and Fiscal Year	Support as Pct. of Instructional Expenditures	Change From 1978
University of Minnesota		
1978	34.5%	-
1983	35.2%	0.7%
1986	32.5%	-2.0%
1989	35.3%	0.8%
State University System		
1978	37.9%	-
1983	41.2%	3.3%
1986	41.8%	3.9%
1989	42.8%	4.9%
Community College System		
1978	46.2%	-
1983	46.8%	0.5%
1986	52.8%	6.6%
1989	52.6%	6.4%
Technical Institute System		
1978	42.0%	-
1983	42.0%	0.0%
1986	35.0%	-7.0%
1989	35.0%	-7.0%

SOURCE: Minnesota Department of Finance

* Support expenditures are estimated for the TIS in all years and for the other systems in some years.
** Expenditure data for Fiscal Year 1989 are estimated.

Several reasons are advanced to explain the increases in support and administrative expenses. Post-secondary institutions are providing more and better services such as career guidance, counseling, job placement, and health services. Institutions are employing more sophisticated and specialized management and finance staff. Finally, compliance with increased government requirements such as environmental and employment regulations is resulting in increased administrative costs.

Capital Cost of Instruction

This subsection presents data on the capital cost of instruction. Minnesota state appropriations for post-secondary education debt service are used to illustrate the magnitude of capital costs. There are no comparable national data on capital expenditures available.

Debt service for the public systems constitutes a substantial proportion of the state's support for post-secondary education. Minnesota will spend more than $70 million in Fiscal Year 1989 for post-secondary debt service, as displayed in Table 6. In relationship to each system's operating appropriations, debt service ranges from 6.6 percent for the Technical Institute System to 10.8 percent for the Community College System. Additional debt service is paid by school districts that operate technical institutes.

Capital costs may increase more rapidly in the future. Many maintenance, repair, and renovation projects were postponed during the high inflationary years. In response to a recent survey, 60 percent of college planners reported that the need for new or modernized facilities on their campuses was "extremely urgent" or

Table 6
State Debt Service and Percent of
Operating Apropriations for the
Public Post Secondary Education Systems
Fiscal Year 1989

System	Debt Service Appropriation	Percent of Operating Appropriation
University of Minnesota	$37,521,000	9.3%
State University System	$11,797,000	8.0%
Community College System	$8,237,000	10.8%
Technical Institute System		
State Debt Service	$5,496,000	
State Debt Service Aid	$4,704,600	
Technical Institute Total	$10,200,600	6.6%
Total	$70,428,600	

SOURCE: Minnesota Department of Finance

"very urgent" (Evangelauf, pp. 1, 20). As a result of the delays, many institutions will need extensive capital improvements, as well as increased spending for maintenance. Ninty-nine percent of the planners responding to the above survey reported that their institutions would start major construction or renovation projects in the next five years.

TUITION AND REQUIRED FEE RATES

Recent trends in post-secondary institutions' tuition and required fee rates are presented in this section. The possible causes of the trends also are discussed. The Minnesota systems' data are used to examine trends between 1971 and 1989. The HEGIS data are used to compare trends for Minnesota institutions with those of similar institutions in other states.

Systems' Data

This subsection presents data on selected tuition rates and required fee rates in Minnesota public post-secondary institutions.

Tuition Rates. Tuition rates in all four public systems rose substantially in constant dollars between 1971 and 1989. The State University and Community College Systems had decreases, and the University of Minnesota had an increase in constant dollar tuition rates between 1971 and 1978, as shown in Table 7. Increases were moderate between 1978 and 1983 and substantial between 1983 and 1986 in all four public systems. Between 1986 and 1989 the State University and Community College Systems had slight changes in constant dollar tuition rates while the

Table 7
Full-Time Resident Undergraduate, Graduate, and Professional Tuition Rates
In Current and Constant Dollars for Minnesota Public Systems
Fiscal Years 1971, 1978, 1983, 1986, and 1989

System, Level, And Fiscal Year	Current Dollar Rate	Constant Dollars***		
		Rate	Pct. Change From 1971	Pct. Change From 1978
University of Minnesota				
Undergraduate—College of Liberal Arts				
1971	$399	$629	-	-
1978	$762	$762	21.1%	-
1983	$1,297	$827	31.4%	8.6%
1986	$1,669	$961	52.7%	26.1%
1989	$1,896	$985	56.5%	29.3%
Undergraduate—College of Forestry				
1971	$399	$629	-	-
1978	$825	$825	31.1%	-
1983	$1,407	$897	42.6%	8.8%
1986	$1,962	$1,130	79.5%	36.9%
1989	$2,381	$1,237	96.5%	49.9%
Graduate				
1971	$350	$552	-	-
1978	$855	$855	54.9%	-
1983	$1,590	$1,014	83.7%	18.6%
1986	$2,279	$1,312	137.7%	53.5%
1989	$2,673	$1,389	151.5%	62.4%
Professional—Medical School				
1971	$684	$1,079	-	-
1978	$1,866	$1,866	73.0%	-
1983	$2,580	$1,645	52.5%	-11.8%
1986	$4,114	$2,368	119.5%	26.9%
1989	$5,103	$2,651	145.7%	42.1%

Table 7 cont.

System, Level, And Fiscal Year	Current Dollar Rate	Constant Dollars***		
		Rate	Pct. Change From 1971	Pct. Change From 1978
State University System				
Undergraduate				
1971	$326	$514	-	-
1978	$461	$461	-10.3%	-
1983	$794	$506	-1.5%	9.8%
1986	$1,316	$758	47.3%	64.3%
1989	$1,440	$748	45.5%	62.3%
Graduate				
1971	$285	$450	-	-
1978	$390	$390	-13.2%	-
1983	$678	$432	-3.8%	10.9%
1986	$1,178	$678	50.9%	73.9%
1989	$1,289	$670	49.0%	71.7%
Community College System				
1971	$293	$462	-	-
1978	$439	$439	-5.0%	-
1983	$758	$483	4.6%	10.1%
1986	$1,080	$622	34.5%	41.6%
1989	$1,204	$625	35.3%	42.5%
Technical Institute System**				
1971	N/A	-	-	-
1978	N/A	-	-	-
1983	$438	$279	-	-
1986	$1,070	$616	-	120.5%
1989	$1,305	$678	-	142.7%

SOURCE: Minnesota Higher Education Coordinating Board
* Undergraduate tuition rates for academic years 1982-83 through 1988-89 are an average of lower and upper division rates.
** The Minnesota Technical Institutes did not charge tuition for Minnesota residents under the age of 21 prior to 1979.
*** Consumer Price Index-United States with Fiscal Year 1978=100.0. Inflation Rate for fiscal year 1989 were assumed to be 4.1 percent.

University of Minnesota and the Technical Institute System had moderate increases.

The tuition increases in all but one public system exceeded increases in Minnesota per capita personal income between 1971 and 1989. Per capita personal income rose 57.0 percent in constant dollars during that period. The tuition increase of 35.3 percent in the Community College System was slightly less than the increase in income. Undergraduate increases in other systems exceeded income by 8.5 to 59.5 percent. Graduate and professional increases exceeded income by 12.0 to 114.5 percent.

State University and Community College System tuition decreases between 1971 and 1978 appear to have been the result of constant dollar increases in the level of state appropriations per student (MHEC 1978, p. A16). The increases in state appropriations allowed spending levels to increase while tuition rates decreased in constant dollars.

Moderate constant dollar increases in tuition rates between 1978 and 1983 in all four public systems were likely due to the state's fiscal crises. The systems increased tuition at rates that were higher than inflation in response to several reductions in appropriations during the early 1980s. In Fiscal Year 1982, tuition rates in some systems were increased during the academic year in response to a mid-year appropriations reduction. The tuition increases allowed the systems to recover some of the lost revenue. Technical institute tuition rates were first established in 1979 for state residents under 21 years of age.

The new state tuition policy caused substantial constant dollar tuition increases between 1983 and 1986 in all four systems. The policy called for students in each system to finance a higher and more uniform percentage of the operating cost of instruction. The additional tuition revenue allowed higher system instructional spending levels.

The size of the increases between 1983 and 1986 varied among the systems and by level of instruction as a result of previous differences in the proportion of instructional costs financed by tuition and in system tuition policies. The State University System and the Technical Institute System had smaller percentages of instruction financed by tuition than the other systems in 1983. As a consequence, these systems had to raise their tuition rates more to reach expected levels of tuition revenue. The University of Minnesota adopted a system tuition policy that moves tuition rates for all collegiate units toward the system relationship of tuition to instructional cost. The consequence has been higher tuition increases in units with higher costs of instruction.

Differences in constant dollar tuition rate changes between 1986 and 1989 resulted from enrollment increases, system tuition policies, and a change in state tuition policy. The enrollment increases in the State University System and Community College System allowed those systems to adopt smaller increases in tuition rates and still generate the expected level of tuition revenue. Some undergraduate, graduate and professional rates at the University of Minnesota have increased more rapidly than others because of the system tuition policy discussed above. Tuition

rates in the Technical Institute System increased in constant dollars between 1986 and 1989 as a result of an increase in the percentage of instruction expected to be financed by tuition revenue.

Required Fees. Undergraduate required fee rates decreased in constant dollars between 1971 and 1989. The decreases ranged from 6.7 percent to 44.6 percent, as shown in Table 8. These fees generally finance expenditures for student activities or services that are not part of the operating cost of instruction. Examples of functions supported by required fees include student unions, student health services, student publications, and recreational sports. The decreases in required fees suggest that expenditures for student activities have risen more slowly than consumer prices.

HEGIS Data

This subsection presents data on trends in average undergraduate and graduate tuition and fee rates for Minnesota and other U. S. public post-secondary institutions in each of five classifications.

Average Tuition Rates. Public tuition and fee rates in Minnesota and similar non-Minnesota institutions decreased in constant dollars between 1978 and 1982, as shown in Table 9. The decreases in Minnesota institutions ranged from 2.8 to 11.1 percent. The non-Minnesota decreases ranged from 3.4 to 12.3 percent.

Although tuition and fee rates for all Minnesota and non-Minnesota classifications rose in constant dollars between 1982

Table 8
Full-Time Undergraduate Required Student Fees
In Current and Constant Dollars for Minnesota Public Systems**
Fiscal Years 1978, 1983, 1986, and 1989

System and Fiscal Year	Current Dollar Fees	Constant Dollars*		
		Fees	Pct. Change From 1971	Pct. Change From 1978
University of Minnesota				
1971	$123	$194	-	-
1978	$165	$165	-15.0%	-
1983	$224	$143	-26.4%	-13.4%
1986	$273	$157	-19.0%	-4.7%
1989	$312	$162	-16.5%	-1.8%
State University System***				
1971	$90	$142	-	-
1978	$135	$135	-4.9%	-
1983	$195	$124	-12.4%	-7.9%
1986	$227	$131	-7.9%	-3.2%
1989	$255	$132	-6.7%	-1.9%
Community College System				
1971	$60	$95	-	-
1978	$79	$79	-16.5%	-
1983	$74	$47	-50.1%	-40.3%
1986	$90	$52	-45.3%	-34.4%
1989	$101	$52	-44.6%	-33.6%

SOURCE: Minnesota Department of Finance
* The U.S. Consumer Price Index was used as a deflator with 1978 = 100. The inflation rate for 1989 was assumed to be 4.1 percent.
** The Technical Institute System has no required student fees.
*** Values are the maximum fee that could be charged.

Table 9
Average Full-Time Resident Undergraduate and Graduate Tuition and Required Fees In Constant Dollars*
Minnesota Public Institutions and Other Public Institutions in the United States
By Institutional Classification
Fiscal Years 1978, 1982, and 1985

Institutional Classification And Fiscal Year	Minnesota		Non-Minnesota	
	Tuition and Fees	Pct. Change From 1978	Tuition and Fees	Pct. Change From 1978
RESEARCH UNIVERSITIES-Undergraduate				
1978	$1,566	-	$1,243	-
1982	$1,420	-9.3%	$1,164	-6.4%
1985	$1,800	15.0%	$1,423	14.5%
RESEARCH UNIVERSITIES-Graduate				
1978	$1,723	-	$1,365	-
1982	$1,670	-3.1%	$1,300	-4.8%
1985	$2,412	40.0%	$1,636	19.9%
COMPREHENSIVE INSTITUTIONS-Undergraduate				
1978	$1,101	-	$1,005	-
1982	$979	-11.1%	$897	-10.8%
1985	$1,490	35.3%	$1,072	6.7%
COMPREHENSIVE INSTITUTIONS-Graduate				
1978	$1,169	-	$1,140	-
1982	$1,055	-9.7%	$1,000	-12.3%
1985	$1,503	28.6%	$1,207	5.9%
GENERAL BACCALAUREATE INSTITUTIONS-Undergraduate				
1978	$1,128	-	$1,039	-
1982	$1,029	-8.8%	$966	-7.0%
1985	$1,495	32.5%	$1,143	10.0%

Table 9 cont.

Institutional Classification and Fiscal Year	Minnesota		Non-Minnesota	
	Tuition and Fees	Pct. Change From 1978	Tuition and Fees	Pct. Change From 1978
TWO-YEAR ACADEMIC-COMPREHENSIVE INSTITUTIONS				
1978	$865	-	$556	-
1982	$776	-10.2%	$493	-11.2%
1985	$1,108	28.1%	$571	2.7%
TWO-YEAR OCCUPATIONAL INSTITUTIONS				
1978	$1,334	-	$672	-
1982	$1,297	-2.8%	$649	-3.4%
1985	$1,699	27.3%	$754	12.2%

SOURCE: IPEDS Institutional Characteristics Survey
*** The Consumer Price Index-United States was used as a deflator With 1985 = 100.**

and 1985, the Minnesota public institutions had much larger increases than similar non-Minnesota institutions. The non-Minnesota tuition rates, as a percent of the 1978 levels, ranged from 2.7 to 19.9 percent. Constant dollar percentage increases in average tuition and required fee rates in most Minnesota classifications were at least double those in similar non-Minnesota classifications.

The constant dollar decreases in tuition and required fee rates observed in both the Minnesota and non-Minnesota institutions between 1978 and 1982 were apparently due to rapid increases in the Consumer Price Index. Wittstruck and Bragg (p. 10) found that annual increases in the CPI exceeded increases in average tuition and fees by several percentage points in four-year public institutions between 1979 and 1981.

The constant dollar increases in tuition and fee rates observed in both the Minnesota and non-Minnesota institutions between 1982 and 1985 were apparently the result of the recession and an increased reliance on tuition revenue for financing public institutions. The revenue approach to state tuition policy suggests that tuition rates are increased when state appropriation increases are insufficient to finance desired spending levels. Thirty-eight percent of the states reported tuition increases in response to budget reductions that occurred during Fiscal Year 1983 (ECS, p. 34). More than half of the State Higher Education Executive Officers (SHEEOs) surveyed in 1988 responded that tuition increases in recent years have been necessary to compensate for decreases in state support (Mingle p. 23). Some evidence

suggests that the increased reliance on tuition revenue for financing public institutions is a long term trend rather than simply a response to the recession. Seventy percent of the SHEEOs responding to the Mingle survey reported a significant change in their state's tuition policy in the last 10 years (p. 9). More than 50 percent said that recent tuition and fee increases have been part of a conscious strategy to increase the share of costs paid by students (p. 23). An analysis prepared by Research Associates of Washington suggests that states have increased their reliance on tuition revenue for financing instructional costs between 1978 and 1988 (1988a, p. 102). The national average figure for tuition as a percent of instructional revenue increased from 20.7 to 23.6 percent. Although some of the increase occurred during the recession, there was a decrease in reliance on tuition in 1985 and an increase between 1985 and 1988.

The much larger constant dollar increases in tuition and fee rates in Minnesota public institutions reflect the more severe impact of the recession and a substantial increase in reliance on tuition revenue relative to other states. The relatively more severe impact of the recession was discussed earlier. The increase in reliance on tuition revenue is documented by the Research Associates of Washington tuition measure. Minnesota increased its reliance on tuition revenue from 20.1 percent of instructional revenue in 1982 to 24.9 percent in 1985.

FINANCIAL AID

Recent trends in undergraduate need-based financial aid are presented in this section. Coordinating Board data were used to examine trends between Fiscal Years 1979 and 1988. Data collected by the National Association of State Scholarship and Grant Programs (NASSGP) were used to compare trends in the Minnesota State Scholarship and Grant Program with trends in all state programs.

Coordinating Board Data

The constant dollar increase in aggregate undergraduate financial aid awards greatly exceeded enrollment increases between Fiscal Years 1979 and 1988. The increases in awards ranged from 42.2 to 205.6 percent while changes in undergraduate fall headcount enrollments ranged from -3.4 to 117.3 percent, as shown in Table 10. The financial aid increases reflect the redesign of the State Scholarship and Grant Program and the significant funding increases that were implemented in 1984 and 1985 to offset tuition increases. As a consequence of these changes, the initial tuition increases were offset for most full-time undergraduate students from lower and lower middle income families (MHECB, 1985, pp. 81-8). The net effect of the change in tuition and financial aid policies was to expect students from middle and upper income families to pay a larger share of the operating cost of instruction.

National Association of State Scholarship and Grant Programs Data

Constant dollar total awards in state scholarship and grant programs, both in Minnesota and in the United States, decreased between 1979 and 1983 and increased between 1983 and 1988.

Table 10
Combined State Scholarship and Grant and Pell Awards
Fall Undergraduate Headcount Enrollments and Percent Change
In Constant Dollars for Minnesota Public Systems
Fiscal Years 1979, 1983, 1986, and 1988

System and Fiscal Year	Constant Dollar Awards*	Percent Change From 1979	Undergraduate Headcount	
			Number	Pct. Change From Fall 1978
University of Minnesota**				
1979	$12,903,883	-	44,513	-
1983	$12,259,906	-5.0%	47,354	6.4%
1986	$16,757,749	29.9%	44,652	0.3%
1988	$18,372,958	42.4%	42,992	-3.4%
State University System**				
1979	$12,581,127	-	34,687	-
1983	$11,977,681	-4.8%	40,454	16.6%
1986	$21,077,504	67.5%	42,071	21.3%
1988	$22,936,753	82.3%	48,307	39.3%
Community College System***				
1979	$4,954,839	-	21,042	-
1983	$4,632,954	-6.5%	28,033	33.2%
1986	$12,184,847	145.9%	39,058	85.6%
1988	$14,914,980	201.0%	45,725	117.3%
Technical Institute System**				
1979	$8,687,215	-	27,291	-
1983	$8,215,447	-5.4%	31,786	16.5%
1986	$24,613,339	183.3%	40,166	47.2%
1988	$26,546,484	205.6%	33,613	23.2%

SOURCE: Minnesota Higher Education Coordinating Board
* The Consumer Price Index was used as a deflator with 1988 = 100. Awards for fiscal year 1988 are estimated.
** Excludes extension enrollments.
*** Excludes extension enrollments for fall 1978.

Between 1979 and 1983, total awards in Minnesota decreased by 8.0 percent while total U. S. awards decreased by 15.2 percent, as shown in Table 11. Minnesota total awards increased significantly between 1983 and 1988, reaching 60.0 percent of the 1979 level. Total U. S. awards rose substantially from the low point in 1983, reaching 6.4 percent above 1979 levels by 1988.

The number of awards in state scholarship and grant programs, rose dramatically in Minnesota and modestly in the United States between 1979 and 1988. Minnesota awards rose by 117.4 percent while U. S. awards rose by 7.9 percent.

The trends observed in state scholarship and grant programs between 1979 and 1988 were likely the result of rapid inflation, the economic recession, state financial aid policy changes, and significant funding increases in some state programs. The constant dollar decreases in total awards between 1979 and 1983 were probably due to the effects of the recession on state spending and the rapid inflation that occurred between 1979 and 1982. The significant increases in number of awards and total awards in Minnesota resulted from the redesign of the state program and the increases in funding discussed above. The growth observed in United States total awards between 1983 and 1989 appears to be, in part, the result of significant growth in several of the largest state programs. Nine of the 13 largest state programs grew by 84 percent between 1983 and 1988 (Reeher and Davis, p. 134).

Table 11
Total Awards and Number of Awards for Undergraduate
State Scholarship and Grant Programs Based on Need
In Constant Dollars for Minnesota and the United States
Fiscal Years 1979, 1983, 1986, and 1988

Fiscal Year	Minnesota		United States	
	Constant Dollar Awards*	Percent Change From 1979	Constant Dollar Awards*	Percent Change From 1979
1979	$37,489,002	-	$1,335,394,247	-
1983	$34,494,687	-8.0%	$1,132,842,975	-15.2%
1986	$48,440,895	29.2%	$1,314,609,159	-1.6%
1988**	$60,000,000	60.0%	$1,421,085,000	6.4%

Fiscal year	Number Of Awards	Percent Change From 1979	Number Of Awards	Percent Change From 1979
1979	30,356	-	1,217,750	-
1983	45,283	49.2%	1,249,800	2.6%
1986	55,858	84.0%	1,302,911	7.0%
1988**	66,000	117.4%	1,314,507	7.9%

SOURCE: National Association of State Scholarship and Grant Programs, 11th, 15th, 18th, and 19th Annual Surveys, Academic Years 1979-1980, 1983-1984, 1986-1987 and 1987-1988.
* The Consumer Price Index was used as a deflator with 1988=100.
** The 1988 data are estimated.

FINDINGS AND CONCLUSIONS

Two objectives of this study were to examine recent trends in post-secondary institutions' operating cost of instruction, tuition rates, and financial aid and to explain the reasons for the observed trends. The analysis found that post-secondary costs in Minnesota public systems have decreased in constant dollars, and that tuition rates and financial aid awards increased substantially in constant dollars. Several reasons for the trends were discussed. The impacts of the trends on the quality and amount of instructional and support services were not assessed. Specific findings and conclusions regarding cost and tuition trends included the following:

Cost Trends

- The prices of goods and services purchased by post-secondary institutions grew much faster than prices in the U. S. economy and slightly faster than the prices of consumer goods and services between 1978 and 1989.

- Minnesota per capita personal income grew more rapidly than the consumer and higher education prices between 1978 and 1989.

- Constant dollar costs per student in the Minnesota public systems decreased between 1978 and 1983. The decreases were due primarily to state funding policies, the state's fiscal crises, and double digit inflation.

- Constant dollar costs per student in the public systems returned to 1978 levels by 1986. The increases were apparently the result of a change in state financing policies and stable or declining enrollments.

- Constant dollar costs per student in the public systems decreased in three systems after 1986. The decreases since 1986 apparently were caused by enrollment increases and the two year lag in the funding policy.

- Minnesota public institutions generally had larger decreases in constant dollar expenditures per student than similar non-Minnesota institutions between 1978 and 1983. The larger

decreases in Minnesota were probably due to the more severe effect of the recession on the state and a state funding policy that did not provide substantial additional state appropriations for enrollment growth.

- Expenditures for support programs including academic support, student services, institutional support, and physical plant operations, have constituted an increasing proportion of the operating cost of instruction in the State University System and Community College System.

- A national study found that post-secondary student services and institutional support costs rose more rapidly than educational and general costs. The provision of more and better services, the use of more sophisticated and specialized management and finance staff, and compliance with increased government requirements were reasons suggested to explain the increases.

- Debt service for the public systems constitutes a substantial proportion of the state's support for post-secondary education. Capital costs may increase more rapidly in the future as a result of deferred maintenance.

Tuition and Fee Trends

- Tuition increases in all four public systems between 1971 and 1989 exceeded increases in Minnesota per capita personal income.

- Tuition rates in all four Minnesota public systems rose moderately in constant dollars between 1978 and 1983. The moderate increases were due to the state's fiscal crises.

- Tuition rates in all four systems rose substantially in constant dollars between 1983 and 1986. The substantial increases were the result of the new state tuition policy.

- Tuition rates in the public systems rose more slowly between 1986 and 1989 than during earlier periods and the increases varied by system and level of instruction. Variations in tuition rate changes between 1986 and 1989 were the result of enrollment increases, system tuition policies and a change in state tuition policy for the Technical Institute System.

- Required fee rates in the Minnesota public post-secondary systems remained stable or decreased in constant dollars between 1978 and 1989. The decreases suggested that expenditures for student activities rose more slowly than consumer prices.

- Minnesota public institutions had much larger increases than similar non-Minnesota institutions in constant dollar tuition and fee rates between 1982 and 1985. The larger increases

in Minnesota institutions reflected the more severe impact of the recession on Minnesota and Minnesota's substantial increase in reliance on tuition revenue relative to other states.

- Undergraduate financial aid rose much more rapidly in constant dollars than enrollments between 1980 and 1988. These increases reflected the redesign of the State Scholarship and Grant Program and the significant funding increase that were implemented in 1984 and 1985 to offset tuition increases.

- Constant dollar total awards in state scholarship and grant programs, both in Minnesota and in the United States, decreased between 1979 and 1983. The decreases were likely the result of rapid inflation and the economic recession.

- Constant dollar total awards in state scholarship and grant programs, both in Minnesota and in the United States, increased between 1983 and 1988. The increases were apparently due to state financial aid policy changes and significant funding increases in some state programs.

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CHAPTER IV. STRATEGIES FOR CONTAINING COSTS AND TUITION RATES

The analysis in this study suggested two broad conclusions. First, per student costs in three of the Minnesota public post-secondary systems have decreased. Second, although tuition rates grew rapidly from 1978 to 1986, increased state and federal financial aid helped offset those increases, and the rate of increase in tuition has slowed since 1986. These trends do not suggest the need for additional state measures to contain growth in costs and tuition rates.

Several factors do, however, suggest the need for a review of strategies that are or could be used to contain growth in costs and tuition rates. Continued upward pressure on costs is reasonably certain. All four public systems are requesting increases, some substantial in their base spending levels. They cite reasons such as the need to regain lost spending power in faculty salaries, the need to provide more and better instructional and support services to a more diverse student body, and the need to upgrade instructional equipment. Meanwhile, there is continued pressure to restrain increases in state spending and tuition. Efforts to raise taxes meet with resistance. System and student representatives argue against significant tuition rate increases. The state's current level of support for public post-secondary education, relative to its available resources, ranks above the national average (Research Associates of Washington, 1988b, p. 60). The state's level of support on a per student basis, however, is equal to the national average and has decreased in the last ten years.

The state's high level of taxation and the perennial efforts to hold down taxes raise questions about the state's ability to provide substantial increases in support. These conflicting trends suggest that additional revenues may not be sufficient to finance desired spending increases.

This chapter identifies several strategies that the state and in some instances, the systems and institutions currently do use or could use to contain growth in post-secondary costs and tuition rates.

COST CONTAINMENT DEFINED

Cost containment may be one way to provide expanded and/or improved post-secondary education services if sufficient additional revenues are not available. Cost containment is defined in this paper as the operation of an activity with a lower level of expenditures than was previously the case, without altering the volume or quality of the activity. The lower expenditures are the result of changes in the way the activity is conducted. The lower level of expenditures resulting from a cost containment activity may mean that the institution, system, or state spends less in total than it otherwise would have spent. Alternatively, the revenues made available by lower spending for one purpose may be used for other post-secondary education purposes within the institution, the system, or the state. The restraining influence of cost containment on expenditures also would be reflected in tuition rates.

STRATEGIES FOR CONTAINING COSTS AND TUITION RATES

The health care sector of the economy has made extensive efforts to contain costs. Morgan argues that the health care cost containment experience provides insights that are useful for post secondary education (p. 279). He cites similarities between post-secondary institutions and hospitals in organization, goals, and incentives. Morgan identifies three broad strategies used in health care cost containment that may suggest approaches to post-secondary education cost containment. They include coordination and planning, regulatory strategies, and market strategies. A fourth strategy is the use of incentives to encourage cost containment efforts (Ohio Board of Regents, p. 9). The strategies can be pursued through several programs or efforts, some with the specific objective of influencing costs and others with broader objectives. Although the strategies are discussed in terms of state level application, many also could be pursued at system or institutional levels. The strategies are described and examples of how they are or might be pursued are discussed in this subsection.

Central Planning and Coordination

This strategy uses central planning and coordination to influence post-secondary costs and ultimately tuition rates. The objective is to alter patterns of resource use and the nature, extent, number, and distribution of post-secondary instructional and support programs. Planning, program review, and budget review are examples of efforts that could be used to pursue this strategy.

Planning. Central planning in the health care sector consisted of developing statewide policies and priorities, which served as a guideline for preparation and review of regional plans. The regional plans in turn were used in reviewing proposed capital expenditures. The objectives of the planning process were to avoid duplication of facilities and consequently promote cost containment (Morgan, pp. 244-5). A similar state level planning process could be added to the capital budgeting process for the public post-secondary systems. Existing system level reviews of capital budget requests could be coordinated with the state plan. To the extent that the process reduced duplication and improved resource use, capital costs, operating costs, and ultimately tuition rates could be contained. According to Morgan, however, planning has had limited success containing health care costs and consequently is losing favor as a cost containment approach (p. 291).

Program Review. State level post-secondary program review typically consists of a process that examines proposed or current academic instructional programs. The process usually is organized under a state coordinating board. The Coordinating Board's program review function examines, and approves or disapproves proposed and existing instructional programs. The process determines if the programs duplicate others and if they are consistent with the system or institution's capabilities and mission. System governing boards review and must give tentative approval to proposed programs prior to their submission to the Coordinating Board's process. Advocates of program review contend that the

process helps to reduce program duplication and therefore contain post-secondary costs. Its effectiveness may not come as much through program decisions as through the effect that the existence of the process has on system and institutional planning.

Budget Review. State level post-secondary budget review typically consists of a formal role for the state coordinating board in the state budget process. The role may be advisory or it may be the development of the executive budget recommendations for post-secondary education. In many ways, the state level budget review role is analogous to the system board's role. The primary objective of a budget review function is to influence gubernatorial and legislative funding decisions and ultimately the levels and distribution of system funding. One outcome of this influence could be more effective resource use and cost containment. Although the Coordinating Board has budget review authority, it has not exercised this authority in the context of the state's biennial budget process. The effectiveness of budget review in constraining post-secondary costs is uncertain.

Regulatory Strategy

This strategy uses mandates and regulations to influence post-secondary costs and consequently tuition rates. Fiscal limitations, peer reviews, and mandated cost containment efforts are examples of regulatory strategies.

Fiscal Limitations. Fiscal limitations influence or mandate maximum levels of or maximum changes in post-secondary expenditures or funding. The limits may be applied in the aggregate or at some level of disaggregation. They are typically part of a

funding policy and serve to limit funding liability. Such limitations also could be used by the systems on institutional spending and by institutions on unit spending.

The amount of state appropriations for instruction provided by the legislature to the Minnesota public systems has substantial influence over the level of instructional spending and consequently tuition revenue and rates. The level of appropriations for instruction is determined by the average cost funding policy and decisions on other instructional spending requests. The level of state appropriations together with expected tuition revenue establishes an instructional spending level. That level is the maximum that will be recognized for funding in the following biennium. The policy takes that maximum as a starting point and allows certain expenditure changes. The changes are those that result from changes in the volume and mix of instruction by level and program cost category and changes in price. Additional changes in the level of expenditures must be justified separately. This limitation clearly serves to contain growth in public post-secondary costs that are funded by the state. The limitation's effects on total costs and tuition rates are less direct. Although additional instructional expenditures may be incurred, other sources of revenue must be secured to finance them. Tuition revenue may be raised in excess of expected levels, but there could be adverse political consequences if such increases became a routine practice.

Incremental appropriation reductions are another means of influencing levels of post-secondary spending. Minnesota used

this strategy during its fiscal crises in the early 1980s. Although the incremental reductions did contain or reduce expenditures, they also shifted more responsibility for funding expenditures to students.

Peer Reviews. This approach would call for reviews of resource allocation decisions by a group of peers. The objective is to contain costs and ultimately tuition rates by influencing resource use. Peer review was used extensively for cost containment in health care. Peers would review decisions about the type and extent of health care provided by hospitals. Morgan suggested the accreditation process and peer involvement in program review as prototypes for a peer based review of post-secondary programs and costs. Such reviews may risk conflict with system, institutional, and faculty prerogatives.

Mandated Cost Containment. This approach would require post-secondary systems or institutions to develop and implement efforts to contain their costs. The mandate might specify the dedication of resources to develop containment efforts. Alternatively, the mandate might specify amounts of savings to be generated. A third option would be to specify specific measures to be implemented. While this approach conceivably could contain costs, it is not consistent with generally accepted views of state and system roles in Minnesota post-secondary education. The state role is primarily funding and establishing policy. The system and institutional role is managing institutional operations.

Market Strategy

This strategy calls for the use of increased market forces on post-secondary institutions in order to influence their costs. The strategy seeks to increase competition among post-secondary institutions by increasing the number of students who are able to enroll, expanding their choices among institutions, and making them more sensitive to price. Examples include financial aid and cost related tuition.

Financial Aid. Need-based financial aid provides access to post-secondary education for more individuals and allows them greater choice among public and private institutions and programs. This expansion in the number of students and in their opportunities increases the competitive forces on institutions. The institutions have increased incentives to offer the best possible programs for the best prices. The federal Pell Grant Program and Minnesota's Scholarship and Grant Program are examples of the use of financial aid to increase market forces on institutions. The effectiveness of financial aid in constraining costs and tuition rates is uncertain. Some even argue that the result of financial aid is higher post-secondary costs and tuition rates, since increases can more easily be passed along.

Cost Related Tuition. This approach calls for students in public institutions to pay a larger share of the cost of providing instruction and for tuition rates to more accurately reflect differences in the cost of providing instruction. Paying a larger share of the costs makes students more sensitive to price. Relating price to cost helps students compare the relative benefits of

programs with their relative costs. This greater sensitivity to price and price differences presumably provides systems and institutions an incentive to restrain growth in costs and consequently tuition. Minnesota's tuition policy relates price to cost at the system level and expects students to pay a larger share of costs than they did previously. The University of Minnesota Board of Regents has implemented a similar policy for individual collegiate units. The effectiveness of this tuition policy in constraining growth in costs and tuition rates in the long run is uncertain. Some also might argue that the increased competition may lead to higher costs as a result of additional programs and services added by institutions in order to compete.

Incentive Strategy

This strategy calls for the provision of incentives, usually financial, to encourage systems and institutions to engage in cost containment efforts. The incentive may take the form of funds provided for the support of cost containment efforts in general or to support specific projects. Alternatively, systems and institutions might be allowed to retain savings generated through cost containment efforts. The latter provision is part of the state's financing policy for the public post-secondary systems. The systems retain funds left unexpended at the end of a biennium. Some systems have extended this provision to the institutional level. The effectiveness of this strategy in constraining growth in costs and tuition rates in the long run is uncertain.

CONCLUSIONS

Four broad strategies to contain post-secondary costs and tuition rates have been described. Minnesota has a program or mechanism in place that uses each strategy. The Coordinating Board's program review process serves as a planning and coordination strategy, and its budget review process could serve a similar purpose. The fiscal limitations that are part of the state's financing policy for the public post-secondary systems, a regulatory strategy, is probably the most effective method available to influence costs and tuition rates. The state's financial aid and tuition policies contain aspects of the market strategy for influencing costs and tuition rates. Finally, the provision that allows systems to retain unexpended funds is an example of the incentive strategy.

FOOTNOTES

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APPENDIX A. INFLUENCES ON POST-SECONDARY COSTS AND TUITION RATES

This appendix contains a detailed discussion of the influences on post-secondary costs and tuition rates that was summarized in Chapter II.

INFLUENCES ON POST-SECONDARY COSTS

There are many influences that affect post-secondary institutions' costs of instruction at many levels. This section contains a discussion of those influences. A paper by Paul Brinkman of the National Center for Higher Education Management Systems serves as the basis for the review. The paper was prepared for the State Higher Education Executive Officers.

Brinkman developed a conceptual framework that is useful in understanding the influences on costs. At the most basic level, post-secondary costs are a product of the mix, volume, and the price of inputs. Brinkman identifies three sources of influence on the mix, volume, and price of post-secondary inputs. The influences are those of the institution itself, the higher education community, and the external environment. He identifies cultural and material conditions within each level of influence that affect costs. Culture represents the predominant set of values, attitudes, and norms that influence the operation of the institution. Material conditions represent the physical state of affairs, the structures, and the relationships within which the institution operates. This subsection contains a description of Brinkman's framework, influences identified by Brinkman, and

examples from Minnesota public post-secondary education that illustrate influences on costs.

Institutional Influences

Influences within post-secondary institutions have the most direct impact on costs, according to Brinkman. System influences on institutions costs are treated as institutional influences.

Institutional Cultural Conditions. An institution's values, attitudes, and norms can influence its costs. Institutions that place a high value on equality of educational opportunity may have high recruitment and/or financial aid costs. An institution that aspires to achieve high national ranking in a particular program is likely to have higher than average costs in that program.

Institutional Material Conditions. Brinkman identified the mission, the size and nature of student body, the physical plant, the revenues available, system and institutional financing policies, system governance structures, and institutional management practices as material conditions that influence costs.

An institution's relative emphasis on instruction, research, and public service as well as its specialization within each of these areas affects its costs. Institutions engaging heavily in research, such as the University of Minnesota, tend to be more expensive while those focusing primarily on lower division academic instruction, such as some Minnesota community colleges, tend to be less expensive. The difference is due in part to the number and type of faculty employed. The research expectation is typically reflected in the type of faculty employed, in their instructional workloads, and in their salaries.

An institution's costs of instruction are affected by the number and mix of disciplines offered and the number and level of degree and support programs offered. Some disciplines are more expensive to offer because of factors such as equipment requirements or market conditions for faculty. Instruction at the graduate level tends to require smaller classes and consequently more faculty per student than does the undergraduate level. The type and number of support services offered also is a significant influence on cost. The size of library holdings, the extent of counseling and guidance services, and the number of administrative staff vary significantly and affect costs.

The size and nature of the student body influence costs according to Brinkman. Larger enrollments generally mean lower costs per student as a result of economies of scale. A more diverse student body has had cost impacts on the Minnesota public systems. Students who have not taken college preparatory instruction in high school usually need such instruction before taking college level courses. More support services usually are required for students from disadvantaged backgrounds and for older students who may never have attended a post-secondary institution or who are returning after a long absence. The additional support services typically mean higher costs.

The size, age, location, and condition of an institution's physical plant affect its costs. Larger and older plants tend to be more expensive to operate. Minnesota's climate, for example, means that institutions have higher heating and snow removal costs than many other institutions in the United States. As many insti-

tutions are now discovering, the level of maintenance or lack of it can dramatically affect operating and capital costs.

Bowen (pp. 17-23) argues that in the short run, an institution's available revenues per student determine its costs. The cost per student is a function of available revenue and enrollment according to this "revenue" theory of cost. Since institutions tend to maximize revenue from all sources, their costs are determined by their success in raising revenue, according to Bowen. Consequently, costs are determined by students, federal, state and local governments, private entities, and individuals who contribute to institutions. Public institutions' costs are determined primarily by state and local government decisionmakers. The factors identified by Brinkman that influence costs would act on the revenue providers, according to Bowen's theory. As a result of the widely dispersed influence on revenues, no single entity controls post-secondary costs.

System allocation policies and institutional budgeting practices influence a post-secondary institution's costs. The Community College System and the State University System allocation policies, for example, provide a minimum allocation to each institution, regardless of its enrollments. The Community College System allocation policy also provides fewer instructional staff for each additional increment of students. These features result in allocations per student and consequently costs per student in large institutions that are smaller than those in small institutions. Similarly, institutional budgeting practices

influence costs by determining the amount of revenue available to each campus unit.

System governance structures also influence costs. The Minnesota Technical Institute System provides an example of how a governance structure can influence costs. Although the system is governed by a state board, the institutes are operated by local school districts. The school districts typically negotiate a collective bargaining agreement that covers elementary, secondary, and technical institute faculty. Compensation increases tend to be related to increases in state aid for elementary and secondary education. State aid, however, has increased more rapidly than state appropriations for public post-secondary education. Consequently, technical institutes' faculty compensation is rising faster than their available revenues.

Post-Secondary Community Influences

Post-secondary institutions are members of a community of institutions and other post-secondary education organizations. The community influences institutions' costs.

Community Cultural Conditions. Values, attitudes, and norms espoused within the post-secondary education community influence individual institution's costs. Brinkman contends that a primary cultural influence of the community is exerted through disciplines. Faculty members trained in a particular discipline typically adopt the common values and attitudes of that discipline regarding what should be taught and how it should be taught. These common values and attitudes tend to exert influence on the organization and content of instruction in that discipline and

consequently its costs, wherever it is offered. The extent of influence depends upon other cultural influences within the institution and the type of institution. Doctoral research institutions are likely to have stronger discipline related influence than institutions offering lower division transfer instruction. Accrediting agencies, in fields where they exist, often exert influence similar to that of disciplines. A final post-secondary community influence identified by Brinkman is that of norms for working conditions. Teaching and research expectations, and consequently costs, are influenced by the post-secondary community.

Community Material Conditions. Material conditions such as the current knowledge base within disciplines, instructional technologies, relations among institutions, and post-secondary education organizations affect institution's costs, according to Brinkman. An increase in the knowledge base within a discipline may mean new courses and additional faculty. Changes in instructional technology could mean increases or decreases in costs, depending on the nature of the change and how it is implemented. The current state of relations among post-secondary institutions is best characterized by competition. Minnesota's financing policies for post-secondary education encourage competition through enrollment related funding, a cost related tuition policy, and a large need-based financial aid program. Competition provides incentives for institutions to expand programs and services and/or improve their caliber and consequently increase costs. Faculty unions are the prime example of the impact of post-secondary

organizations on institution's costs. Collective bargaining is the predominant means by which the terms and conditions of faculty employment are established in Minnesota public post-secondary education.

External Influences

The environment external to post-secondary institutions and the post-secondary education community also exerts significant influence on post-secondary institutions' costs.

External Cultural Conditions. Brinkman identifies two external cultural conditions that relate directly to post-secondary education. They are expectations for post-secondary education and the value of post-secondary education. In addition, Brinkman discusses several other conditions that affect many sectors of society, including post-secondary education.

Changes in society's expectations for post-secondary education influence costs. The expectation that a larger proportion of the population should benefit from post-secondary education is a prime example. The need to offer remedial and skills development instruction and expanded support services, such as assessment and guidance, tend to result in higher costs. Expectations that post-secondary institutions will support state economic development efforts also will tend to result in higher costs.

The value of post-secondary education to consumers, producers, and entities that finance it has a significant impact on costs. The value that individual consumers place on post-secondary education determines whether they participate and the extent of their participation. Higher participation might result

in higher post-secondary costs due to expansion of programs and services or lower costs due to economies of scale or the inability of revenue sources to support increased participation. The increase in participation relative to population in Minnesota public post-secondary education during the last decade appears to have contributed to a decrease is the level of state appropriations and tuition revenue per student (Research Associates of Washington, 1988b, pp. 80-2). The relatively high level of effort that Minnesota makes to support public post-secondary education presumably reflects the high value it places on this endeavor. Public post-secondary education costs in Minnesota are higher than they would otherwise be as a result of this effort.

Fundamental changes in society such as the civil rights and women's movements influence post-secondary costs. Here again, added services or administrative requirements may increase costs while added enrollments may reduce costs through economies of scale.

External Material Conditions. Many material conditions external to post-secondary education exert influence on post-secondary costs. The most significant of these, according to Brinkman, are government, politics, and changes in the economy, demography, and technology.

Government's financing policies and regulatory practices are its primary influences on post-secondary costs. Minnesota's average cost funding policy for the public post-secondary sector has several influences on institution's costs. The enrollment related feature of the policy provides an incentive for higher enrollments

and higher aggregate costs. The two year lag in funding lowers costs per student as enrollments are increasing and increases them as enrollments are decreasing. The recognition of level of instruction and program cost in the policy changes costs as the distribution of students changes. Federal and state financial aid programs affect institutional costs through administrative expenditures and by influencing enrollment decisions. Federal and state environmental protection and occupational safety laws are examples of government regulations that influence institutions' costs. The Coordinating Board's program review responsibility is another example of a state regulatory function that can affect post-secondary costs by influencing which programs are initiated.

The political climate can have a substantial impact on costs. The predispositions of the party in power to support post-secondary education are likely to affect both the revenues available and the distribution of those revenues among sectors and institutions.

Economic factors including inflation, unemployment, the condition of the economy and the demand for individuals with advanced training are influences on post-secondary costs. The period of high inflation from the mid 1970s to the early 1980s clearly affected post-secondary costs. Changes in the unemployment rate tend to have a direct impact on enrollments. The Technical Institute System and, to a lesser extent, the Community College System have tended to have enrollment decreases when the unemployment rate decreases and enrollment increases when it increases. These enrollment changes in turn affect costs through changes in economies of scale and in revenues. The recession of

the early 1980s and the resulting state fiscal crises provide a vivid example of the impact that the condition of the economy can have on costs. Several reductions in state appropriations to the Minnesota public post-secondary systems during a three year period significantly reduced their costs. Recently, increased demand for individuals with advanced tra ing in some primarily technical fields has necessitated higher levels of compensation in order to attract and retain faculty in these fields.

Post-secondary costs also are affected by demographic, technological, and social changes, according to Brinkman. The smaller number of individuals in the age group that post-secondary institutions traditionally have drawn from has meant enrollment decreases for some institutions. The decreases can affect costs through the loss of economies of scale. Other institutions have maintained or increased enrollments by serving individuals from other age groups with new programs that may mean higher costs. Technological changes must be incorporated into instructional and research programs in order to produce graduates with the most current knowledge of their field. Such changes generally mean higher costs. On the other hand, technological changes applied to support functions, like the automation of student records or library catalogues, may mean lower costs.

INFLUENCES ON POST-SECONDARY TUITION

There are many influences on public post-secondary education tuition rates at several levels. A framework analogous to Brinkman's is used to discuss the influences. This section contains a

discussion of the external, community, and system and/or institutional influences.

External Influences

External influences probably have the most significant impact on public post-secondary tuition rates. They include state tuition policies, levels of state appropriations, and external cultural conditions.

State Tuition Policies. A review of the literature reveals four broad approaches used by states in setting tuition rates for their public post-secondary institutions. McKeown (p. 5) identified three approaches that typically use a predetermined relationship between tuition and another factor. The relationship often is specified in law or a formally adopted policy, although in some instances it is applied informally. The three approaches are the use of economic indices, the cost of instruction, and tuition rates at benchmark institutions to set public institution tuition rates. Curry (p. 6) describes a fourth approach as the revenue method. The distinctions between the approaches are not always clear in practice, and some states employ more than one approach.

Economic Index Approach. The first approach consists of adjusting tuition rates based on the change in a specified economic index. The index might be an index of prices such as the Consumer Price Index or the Higher Education Price Index. Alternatively, the index might measure changes in individual income such as per capita personal or disposable income. The use of such an index, if applied uniformly to all tuition rates, serves to perpetuate the relationships that existed among the

rates when the policy was adopted. In response to a 1988 survey, 14 states reported using the Consumer Price Index, 12 reported using the Higher Education Price Index, and 7 reported using a measure of personal income either formally or informally in setting tuition rates (Mingle, p. 7).

Cost Approach. The second approach consists of establishing tuition rates or levels of tuition revenue in relationship to some measure of the cost of providing instruction. The relationship between tuition and cost and the measure of cost varies. The relationship between tuition and cost may be uniform for all students, institutions, or groups of institutions. Alternatively, the relationship may vary by level of instruction, residence status, and/or type of institution, as it does for the Minnesota systems. Some states use instructional cost and others use state appropriations as the cost measure. McKeown (p. 5) found that the cost measure typically includes direct instructional costs as well as some portion of support costs. The cost approach has the advantage of assigning specific responsibilities to students and the state for financing post-secondary costs. It also can serve to reduce or eliminate inequities in state subsidies. According to Mingle (p. 5), eight states have policies that relate tuition revenue and four have policies that relate tuition rates to the cost of instruction or the level of state appropriations.

Benchmark Approach. The third approach consists of establishing tuition rates on the basis of the rates at benchmark institutions. The benchmark institutions are typically those that

compete for students. They may be in the same geographic region or located throughout the country. While this approach may help maintain competitive tuition rates, it also places the institutional pricing decision in the hands of other institutions. Mingle (p. 7) reported that tuition levels at peer or competing institutions played a formal or informal role in 33 states' tuition setting decisions.

Revenue Approach. The fourth approach tends not to be as formally specified as the other three. This approach may employ several objective and subjective factors in setting tuition. Marks (p. 13) characterized this approach as one that sets tuition "to generate all or most of the difference between what the institutions believed they needed and what state government appropriated." Mingle (p. 5) reported that 25 states view tuition as the difference between institutional needs and state appropriations.

State Appropriations. The level of state appropriations appears to be a significant influence on tuition rates. Sixty-two percent of State Higher Education Executive Officers (SHEEOs) surveyed recently agreed that public tuition and fee rates "are driven primarily by the amount of state appropriations available in a given year" (Mingle, p. 23). This relationship can be either negative or positive.

Wittstruck and Bragg (p. 21) found that in the short term, higher increases in state appropriations were associated with smaller increases in tuition and that the reverse also was true between 1973 and 1988. One-third of the SHEEOs said increases in appropriations often are used as a rationale for "holding the

line" on tuition increases (Mingle, p. 26). This relationship appears consistent with the state tuition policy characterized as the revenue approach. When state appropriations do not increase sufficiently to finance desired spending levels, larger tuition rate increases are used to achieve the desired level of expenditures.

Wittstruck and Bragg (p. 36) also concluded, however, that tuition rates increase with appropriations in the long term. This finding is consistent with a cost or appropriation indexed tuition policy. Increases in state appropriations are matched by tuition increases.

Cultural Conditions. A state's collective values and attitudes regarding post-secondary education are a significant influence on tuition rates. The extent to which a state values access to post-secondary education and the way it chooses to promote access affect tuition rates. Some states choose to promote access by maintaining tuition rates as low as possible. Others have higher tuition rates and promote access through financial aid. States' attitudes regarding the relative benefits of post-secondary education to the student and society clearly have an affect on tuition. States that consider society's benefits to be more significant are likely to have lower tuition rates than those that consider the student's benefits to be more significant.

Post-Secondary Community Influences

The post-secondary community exerts influence on public post-secondary institution's tuition rates through competition. Many

institutions compete regionally or nationally for students. As a consequence, tuition rates charged at competing institutions are an explicit or implicit influence on an institution's tuition rates.

System and Institutional Influences

System and institutional influences include both material and cultural conditions.

System and Institutional Material Conditions. A system or institution's cost of instruction influences its tuition rates. The nature of that role depends in part upon the state tuition policy. The revenue approach, for example, calls for students to finance cost increases not financed by the state or local governments. The cost or appropriation index approach calls for the state and the students to share responsibility for financing increases in cost. The mission of the institution, to the extent that it affects costs, also affects tuition rates. The wide range of undergraduate, graduate, and professional programs offered by the University of Minnesota, for example, affects its costs. As a consequence of the range of programs and their costs, undergraduate students pay higher tuition rates than they would if those programs did not exist.

System and Institutional Cultural Conditions. The values, attitudes, and norms that a system or institution holds also influence its tuition rates. The Minnesota public system governing boards have the authority to establish tuition rates, including those charged non-residents. The University of Minnesota Board of Regents, for example, has taken the position that

tuition rates charged in each collegiate unit should be adjusted in a manner that moves them toward the systemwide average of tuition as a percent of instructional cost. This policy reflects the belief that subsidies across units should be reduced. The governing boards of the other public systems, however, charge a uniform tuition rate for all state residents at each level of instruction. This policy reflects the belief that subsidies across programs and institutions are appropriate. All four public systems charge higher tuition rates for non-residents than for state residents. These differentials vary among systems and within systems. They reflect system values and attitudes regarding the desirability of non-resident students and the benefits that the non-resident students receive.

FOOTNOTES

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APPENDIX B. DATA SOURCES AND METHODS

Several sources of data were used to examine trends in post-secondary institutions' costs, tuition rates, and available financial aid. In addition, information on several price indices is used in examining trends over time. This appendix describes the data and the methods of analysis used.

DATA SOURCES

The data sources include the Minnesota public post-secondary systems, the United States Education Department's Higher Education General Information Survey (HEGIS), Research Associates of Washington, the Coordinating Board, and the National Association of State Scholarship and Grant Programs (NASSGP). Each source is described in this section.

Systems' Data

Data on the public systems' aggregate general fund instructional expenditures, full-year equivalent or average daily membership enrollments, state supported debt service, and tuition rates were used to examine trends in their post-secondary costs and tuition rates. Although aggregate expenditure data are available for research and public service activities, there are no generally accepted volume measures that would allow an examination of per unit expenditures. Consequently, this study focuses exclusively on expenditures for instruction.

These data were obtained directly or indirectly from the systems. The expenditure, enrollment, and debt service data were

obtained from the Minnesota Department of Finance. The staff of each system prepare these data as part of their system's biennial budget request. Department of Finance staff assembled a data base in Fall 1988 that contains the expenditure, revenue, and enrollment data for each system. The Department of Finance is responsible for making the state's debt service payments. The data on tuition and required fee rates are collected annually from the systems by Coordinating Board staff.

Definition. The expenditure and enrollment data were used to calculate each systems' operating cost of instruction per student. Total instructional expenditures were divided by full-year equivalent and average daily membership enrollments.

The amount of instructional expenditures in a given year is determined by conducting a cost study or estimated using the results of a cost study from another year. General fund instructional expenditures are the portion of a systems' operating cost of instruction that is included in the state's accounting system and funded by the state's funding policy. In general, this category includes instructional expenditures that are supported by state appropriations and tuition revenue. Instructional expenditures supported by other sources of revenue are usually excluded. One exception is that a portion of instructional expenditures supported by federal revenue is included for the Minnesota Technical Institute System. The instructional expenditures for fiscal year 1989 are estimated.

Full-year equivalent and average daily membership enrollments are the measures of the volume of degree or certificate creditable

instruction that are used in the state's funding policy. Full-year equivalent enrollment equals the total number of student credit hours generated during a fiscal year divided by theoretical fiscal year full time load for each level of student. Undergraduate and professional credit hours are divided by 45 and graduate credit hours are divided by 30 to obtain full-year equivalent enrollments. Average daily membership enrollment equals the total number of hours of enrollment in Minnesota Technical Institutes divided by 1050. The denominator is the number of hours that a full time student would enroll for during three quarters. The enrollment data for fiscal year 1989 are estimated.

State debt service payments are used as an estimate of post-secondary institutions' capital cost of instruction. The available data on state debt service, however, include payments for all state financed facilities. This includes facilities that support the instruction, public service and, where relevant, research missions of the public institutions. Nor do the debt service data represent the total amount incurred by or for the public post-secondary systems. Finally, historical data on debt service are not available.

The tuition rates are the amount that a Minnesota resident student would pay if he or she enrolled for a full-time load of 15 credits at the undergraduate level or 10 credits at the graduate level in each of the three quarters during an academic year. The State University System, the Community College System, and the Technical Institute System charge one tuition rate for all resident undergraduate students. The University of Minnesota charges

several tuition rates for resident undergraduate students. The rates used were an average of the lower and upper division rates for the unit with the lowest and highest upper division rates on the Twin Cities campus. The required fee rates are those that full-time undergraduates would pay during three quarters of an academic year.

HEGIS Data

Data on United States post-secondary institutions' expenditures, enrollments, and tuition rates were used to compare trends in costs and tuition rates for Minnesota public institutions with the trends for institutions in other states. These data are collected by the U. S. Education Department through HEGIS. HEGIS consists of several surveys that collect data on enrollments, finances, staffing, degrees granted, and institutional characteristics from post-secondary institutions in the United States. Data on institutions expenditures were obtained from the "Financial Statistics of Institutions of Higher Education" survey for fiscal years 1978, 1983, and 1986. The enrollment data were obtained from the "Fall Enrollment in Institutions of Higher Education" survey for 1977, 1982, and 1985. Data on tuition rates were obtained from the "Institutional Characteristics" survey for academic years 1977-78, 1982-83, and 1985-86.

Definition. The HEGIS expenditure and enrollment data were used to estimate the operating cost of instruction per student for all public institutions in the HEGIS universe.

The operating cost of instruction was estimated by summing expenditures for direct instruction and student support services

and a portion of expenditures for academic support, institutional support and physical plant operations. The portion of these support program expenditures attributed to instruction was equal to expenditures for direct instruction as a proportion of total expenditures for direct instruction, research and public service. This calculation only approximates the operating cost of instruction. The average costs presented are a weighted average for all institutions in the category.

Full time equivalent (FTE) enrollment was estimated by adding fall term full-time headcount to one-third of fall term part-time headcount. Headcount refers to the number of individuals enrolled at a point in time. This calculation is a crude approximation of FTE since assumes that all students reported as full-time average a full-time load and that all students reported as part time average one-third of a full time load. The estimated operating cost of instruction is based on total fiscal year expenditures and fall term enrollments.

The undergraduate and graduate tuition and required fees are intended to represent typical rates as defined by the institution staff completing the HEGIS survey. The average tuition and required fee rates presented are a simple average of the rates reported by all institutions in the category.

Universe of Institutions. The HEGIS universe of institutions excludes the Minnesota Technical Institutes and most public and private post-secondary vocational institutions in the other states. The Education Department began implementation of the Integrated Postsecondary Education Data System (IPEDS) surveys in

1986 and completed implementation in 1987. The IPEDS surveys replace the HEGIS surveys. The IPEDS universe of institutions includes all public post-secondary vocational institutions as well as all institutions included in the HEGIS universe. The majority of the data used for this study, however, were collected only for institutions in the HEGIS universe. Consequently, all Minnesota Technical Institutes are excluded from the analysis that compares cost and tuition trends in Minnesota institutions with those of institutions in other states.

Limitations. The HEGIS data have several limitations, including the universe of institutions, reporting problems, and funding differences (Maryland State Board for Higher Education, p. 1).

There are major differences among institutions in the functions that are included in the HEGIS universe. Some institutions for example, include medical schools while others report them separately. Some institutions report financial statistics for agriculture experiment stations, extension services, and research laboratories while others exclude them. System office expenditures are not reported consistently. The HEGIS universe of institutions excludes most public and private vocational and technical institutions.

Reporting practices vary from institution to institution and from state to state. HEGIS surveys allow institutions to choose one of several definitions for reporting certain items. The definitions also are subject to differing interpretations. These differences in reporting are a particular problem with enrollment

data. Institutions do not report the same universe of students. Some institutions, for example, report extension enrollments while others do not. Some report enrollments in courses taught under contract while others do not. Institutions' classifications of students by level of instruction also may differ. The reporting differences also affect the financial data. Some institutions, as a result of their data reporting practices, are required to do several calculations in order to satisfy the requirements on the HEGIS form.

States differ in their funding practices. One state may fund certain programs directly through the institutions, while similar programs in other states may be funded from a central agency. In some states, including Minnesota, most student aid is distributed directly to students while in others it flows through institutions. Aid that flows through institutions will be reported in the HEGIS financial surveys. Some institutions fund debt service directly while others, including Minnesota, use a central agency. Fringe benefits for employees are funded through institutional accounts in some states, including Minnesota, and centrally in others. Such differences in funding practices result in inconsistent reporting of expenditures. Minnesota's post-secondary expenditures for financial aid and debt service are under reported and expenditures for fringe benefits are fully reported.

Christal, Firnberg, and LaCour, (p. 15) found three types of differences among institutions that affect comparisons of expenditures and revenues per student. First, average expenditures and revenues per full-time equivalent (FTE) student differed

significantly depending on the definition of FTE used. The problem results from estimating FTE on the basis of headcount enrollment. Second, the assignment of expenditures to functional categories differed among institutions. Third, the rankings of institutions differed with the definitions and calculations used in providing the data.

Despite these problems, the HEGIS data were used because they are the only data available for higher education institutions in the United States.

Research Associates of Washington

Data on average state and local appropriations and tuition revenue per full-year equivalent student for public post-secondary education were used to compare Minnesota revenue trends to those occurring nationally. These data were obtained from a publication by Research Associates of Washington entitled State Profiles: Financing Public Higher Education 1978 to 1987. This annual publication describes state efforts in financing public post-secondary education and presents only state level data.

Definition. The data on educational appropriations per student include all state and local appropriations for public post-secondary education but exclude identifiable appropriations for research, public service, and medical, dental and veterinary schools. An amount equal to appropriations for financial aid has been subtracted from the tuition revenue since it is included in the appropriations figure. Thus, tuition revenue per student is reduced by an amount equal to state funded financial aid. The

full-year equivalent enrollments are calculated using student credit hours, student contact hours, and the appropriate divisors.

Coordinating Board

Data on combined State Scholarship and Grant Program and Federal Pell Grant Program awards were used to examine trends in need-based financial aid available to undergraduates. These data were obtained from the spending summaries published in the Coordinating Board's biennial reports. The financial aid trends were compared to trends in undergraduate headcount enrollment. The enrollment data were obtained from the Coordinating Board annual Basic Data Series enrollment reports for Fall Term 1979, 1982, 1985, and 1987. The headcount data exclude extension enrollments in all four systems for fall 1979 and in all but the Community College System for fall 1982, 1985, and 1987.

Definition. The data on combined State Scholarship and Grant Program and Federal Pell Grant Program awards represent all state awards plus an estimate of the Pell awards received by state grant recipients. They do not represent all Pell grant awards. Data on awards from both programs are presented because the two programs are coordinated. The amount of the Pell award received by a state award recipient plays a significant role in determining the amount of the state award.

National Association of State Scholarship and Grant Programs

Data on total awards and number of awards for state financial aid programs were used to compare trends in the Minnesota State Scholarship and Grant Program to trends in similar programs in the United States. These data were obtained from a report published

annually for the National Association of State Scholarship and Grant Programs.

Definition. The United States and Minnesota data on total awards and number of awards are for undergraduate need-based competitive and non-competitive state financial aid programs.

ANALYSIS

This section describes the analytic approach, the timeframe, and the institutional classification systems used in examining trends in the operating cost of instruction and tuition and fee rates.

Analytic Approach

The purpose of this study is to examine trends over time in post-secondary costs and tuition rates. The intent is not to examine levels of spending per student or to compare spending levels among institutions.

Two estimates of instructional expenditures and tuition rates are used to examine trends. The trends for the Minnesota public post-secondary systems are examined using the systems' data. These estimates of costs and the tuition and fee rates should be considered reasonably accurate. Minnesota trends are compared with those of public institutions in other states using the HEGIS data. These estimates of costs should be considered approximations because of the method of calculation and the limitations of the HEGIS data. As a result of differences in the methods and data sets used, one cannot compare the costs derived by the two methods.

Timeframe

The timeframe chosen for a trend analysis has a significant influence on the trends observed. A difference of a few years can alter the trend dramatically. The timeframe for this study was determined primarily on the basis of data availability. Minnesota systems' data were not available for fiscal years prior to 1978 and consequently, that year became the base year. Fiscal year 1971 was chosen as a base year for the Minnesota tuition and fee data because of a readily available set of data. Although HEGIS data were available for earlier years, 1978 was chosen as a base year to be consistent with the base year for the Minnesota systems' data. Fiscal year 1986 was the most recent HEGIS data available when the data tapes were ordered. After receipt of the HEGIS data, it was discovered that the information on tuition rates for fiscal years 1983 and 1986 was actually for fiscal years 1982 and 1985 respectively. Consequently, these years are used in the comparisons of trends in Minnesota tuition rates to those in similar non-Minnesota institutions. Fiscal years 1979 and 1988 are the earliest and most recent fiscal years, respectively, for which data on combined state and Pell awards are available. Consequently, data for these years are used in examining trends in financial aid.

Institutional Classification Systems

Two different institutional classification systems are used in examining trends. One is that of the Minnesota governance structure, the four public systems. Since governance structures differ significantly among states, a second institutional

classification system was used for the analysis of the HEGIS data. This second classification system was developed by the National Center for Higher Education Management Systems (NCHEMS). It has 10 institutional categories that range from research university to two-year occupational institution. It is used to control for differences among institutions in the types of degrees offered and the mix of study fields. This section describes the NCHEMS classification system. A list of the Minnesota public institutions in each category of the NCHEMS classification system is at the end of this appendix.

Description. The classification system used in the study was developed by the staff of the National Center for Higher Education Management Systems (NCHEMS). The system contains the following classifications (Christal, Brinkman, and Parker, 1986):

1. **Research Universities** - These institutions have a significant commitment to doctoral-level education and extensive research activities. A research university confers at least 30 doctoral-level degrees in three or more program areas on an annual basis. In addition, it must rank in the top 75 institutions in research expenditures.

2. **Universities** - These institutions fulfill the criteria for a university, but they are not as heavily involved in research activities.

3. **Comprehensive Institutions** - These institutions have diverse post baccalaureate program offerings, but not significant doctoral-level education. The number of doctorates awarded is under 30 annually or there exist fewer than three doctoral level programs which are offered. These institutions must provide a minimum of 30 post baccalaureate degrees and either grant degrees in three or more post baccalaureate programs or have an interdisciplinary program at the baccalaureate level.

4. **Two-Year Institutions** - These institutions confer fewer than 25 percent of their degrees at the baccalaureate level or post baccalaureate level. They also confer 75 percent of their degrees for two years of work or less. Institutions in this category may be either academic/comprehensive or occupa-

tional in nature. A two year institution is considered academic/comprehensive if 80 percent of the degrees awarded are in an academic area, otherwise it is occupational.

5. **Health Professional Institutions** - These institutions confer 60 percent or more of their degrees in health science fields.

6. **Other Professional and Specialized Institutions** - This category includes other health science institutions, education schools, engineering schools, divinity institutions, business and management schools, art, music and design schools, law schools, U. S. Service Schools and other specialized schools.

ECONOMIC INDICES

Several economic indices are used in this study. The Higher Education Price Index is used in the analyses of post-secondary costs to control for changes in price. The Consumer Price Index is used in the analyses of tuition rates to control for changes in price. Changes in costs also are compared to the Gross National Product Implicit Price Deflator, and changes in tuition are compared to an index of changes in Minnesota Personal Income.

Definitions

The objective of a price index is to measure changes in prices over time. Indices are constructed in an attempt to eliminate the effects of all other factors on changes in spending. The quality and mix of goods and services are held constant. In measuring changes in prices only, indices measure changes in the purchasing power of a given level of spending.

The Higher Education Price Index (HEPI) measures changes in the prices of a fixed set of goods and services purchased by colleges and universities. The HEPI measures changes in the prices of professional and non-professional personnel compensation, services, supplies, equipment, books and periodicals, and

utilities (Research Associates of Washington, 1988a, p. 12). It does not measure changes in the prices of goods and services for sponsored research or auxiliary enterprises.

The HEPI, as do most other indices, has some limitations. The use of a fixed set of goods and services means that changes in the actual mix will make the index less reflective of post-secondary institutions' costs. The HEPI measures price changes for colleges and universities and, consequently, may not be entirely appropriate for examining costs in the Minnesota Technical Institute System. Another criticism is that many colleges and universities have some influence over the prices they pay for personnel compensation and, consequently, some influence over the index. Despite these limitations, the HEPI is the best measure of change in the prices faced by post-secondary institutions.

The Consumer Price Index (CPI) measures change in the prices of a set of consumer goods and services. The type and quantity of goods and services are fixed and were established in 1967 for a typical urban family. The index measures changes in the prices of food, clothing, transportation, fuel, household supplies, health services and materials, recreational goods and events, and shelter. The CPI is used to deflate changes in tuition and required fee rates. Tuition and fee changes are thus viewed in contrast to changes in the prices of other goods and services purchased by consumers.

The Gross National Product (GNP) Implicit Price Deflator measures the average price change from a base year in the total

United States output of goods and services (Ohara and Sicignano, p. 73). The Deflator in not a true price index since changes in the components of the Gross National Product are weighted by their proportion of the GNP each year, rather than by a fixed proportion. Hence, changes in the Deflator also reflect changes in the mix of goods and services that make up the GNP. The Deflator is used as a broad measure of inflation in the U. S. economy.

An index of change in Minnesota personal income also will be used. It measures changes in current income received by individuals and certain private funds in Minnesota. It includes income from all sources minus payments for social insurance. It is used in examining changes in tuition and required fee rates.

FOOTNOTES

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MINNESOTA PUBLIC INSTITUTIONS IN NCHEMS CLASSIFICATION

Research Universities

University of Minnesota Minneapolis-Saint Paul

Comprehensive Institutions

Bemidji State University
Mankato State University
Moorhead State University
Saint Cloud State University
University of Minnesota Duluth
Winona State University

General Baccalaureate Institutions

Metropolitan State University
Southwest State University
University of Minnesota Morris

Two-Year Academic and Comprehensive Institutions

All Minnesota Community Colleges

Two-Year Occupational Institutions

University of Minnesota Crookston
University of Minnesota Waseca

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