A SIMULATION MODEL FOR ANALYSIS OF

ALTERNATIVE FINANCIAL POLICIES

AT THE STATE LEVEL

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PREFACE

Since embarking on a career in education, I have long been interested in the planning process, particularly with respect to the planning associated with state coordination of higher education. Even as some talk focuses today on the diminuation of the coordinating process in some states, one would assume at least a general overall continuation of some form of planning for higher education at the state level, whether accomplished by a legislature, a coordinating agency, or a combination of both. Consequently, with this idea in mind, I wanted to determine if a tool could be developed which could assist higher education planners in assessing the effects of alternative financial policies on the principle components of higher education: institutions, governments, and students. The result is a State Model for Higher Education Financial Policy Assessment.

The process was time consuming in both gathering data for the model and perfecting its structure. Essentially, what was developed was a cost accounting system for analyzing the effects of various financial policies on higher education. Despite some protestation from individuals concerned about gathering data from the private sector institutions in Oklahoma, the model attempts to deal with the total higher education picture.

It is hoped that this model, or others which may be developed from it, will assist planners to make the important decisions confronting

them. The Oklahoma model is, therefore, an interrelated one which recognizes the fact that a particular policy in the public sector may indeed have an effect on the private sector. This idea is not new or profound. However, most models previously constructed tend to overlook, or at least underestimate, the dynamics of financial policies within the public-private system.

The development of the model needed many friends, much assistance, and a great many rewrites before completion. I would like to acknowledge them here. First to Dr. Dan Hobbs and Dr. Joe Leone in the Oklahoma State Regents for Higher Education office. Base year data gathered from their files and reports made the model a reality. The cooperation of both of them in helping me to secure valuable information needed for the model is greatly appreciated. Likewise, a special thanks to Dr. Jim Reid, President of the Oklahoma Association of Independent Colleges and Universities. His assistance in providing information from the private sector was invaluable.

Two individuals in the Oklahoma State Computer Center also deserve special attention. Eldean Bahm was always available for assistance with program problems and, particularly, Jerri Nunley, who was most helpful in writing and rewriting the computer program.

The model could not have been developed without the inspiration, care and assistance of Dr. William Adrian who advised the study. His patience and understanding are fully appreciated. Also, Dr. Larken Warner's untiring and relentless scrutiny of the manuscript helped to refine and provide a clear understanding of the model. Without the support and concern of these two individuals, the thesis would not have been possible.

Finally, the love and understanding of my family, Tarre, Kelly and Kristen, through a difficult and taxing period is hereby acknowledged. Although the thesis deals with the academic and complex problems of financial planning at the state level, they remain as the spiritual inspiration for the completion of the work. Their support and assistance cannot be diminished, and it is to them that this study is dedicated.

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CHAPTER I

THE RESEARCH PROBLEM

Introduction

The complex issues and questions relating to higher education finance have never been easy to solve. Reports, studies, and books have been written involving issues concerning topics from who should pay for higher education to what should be the policy of a particular state toward the financing of private higher education with public money. Finance is intrinsically intertwined with many of the other issues facing higher education today such as promotion and tenure, governance, and academic freedom. Changes in current federal policy toward higher education are as frequently reviewed as the number of new Presidents who are elected every four years. Historically, over recent years, the Democrats, particularly during the Johnson administration, tended to be more liberal and willing to experiment with new programs than their Republican counterparts. Education, therefore, and particularly the financing of higher education, has the potential for being a major issue in national campaigns.

As higher education finance becomes more complex, as the issues become more diverse, those who study and make policy decisions struggle with a plethora of data in an attempt to design financial policies which best fit the needs of their district, state, or nation. The problem

which this study addresses, is: how policy makers can better prepare themselves to make those decisions, and can tools be devised that will assist them in that endeavor?

Statement of the Problem

Historically, state level policy makers have generally relied on historical data in the areas of enrollment, budget and tuition, in forming policy. Legislators depend on the testimony of coordinating agencies and other experts which help them formulate policy decisions. State and regional customs and histories also influence higher education financial policy at the state level. A number of instruments have been designed and tested to assist policy makers. Some of the major instruments will be reviewed in detail later in the study.

This study's primary objective was to develop an instrument to assist state financial planners to assess alternative financial policies in Oklahoma. Such an instrument could enable interested parties to explore a number of alternative financial policies with respect to analyzing the interrelated effects of those policies on the issues of access, choice and cost.

The Oklahoma model was patterned and influenced by one which was constructed in 1973 by the National Commission on Financing Postsecondary Education.[1] In its concluding remarks the Commission recommended:

> . . . that federal, state, and other policy makers for postsecondary education use an analytical framework similar to that described in this report for considering financing proposals. . .

> . . . and further research on, and development of, analytical frameworks and models similar to those used by the Commission. The Commission also recommends further collection and analysis of data which, although currently not available, would be useful for the evaluation of the impact of major financing alternatives on the achievement of national objectives, particularly objectives related to institutions, such as diversity and excellence.[2]

Purpose of the Study

The purpose of this study was, in part, to respond to the Commission's charge, and, further, to assess several policy options that one would consider appropriate for study and analysis at the state level.

One important feature of the NCFPE model involves the establishment and interaction, or influence, of five finance components which influence access, choice and cost. Those components include: 1) Tuition levels, 2) Enrollment levels, 3) Institional expenditures, 4) State revenues, and 5) Student aid. The proposed model in this study would be designed for use in state-level analysis and would be flexible enough to address a variety of policy questions such as:

1. How would alternative tuition policies affect institutional sectors and types with regard to enrollment and costs?

2. How would alternative tuition policies affect state costs of higher education?

3. How would changes in student financial aid at the federal or state level affect different institutional sectors and types?

4. How would a tuition equalization grant program, or voucher program, affect enrollments and costs in both the public and private sectors.

Assumptions

The model's design allows for a variety of assumptions to be

analyzed regarding tuition policy, the effects of policies on enrollments and costs, and the interrrelationships among various financial variables. The model will not be able to address every policy question or issue. It could, however, serve as a tool for planning and reviewing policy options at the state level. Indeed, one of the objectives of the study is to assess several different policies at the state level.

Significance

The significance of the model is dependent upon its usefulness in addressing state policy questions. If the model proves effective in assisting policy makers, a number of groups could benefit including legislators, special interest groups, educators, institutional administrators, and researchers. In addition to the NCFPE model, a few attempts have been made to develop models at the state level. In Oklahoma, administrative officials from both the public and private sectors have indicated a keen interest in the development of the model.[3]

Definitions-Access, Choice, Costs

Before continuing, some attention should be given to the major issues involved because they are central to the development of the simulation model. In its effort to help set the stage for building some form of federal policy, the National Commission on the Financing of Postsecondary Education established eight criteria that would be used to measure eight objectives. Among the eight objectives were the identified areas of student access, student choice, and adequate financial support.[4] The simulation model for Oklahoma focuses only on access and choice, and adequate financial support identified as costs. The

following definitions are, therefore, offered to operationalize the major concepts which were included in the simulation model.

ACCESS is defined as the opportunity for each individual to be able to enroll in some form of post-secondary educational institution appropriate to that person's needs, capabilities, and motivation.

CHOICE is defined as the opportunity for each individual to have a reasonable alternative among those institutions that have accepted him or her for admission.

COSTS are defined as the necessary funding level (institutional, governmental, family-generated) with which a particular policy is implemented.

Thus, access focuses on the number of students attending higher education institutions, while choice focuses on the distribution of those students into types (e.g., 2-year, 4-year, and university) and sectors (public and private).

In summary, the purpose of the study was to develop a cost analysis simulation model for state level planners that could assist them in making decisions regarding the issues of student access, student choice, and their related costs to relevant constituencies. In addition, three alternative financial policies were tested utilizing the model as a means of demonstrating the feasibility and potential usefulness of the model for policy planners at the state level.

Subsequent chapters include the following: Chapter II is a review of the literature relevant to the study. Chapter III contains a discussion of the model design and methodology of the study and three alternative policy questions to be tested. Chapter IV reviews higher education

in Oklahoma Chapter V contains the results of the testing of alternative policy questions and Chapter VI contains a discussion of the findings and conclusions of the study.

ENDNOTES

[1]National Commission on the Financing of Postsecondary Education, Financing Postsecondary Education in th United States (Washington, 1973), pp. 229-243.

[2]Ibid., pp. 352-353.

[3]Dr. Dan Hobbs and Dr. Jim Reid. Personal Interviews. Oklahoma City, Oklahoma, April, 1982.

[4]Natinal Commission on the Financing of Postsecondary Education, pp. 53-58.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

The literature review assesses work in the financial policy analysis field according to the following framework. First, the major influences on financial policy study were reviewed. Second, because policy analysis usually involves the study of issues, two major issues and their findings, which are relevant to the state policy model, were be reviewed. The issues include: 1) who pays? who benefits? who should pay?, and 2) Public Support for Private Higher Education. Third, the concept of low tuition, which is relevant to the state policy model, was reviewed. Fourth, studies which have researched the effects of tuition on enrollment were reviewed. Fifth, the development of simulation models were explored, and, sixth, the model which had the most direct influence on the development of the state policy model developed by the National Commission on the Financing of Postsecondary Education was examined.

Questions and issues regarding higher education finance have been explored since Harvard College was founded in the 1600's. Earlier concerns of institutional financing seem today somewhat dwarfed by such issues as who should pay and who benefits from higher education, as explored by the Carnegie Commission on Higher Education.[1] The National

Center for Higher Education Management Systems (NCHEMS) explored questions and issues in a variety of areas and was instrumental in developing a uniform model by which state coordinating agencies and institutions could share information, particularly financial information.[2] The Education Commission of the States (ECS) studied the relationship between the states and private higher education financial policy. As a result of the study, ECS now regularly publishes information describing the various policies and their dollar amounts for states which have programs that provide public funds for private higher education.[3] Other groups, commissions, panels, governmental agencies, and individuals studied issues involving student access, choice, and equity.[4] Generally, the body of knowledge regarding higher education finance may be divided into the areas of state and federal policy as these policies affect the public and private sectors. One author, however believes that the current American higher education system is not so distinct. John C. Honey believed that the system is one enterprise comprised of the direct and indirect relationships between the states, the federal government and institutions relative to student loans.[5]

The serious study of higher education finance began in 1950 when Richard Millet published Financing Higher Education in the United States.[6] The report represented the first definitive survey of American higher education finance and was one of the first major efforts to assess the general character of the American higher education finance. Millet also directed the Commission on Financing Higher Education which reported to the Rockefeller Foundation. The Commission's report, and others that would follow, were largely descriptive and made little or no attempt to discuss policy making or issues. The study investigated the

major area of objectives, costs, income sources, and the needs for future financing opportunities. Data were listed in 82 tables and two charts reporting such items as total endowment income of public institutions to the percentage of per-student appropriations per capita income payments in 47 states.

Nearly 20 years later, Glenny and Kidder, in a report prepared by the Education Commission of the States entitled, "Trends in State Funding in Higher Education: A Preliminary Report," surveyed 42 of the 50 states to determine some general characteristics and patterns of higher education finance in the states.[7] Glenny and Kidder outlined five major areas where trends were identified and quantified: 1) Total state revenue increased for a 5-year period, 1967-68 through 1971-73, by about 67 percent, 2) Appropriation for education at all levels by the 42 states did not rise as rapidly during that same period of time, increasing by 59 percent, 3) Education's share of total state revenue dropped from 53 to 51 percent despite an enrollment increase at the elementary secondary level of 5 percent, 4) Higher education public institutions increased these appropriations by 83 percent with an enrollment increase of 40 percent while the share of total state revenue rose slightly from 14 to 15 percent, 5) Private institution's state revenue share increased better than 3 times, resulting in a 31 percent increase. These reports were examples of descriptive data.

Major Influences on Financial Policy Study

Much of the work accomplished in the study of state finance policy was preceded and influenced by a handful of either individuals or blue ribbon commissions whose task it was to describe the current state of

affairs and make recommendations regarding the future direction finance should take. There were five principal influential bodies that participated that did much of their work in the 1970's.

The Committee for Economic Development reviewed undergraduate education in the collegiate sector.[8] The Committee's major recommendation included the reallocation of public resources emphasizing increases in grants directly to students; increasing tuition in the public sector; and using the added income in the form of student aid to lower-income students for equalizing educational opportunities. Regarding access, the Committee stated that there was a need to equalize education opportunity for students. The Committee also recommended that public tuition be raised until it reached 50 percent of the cost of instruction. In the area of student aid, the Committee recommended focusing attention on programs which directly benefited students as opposed to those which benefited institutions, and that increased tuition income should be redistributed for student aid for students from low-income families.

The Carnegie Commission on Higher Education issued a total of four reports which addressed the issues of access, choice and opportunity. Focusing on the collegiate sector, the Commission recommended increasing the federal support to higher education, and suggested that tuition should be set on a graduated basis by level of student, that tuition be increased in the public sector and reduced at the lower levels. Regarding access, the Commission supported removal of the financial barriers then in existence by fully funding the Basic Education Opportunity Grants (BEOG), and substantially increasing student aid. The Commission strongly supported the idea of universal access to higher

education, particularly among lower socio-economic groups.

In 1973, a special task force of the Secretary of Health, Education and Welfare focused on the federal role the government should play in both the collegiate and noncollegiate (vocational-technical and professional) sectors.[9] The task force produced a document entitled, The Second Newman Report, and recommended that all public and private institutions should be made competitive with each other for students and resources. The task force addressed the issue of access by recommending that all postsecondary education should be made available to all segments of the population including minorities. Although the task force made no specific recommendations regarding tuition, it did recommend that student aid be used to bridge the tuition differential between public and private institutions.

From 1972 through 1974, the National Board on Graduate Education issued three reports which addressed the issues of access, tuition, and student aid at the graduate level. The focus of the Board's recommendations on access aimed at insuring that graduate education would be opened more to minorities including women and older students, as well as improving the availability of financial resources and types of environments that provided reasonable opportunities for program completions. The Board recommended maintaining tuition below full cost levels. Regarding student aid, the Board recommended the establishment of federal fellowships for graduate education at a cost of $48 million, traineeships for students in programs oriented toward such urgent social problems as energy, health care and mass transportation, and increasing loan limits to graduate students from $15 thousand to $20 thousand.

The fifth and final major study was issued by the National Commission on the Financing of Postsecondary Education.[10] Focusing on both the collegiate and noncollegiate sectors, the Commission assembled data on postsecondary education in the United STate and used them to analyze alternative financing policy proposals in a systematic way. The NCFPE model will be explained further and in more detail later in this chapter. In the area of access, the Commission expressed concern that students from lower income families (under $10,000) were participating in higher education at only about half the rate at which students whose parents were in higher income brackets were participating. The Commission also was concerned about the participation of minorities including Blacks and women. With regard to tuition, the Commission recommended generally that anyone who made policy, at any level, should do so by developing an analytical framework similar to the one the Commission used. Tuition, student and institutional aid policy decisions should be based in the future, the Commission said, on reliable data, and that when a framework was constructed to analyze the impact of an alternative financial policy, conditions would generally dictate policy. In addition, the Commission recommended that national standards be established to determine the relative financial status of different types of institutions; that appropriation of funds during periods of substantial shifts in financing public programs should be effected over a reasonable period; that the interrelationships of research, graduate and undergraduate programs be studied to better understand the induced financial effects of individual program financing decisions; and that grants and contracts with institutions either should include long-term programmatic support that recognized the interrelationships among the

various functions of the institution or should cover the costs associated with purchasing the service as if it were provided separately from other functions within the instition.

The Commission's approach to financial policy making was unique and different from any of the four previous Commissions or Committees in that the NCFPE Commission recommended that policy be determined, at least in part, through the gathering of reliable information, recognizing the interrelatedness of a number of variables associated with the information, and setting a policy which best fit stated criteria and objectives as best it could. This point is also central to the development of the Oklahoma state finance model. The NCFPE model will be reviewed in detail in Part 2 of this Chapter.

These five reports, the data that were gathered in them and the issues that were raised, developed a base upon which other studies and papers were written. Because the study of state financial policy is generally issue-oriented, a further review of the literature follows as that literature relates to the appropriate major issues involved in studying state financial policy.

Major Issues and Findings

Before reviewing the primary works which influenced the state model, a discussion of the major issues, and related studies, is presented. These issues are: (1) Who Pays? Who Benefits? Who Should Pay?, and (2) Public Funding of Private Higher Education.

One of the primary reasons for constructing the state simulation model for financial policy analysis was to assess the usefulness of an analytical, systematic approach to making and establishing policy. It

is, therefore, appropriate here to review some of the major issues in the financing of higher education at the state level.

While there are a number of issues involved within the higher education finance area, this study focused on those issues associated with who benefits and who pays for higher education and issues which are associated with questions related to access, choice, and costs.

Who Pays? Who Benefits? Who Should Pay?

In its 1973 document on the beneficiaries of higher education, the Carnegie Commission on Higher Education stated the question in this manner:

> If we could come to some agreement about who benefits from the activities of higher education, and to what extent, we would have a rational basis for allocating costs among these beneficiaries.[11]

Insofar as the study's intent was not to determine which issue should or should not be selected to guide a particular policy, a review of the commission's questions and responses follows. The major issue is whether the individual or society benefits from higher education. The Commission roughly estimated that over the past thirty years, society was paying more of the share of educational costs, about 2/3 by state, local and federal, and private philanthropy. The individual paid about 1/3.

Regarding who benefits from higher education, the Commission pointed out that the individual receives direct benefits in the form of a substantial rate-of-return on a college degree and receives indirect

benefits from the improvement in quality of life. In terms of societal benefits, the Commission said that society enjoys the benefits of a more educated, productive workforce as a direct benefit. Indirectly, the Commission, and others such as Withey and Hyman, said that society benefited from ". . . improved political participation, better interpersonal relations, and better health."[12]

The arguments regarding who should pay may be summarized as follows:

1. Many economists, particularly Milton Friedman believe that the individual should pay because the student is the one who received the most direct benefits which far outweigh the benefits enjoyed by society. Friedman and others believe that the federal government should maintain a low-key posture in the financing of higher education.

2. Many individuals, particuarly those employed in higher education, believe that society benefits the most from higher education and as a result, society and taxpayers should bear the cost of financing higher education. Supporters of this belief would keep tuitions low, provide state aid for higher education, and support continued injections of federal dollars into the system.

3. The Carnegie Commission, the Second Newman Report, and a study by the Committee for Economic Development believed that both society and the individual benefit, but most likely the individual benefits more. These reports support a modest rise in tuition rates in the public sector to help offset the tuition gap between private and public institutions; state aid to private institutions; and federal support for higher education primarily through the mechanism of student aid to help the disadvantaged and minorities.

These issues are central to answering key financial questions such as who should bear the burden of tuition costs, the taxpayer or the student or family; what should be the governmental response to providing universal access (at all levels); and what should be the extent of federal and state support of higher education?

These questions and issues are important and underpin the framework for the simulation model. Although there are many other issues, those involving tuition, student aid, and costs are the issues with which the state model is primarily concerned.

Public Support for Private Higher Education

Another issue related to access and choice is whether states and/or the federal government should help finance private higher education, long regarded as a most integral part of the American higher education picture. In Millet's Financing Higher Education in the United States, little attention is given to the issue.[13] Nevertheless, Millet did urge that states increase their support of private higher education and that it be accomplished through the issuance of scholarships and grants. Millet also cautioned that states would only be successful in helping to preserve private higher education if a proper balance could be achieved between equitable appropriation and institutional autonomy.[14] In most states, the preservation of private, institutional autonomy is central to the question of whether states should finance private higher education.

Another important aspect of the public-private issue centers on the separation of church and state idea which is contained in the U.S.

Constitution. Most of the argument regarding the issue has been left to state court decisions with the U.S. Supreme Court choosing not to become involved. The extent of the involvement by state courts is extensive and varied. Outcomes often did not follow federal constitutional guidelines. Instead, they reflected local attitudes and customs. Often, history played a major role:

> When admitted to the Union, New Mexico lacked a public school system. Parochial schools, mostly Catholic, had a near monopoly on education; indeed the threat to this monopoly in constitutions proposed for the would-be state contributed to their defeat by the people. But Congress conditioned admission of the territory on the approval of a strong constitutional provision requiring the establishment of a public school system and barring aid to private schools.[15]

Different states have allowed various types and amounts of public funds to be appropriated for higher education. This diversity is manifested in a number of ways. The Education Commission of the States has issued an annual report of state support for higher education since 1970. The latest study (1979) listed six major categories in which states supported private higher education:

1. Contracts
2. Direct Aid
3. Disadvantaged Minorities
4. Facilities/Assistance Authorities
5. Medical-Dental-Nursing
6. Student Assistance

A survey to study the impact of state funding on the private sector was conducted in 1979.[16] The survey's results helped to describe the increased activity in the level of funding which states were providing to

private higher education:

1. Marked increases in the number of aid programs available in the six-year period, 1973-79 including direct and indirect grants and federally-shared scholarships.

2. A dramatic increase in the overall level of activity in the six major categories listed by ECS. Total appropriations for the six-year period was over $780 million.

3. Nearly 60 percent of the appropriations were in the form of student aid, either need or non-need based.[17]

Another study further showed the continuing pattern of increased public funding of private higher education. Prepared by WICHE, the report surveyed total aid in 1979 and showed that:

1. Total Direct Aid (categorial and non-categorical) of $129.3 million.

2. Total Student Assistance (Independent only) of $83 million (need based), $34.6 million (non-need based).

3. Independent state college students received $362 million.[18]

Studies such as those mentioned would seemingly indicate that the question of whether public dollars should be appropriated to private higher education is moot. However, the issue remains open to debate as evidenced in the state of Texas. Texas was one of the first states to initiate public funding programs for private higher education. The Texas Tuition Equalization Grant program was authorized by the legislature in the early 1970's. Nearly ten years later the state's Director of Financial Aids suggested in an interview that the issue was still hotly contested behind closed and open doors in Austin.[19]

A number of major reports, including the Carnegie Commission,

Bundy Report in New York, The Illinois McConnell Commission, the Massachusetts Saltonstall Commission, and studies in Texas and Missouri, advocated the idea that preservation of the private sector in American higher education was desirable for the system as a whole.[20] These reports argued that the continuance of diverse educational elements, which offer unique educational settings and teaching designs, was fundamental to American higher education, and that substantial losses of institutions in the private sector diminished the overall systems.

Berdahl took the diversity point a step further. He embraced the concept of defusing the "climate of conflict" that developed naturally between the public and private institutions in a period of declining enrollments and adverse economic circumstances:

> One can anticipate more public-private conflict in states where fiscally conservative political leaders act to hold down state expenditures in general and higher education appropriations in particular, or where the values of the state political leaders cause them to take a strong stand for one sector or another . . .
>
> Presumably most leaders have arrived where they are learning how to avoid stands that engender conflict and backlash. . . . preferences for greater accountability and for less government. The fate of the private institution rests in part on that resolution.[21]

The final argument in support of private higher education receiving public funds is that it will lose its ability to attract students because of the existing tuition gap between the public and private institutions. Although certain studies have shown that the tuition gap is real, generally, it is very difficult to determine the effects that the gap have on enrollment patterns. This was shown in a recent study by the Education Commission of the States.[22] In a survey of states using

ECS data, top ten (by total appropriation) and bottom ten states were identified based on total levels of support for private higher education The study showed the overall differences between the two groups was almost negligible. Although the gap increased from 1973 to 1979, the increase was not appreciable. Consequently, the study was able to substantiate that there was a tuition gap, but was unable to accurately assess the impact of public dollars on private enrollments.[23] Breneman and Finn cautioned that the tuition question is not, however, unimportant:

> While such factors will continue to be important, the tuition gap is likely to be of greater significance in an era of stable of declining enrollments. The literature on demand for higher education suggests that, although the decision to enroll in college is relatively insensitive to modest price changes, the decision where to enroll is quite sensitive to changes in relative charges of competing institutions . . . policies to prevent the public-private tuition gap from further widening are important to the welfare of most private institutions.[24]

In summarizing the public-private issue, the arguments against public support of private higher education are found among traditional influences, particularly the separation of church and state policy. Arguments for the policy are advocated by those who wish to preserve the diversity of the American higher educational system by attacking the growing differences in tuition between the public and private sectors. It is not the intent of this study to recommend, or test, one viewpoint over another. However, private institutions will be included in the model design in order to preserve a more universal approach in the description of higher education at the state level.

Concept of Low Tuition

The state policy model is largely driven by the effects of enrollment and tuition on the costs of higher education. Therefore, the relevant literature analyzing these important variables and relationships is reviewed here.

The American postsecondary system over the past 25 years has been generally characterized as one in which the principle of low tuition, established to provide universal access to higher education, has been the guiding financial policy strategy. As strategies for accountability are designed, and institutions struggle with either real or potential declines, and as interest rates more strongly affected the economic environment, the low tuition system has come under close scrutiny. Rather than espouse a particular position relative to the retention of that system, a review of the relevant literature is offered.

As early as 1970, Howard Bowen had sensed and identified a growing threat to the low tuition system:

> Proposals are now being made to raise tuition drastically as one way of meeting increasing costs. This would be a tragic step at a time when efforts are being made to extend the benefits of higher education to millions who were previously excluded.[25]

Bowen suggests that a change from current national policy would negatively effect the low tuition idea. He asserted that a major shift in that policy would have drastic impact on the policy. Bowen, therefore, supported the idea that low tuition is a function of the belief that society is the prime beneficiary of higher education and should pay the brunt of the costs. Bowen, and others, believed that a policy with

the following principles should be developed:

1. Financing should veer toward the free public education model.

2. Student aid should be in the form of grants, and should be administered outside the institution.

3. Institutional support should come from a variety of sources and include substantial unrestricted income.

4. Private institutions should receive public funds to keep tuition down.[26]

Another vigorous supporter of the low tuition model is Allan Ostar. He wrote:

> The low tuition system . . . should not be abandoned on the basis of very limited data and even more limited assumptions. The rights of millions of college students to a low tuition education should not be bargained away in the name of some notion of 'higher educational consensus' or 'healthy dialogue.' Nor should this right be bargained away in the name of aid to low income students or in the name of student choice.[27]

Supporters of increased tuition have made a number of contentions, foremost among them are some of the following arguments: (1) the serious nature of financial distress upon institutions in both the public and, particularly, the private sector, and (2) the idea that low tuition has traditionally provided access to the lower classes is a myth. The real beneficiaries have been the middle and upper classes. This is termed, by anti-low tuition proponents, as a problem in distribution equity . . . the idea that while some of the lower class does benefit from the policy so do the middle and upper income classes that would probably attend college anyway.

In addition to those who either support or refute the notion of low tuition, a third group advocates another point of view. A number of individuals, groups and commissions, most notably the National Commission on the Financing of Postsecondary Education, have accepted the fact that, generally, a blanket low tuition policy has some built in inequity and that what is needed is modification, a modification that leads to the development of some alternative policies. Alan Rankin, for example, suggested if major changes are made at the federal level, particularly where tuition is concerned, that the government at least maintain its support of student aid programs. These programs, Rankin insists, also benefit private higher education and are, therefore, more effective than direct institutional aid.[28]

Similarly, in 1973, the Academy for Educational Development, Inc., contracted with the Council on Higher Education of the State of Washington to prepare an analysis with recommendations on the financing of postsecondary education in that state. The Academy had these recommendations for state level financial policy relative to low cost tuition and student aid:

> 1. There is general agreement that both society and students benefit from higher educational expenditures, but there is no known theoretical or practical basis for determining a particular cost/benefit ratio for society or for students.
>
> 2. In arriving at a distribution of costs between students and taxpayers, state governments are compelled to make practical judgments between cost needs and available income.
>
> 3. In some states, there have been proposals to alter substantially state pricing policy for public higher education by increasing the charges, with corresponding increases in student financial assistance.[29]

Other writers continued to develop alternative tuition pricing schemes. In 1974 Carbone's Alternative Tuition Systems was published by the American College Testing Program and sponsored by AASCU and NASU (American Association of State Colleges and Universities and National Association of State Universities and Land-Grant Colleges). In the document four notable analysts, Carol Van Alstyne, Joe Kauffman, Frank Pesci and Allan Vestal, desibed the implications of four alternative models to low cost tuition. Summarized, they were:

> Resident Student Fee Remission Model, in which the low tuition concept would be replaced by the idea of low net cost to residents. Tuition for all students, residents and non-residents would be set at full cost of instruction but graduates of in-state high schools would receive a tuition voucher that would have the effect of reducing direct costs considerably.
>
> Sliding Scale (Multiple Criteria) Model, in which a number of weighted residency criteria are used to sort students into nine tuition levels that correspond to arying degrees of resident/ nonresident status.
>
> Sliding Scale (Single Criterion) Model, in which a single criterion--length of domicile in the state--is used as a tool for sorting students into five tuition levels.
>
> National Trust Model, in which the states and the federal government provide educational subsidies for students who migrate to public institutions in other states, and go to an exchange bank which channels the subsidies directly to those institutions that enroll nonresident students.[30]

And, in 1977, Douglas McDonald wrote a monograph which reviewed alternative tuition systems that colleges, universities, states, and the Federal Government had implemented, or were in the process of implementing.[31] The document was primarily designed to inform students and their parents about what agencies were doing with alternative programs to help preserve the low tuition system in the United States. They reviewed a number of plans at the federal, regional and state level that

seemed to be aimed at preserving the low tuition system in basic form. Carbone's five models were mentioned in addition to state examples in California, New York, Pennsylvania, Wisconsin, Illinois, Indiana, Ohio and Washington. Regional plans developed by the Southern Regional Education Board (SREB) and the Western Interstate Commission on Education (WICHE) were reviewed together with cooperative exchange programs which had been developed by various states.

What the studies, documents, reports, monographs and articles seemed to impart was, yes, there are alternatives and options available for students to help finance their higher education experience beyond that of simple low cost tuition charges at state universities. Basically, however, public institutions still rely on a combination of policies that includes low tuition, student grants and loans, and other income sources to defray postsecondary education costs. What effect tuition costs have on enrollment is a key question for policy makers. A brief discussion and literature review on this important question follows:

Effects of Tuition on Enrollment

A number of studies have been written on the question. In the interest of brevity, two of the major and influential documents will summarize the central points. The reports, entitled, Tuition and Student Aid: Their Relation to College Enrollment Decisions, and Issues in Postsecondary Education Finance: Summaries of Six Issues. Report No. F78-2, did an excellent job of stating the results of available research. The first report reviewed the results of a seminar sponsored by the American Council on Education (1977), the second report is the

summary of six major issues regarding the subject and was edited by William Hyde for the Education Commission of the States.

The 1977 seminar helped to identify important findings including some of the following points:

> 1. For low income students, financial aid tends to narrow the tuition gap. Frequently the institution with the lowest tuition is not the institution with the lowest cost to the student, despite the common assumption that low tuition means low cost.
>
> 2. . . . because of their price discounting policies toward low-income students, and because a substantial amount of their price discounting comes from general revenues raised through tuition, independent institutions are raising the cost of education for all unaided students.
>
> 3. . . . people have a fairly good idea of what the net cost will be at the institution they actually attend. Perhaps the main reason why so many people apply to only one institution is that they have cost information only on that one institution.
>
> 4. . . . students and their parents have different perceptions about the pricing environment at different points in the educational sequence . . . based on the federal, state and institutional (in that order) financing options open to them.
>
> 5. Eighty-five percent of college selection attendance is statistically predictable in a linear framework using an individual's socioeconomic background, high school record, and college plans and aspirations.
>
> 6. The dominant pattern is for individuals to apply to one institution, to be accepted by that institution, and to attend that institution.[32]

Perhaps the most important information revealed by one of the participants, however, was that pricing (tuition and other costs) was small and negative compared with one's ability to obtain financial aid. That is, receiving a grant was more significant (statistically) in a student's selection of a particular institution.[33] Researchers also indicated that a student admitted to both high-cost and low-cost institutions, did not necessarily select the low-cost institution. Finally,

the research indicated that the best predictors of college attendance were not tuition costs, but the student's plans: his educational aspirations, and whether he chose to attend an academic or vocational institution.

William Hyde's article on the effect of tuition and financial aid on access and choice not only further summarized the major research on the relationship between tuition and enrollment, but also summarized the important concept of tuition elasticity.[34] Hyde defines the term this way:

> . . . the percentage change in enrollment divided by the percentage change in tuition. Using this measure, estimates from different studies can be compared, and, to give more meaning to the results, the tuition component of the elasticity is often converted to an absolute amount. A common practice is to relate a percentage change in enrollment to a $100 change in tuition.[35]

Development and acceptance of the tuition elasticity concept is an important step in being able to study and comment about the impact of tuition on enrollment. It helps researchers to make some quantifiable comment, based on reliable data, about the relationship. Hyde identified two other generalizations common to tuition elasticity:

> 1. The effect of a $100 decrease in price at public institutions is to increase public enrollment as a percentage of the 18- to 24-year-olds by about one percentage point.
>
> 2. The effect of a $100 price change in private institutions is to increase the private enrollment by about 1/2 a percentage point.

Hyde based his research on data contained in 10 studies from 1919 through 1972. Table I lists the studies, the type of study, the year and the price response coefficient associated with the particular study.

TABLE I

THE EFFECTS OF A CHANGE IN TUITION ON THE PUBLIC AND PRIVATE ENROLLMENT RATE: ALTERNATIVE ESTIMATES

Study	Type	Year	Price Response Coefficient*
Corazzini, Dugan, and Grabowski	National cross section	1963	0.62
Hopkins	State cross section	1963	0.75
Barnes	Individual students	1970	1.53
Radner and Miller	Individual students	1966	0.05
Kohn, Manski, and Mundel	Individual students	1966	0.92
Hoenack	High schools districts	1965	0.71
Hoenack and Weiler	Individual students	1972	1.46
Spies	Individual students	1971	0.05
Campbell and Siegel	Time series	1919-64	0.20
Bishop	Individual students	1963	0.90

*Increase in enrollment rate of eighteen- to twenty-four-year olds (in percentage points) per $100 decrease in tuition, in 1974 dollars.

Sources: Derived from the studies given in the first column, all of which are cited in the text (see index). Details of the calculations underlying the price response coefficients, shown in the last column, are available from the author. The calculations require correcting price response coefficients from various studies for price change since base year and for differences in enrollment base.

From Table 9 of Michael S. McPherson's "The Demand for Private Higher Education." In Public Policy and Private Higher Education edited by David G. Breneman, Chester E. Finn, and Susan C. Nelson, Washington, D.C.: The Brookings Institution, 1978, in press.

While Hyde has generally defined tuition elasticity in terms of x percent decrease or increase in enrollment relative to a $100 increase or decrease in tuition, other researchers have more specifically

measured the relationship between tuition and enrollment. The state model in this study used tuition elasticity figures from a study by Thomas Hopkins. Table II gives the tuition elasticities of demand in the public and private sectors and were based on a state cross-section study.[36]

TABLE II

TUITION ELASTICITIES OF DEMAND

Percent of Increase in Tuition	Percent of Change in Enrollment	Tuition Elasticity of Demand
33.3 (Public)	-2.2 Public	-.066
33.3 (Public)	+1.0 Private	+.030
33.3 (Public)	-1.2 Total	-.036
19.0 (Private)	+1.0 Public	+.053
19.0 (Private)	-2.2 Private	-.116
19.0 (Private)	-1.1 Total	-.058

Tuition elasticity has evolved from the commonly accepted concepts of price elasticity developed by economists. Elasticity itself may be defined as:

> . . . the responsiveness of the quantity of a product that consumers are willing to take to changes in its price, given the demand curve for the product. If quantity taken is quite responsive to price changes, a decrease in price may increase the total amoung of money spent on the commodity. If quantity taken is not responsive to price changes, a decrease in price may decrease total expenditures on the commodity.[37]

More simply, elasticity of demand measures the responsiveness of

quantity taken of a commodity to changes in price. It is defined as the percentage change in quantity divided by the percentage change in price when the price change is small. The relationship may be algebraically expressed as:

$$E = \frac{\triangle x/x}{\triangle P/P}$$

In addition, economists have generally and traditionally accepted other key points regarding elasticity of demand. First, there are definitions including elasticity, unitary elasticity, and inelasticity. Demand is said to be elastic when elasticity is greater than one. When elasticity equals one, there is unitary elasticity, and when elasticity is less than one, it is inelastic.[38] Second, and very important for the state model study, researchers have identified four significant factors which influence elasticity. These are:

1. The availability of good substitutes for the commodity under consideration.
2. The number of uses to which the commodity can be put.
3. The price of the commodity relative to consumer's incomes.
4. Whether the price established is toward the upper end of the demand curve or toward the lower end of the curve.

Economists have also determined through research that the most important of the four factors is the availability of substitutes. For example, if good substitutes are available, demand for a particular commodity will tend to be more elastic.[39] This is important information for the state model and for decision makers who are determining tuition policy at either the state level where public institutions are concerned, or in

the private sector institutions. Changes in tuition definitely affect changes in enrollment in a cross-elastic way: public-private and private-public. Certainly, where drastic changes in tuition policy are contemplated, subsequent shifts in enrollment will occur, particularly if substitutes are available, as they are in higher education, although this will vary from state to state. In Oklahoma there is enough diversity to make a judgment that price elasticity of demand is a significant economic factor which policy makers should consider.

Finally, Hopkins determined that,

> An increase in public tuition appears to cause some eligibles to switch into private higher education, and some to avoid college altogether. . . . An increase in private tuition similarly seems to cause some to switch into public higher education, and some to avoid college altogether.[40]

Simulation Model Development and Use

Having reviewed the major influences on financial policy study, the effects of tuition on enrollment, the concept of low tuition, and the major issues, a discussion of simulation model development and use is presented. Over the past fifteen years, a number of techniques have been developed to assist policy makers in arriving at better ways to formulate financial policy. The overwhelming majority of these techniques have been pioneered by large, well-financed research organizations, for example, the National Commission of the Financing of Postsecondary Education or the Rand Corporation. As a result of the high cost of research, application of the simulation model techniques have been limited. In addition, because state coordinating agencies and institituions have largely utilized some form of program budgeting in the

allocation of resouces, financial planning using simulation modeling has not been widespread.

It is difficult to trace directly the development of financial policy simulation models. For the most part, existing examples have been developed with a national, as opposed to state emphasis. However, one may trace the development of a few projects and studies which seem to give some historical meaning to the development of simulation modeling. In 1975, Bishop developed a model that estimated an example of college attendance which focused on the influences of public policy and economic development.[41] Bishop was concerned with the relation between the price of tuition and socio-economic background in molding a student's choice about which institution to attend. His study examined variables such as tuition, admissions requirements, college location, breadth of curriculum, draft deferments, and class integration of neighborhoods as one item. He then tried to correlate certain economic aspects including the opportunity cost of the student's study time and the size of the anticipated earnings payoff to college graduates. He found that his model worked well in helping to determine the effects of tuition on a student's choice of which particular institution to attend. The study showed that if in 1961, ". . . full cost tuition ($1,100) had prevailed in all colleges without compensating increases in grant aid, these equations predict that the college entrance rate would have been about 17 percent rather than 40 percent."[42] The model was also successful in predicting the effects on students from different economic backgrounds and different abilities relative to access.[43]

In another study, Weathersby developed a mathematical model for use in determining student tuition charges at public and private

institutions.[44] In the study, Weathersby defined higher education as an economic commodity, with the price to the consumer (tuition) as an algebraic function of supply, demand, and quality. The model provided one set of solutions to such problems as how could one better define the optimum size and the pricing policy of private institutions, the pricing policies associated with various public objectives, and the extent to which the public sector should subsidize higher education. Weathersby tried to design the model to provide a framework for creation of a rational pricing policy of higher education. The model did not offer definitive answers to questions concerning the type of policy to be implemented, but did provide a framework for the creation of a rational pricing policy for higher education.

Working for the RAND Corporation, Carroll and Relles developed a set of methods for modeling students' choice among higher education institutions.[45] Using Bayes' Theorem of Linear Regression, Carroll and Relles tried to predict the distribution of students among certain homogeneous categories of institutions. They found that the deviations between predicted and actual distributions were small and that the predictive power of the model was substantially greater than the conditional logit technique, or with any other models.

Another model was developed by Western Interstate Commission on Higher Education and NCHEMS. In 1977 the State Planning System Model (SPS) was designed as a policy-oriented management tool to analyze the interrelated effects of alternative policies and their relationships to state goals.[46] The model was pilot-tested in Colorado and New York to evaluate the applicability of large scale quantitative models to general

postsecondary education policy-making situations. It was specifically designed by Huckfeldt, Chisholm, Cherin, and Bassett. With the SPS model,

> . . . the user selects and describes the issue to be addressed, designs the analytical framework that will yield the desired results, selects the variables, assigns values to each and provides the data . . .
>
> The SPS is not a specific model or analytical construct . . . it becomes a 'model' once the user selects the design that will best address the problem or opportunity to be analyzed . . . the SPS places no a priori requirements on the particular design.[47]

The developers found that the model had the ability to display the "impact of tuition options on residents and nonresidents, graduate and undergraduate, and part-time and full-time students; to show how the impact shifts as the policy alternatives change; and to show the revenue consequence of each option."[48]

The SPS model, although it did a good job of addressing state financial planning, was not the most important influence on the model constructed for this study. The state simulation model in this study was influenced primarily by the model which was designed by the National Commission on the Financing of Postsecondary Education and contained in the document, Financing Postsecondary Education in the United States. That document, and a computer program which was developed for the Kansas City Regional Council for Higher Education, in cooperation with the Midwest Research Council, were used in the development of the state policy model in this study.[49]

The NCFPE Model

Purpose

Following the deluge of activity in higher education in the later 1960's and early 1970's, including the dramatic increases in enrollments and accompanying federal legislation, not to mention increases in student aid (BEOG grants), the 92nd Congress (1972) was interested in the ". . . establishment of new planning structures at the state level to improve all forms of statewide planning for postsecondary educational systems."[50] Within the series of historically significant acts passed by the Congress that year, was a provision that established a National Commission on the Financing of Postsecondary Education. The Commission was charged with developing an ". . . analytical framework to be used to review existing financing programs and to recommend new financing methods and policies that would most effectively serve the national interest."[51]

Within this general charge, the Commission was asked to specifically address other topics including: (1) to study past, present, and anticipated private, local, state and federal support for postsecondary education, (2) study the appropriate role for the states in support of higher education, (3) study alternative student assistance programs, (4) study the potential federal, state, and private participation in such programs, (5) analyze existing federal aid to institutions and other possible alternatives, and (6) assess the nature of financial distress within institutions across the country and possible alternative solutions to the problems.[52]

The Commission's primary responsibility was not to:

> . . . recommend a specific set of financing programs to the President and Congress but rather to develo and submit a comprehensive and systematic method for choosing among the many alternatives before Congress and the state legislatures for the financing of postsecondary education. In this way, the Commission's study has been unique among such studies at the national level, and to a great extent its contribution will only be determined by the ability and willingness of the federal, state governments, and other interested policy makers to make effective use of this proposed system for analysis.[53]

The state model in this study was concerned most with Chapter 6 of the NCFPE report in which the analytical framework was described and used. Before reviewing the key variables and their interrelationships, the philosophy with which the Commission established and used in construction of the framework deserves some attention. The Commission believed that because of the complexity and quantity of data that was available to policy makers, an attempt should be made to construct a new way of looking at financial policy making in terms of the approach one used to compile and use existing data. In the words of the Commission:

> It is axiomatic that public policy must often depend on the basis of imperfect knowledge. No major policy decisions would be possible if they were to be made only with a perfect understanding of all the consequences for all parties affected . . . Rather than concentrating its efforts upon developing a specific set of financing recommendations for Congress, the President, and the states, it has devoted a large part of its energies to developing a framework for analyzing policy for the financing of postsecondary education. Such a framework can be useful for considering and developing specific proposals for changing current financing patterns.[54]

The Commission developed a number of elements which were used to construct the analytical framework. Specifically, the Commission

derived these elements from 10 questions that were used in the construct. The questions addressed themselves to such issues as what criteria should be used to measure the achievement of objectives; what financing mechanisms most effectively serve the general policies; and, what were the important interrelationships between changes in financing and the responses of students, institutions, and finance sources?[55] From the questions, the Commission designed an analytical model, which was one of the ten elements in the framework, to help determine answers to the questions posed within the framework. This process enabled the Commission to quantify data into a workable set of data which could respond to the questions the Commission asked, or anyone else could ask.

The analytical model was a ". . . mathematical construct predicated upon specified assumptions about the nature of interrelationships between and among changes in financing and responses of students, institutions, and sources of financing."[56] The interrelatedness idea is important both for the Commission's report and for understanding the state model. The analytical framework and model makes the assumption that any financial policy is guided not by a single factor, but a series of interrelated factors.

How the data react and interrelate will be described more fully in the chapter on design and methodology. They are presented here to identify the manner in which the information was structured and to establish the concept of variables and their interrelatedness.

Insofar as this study has reviewed much of the Commission's data relative to financial policy earlier, this section will focus on the Commission's comments regarding the analytical framework and its potential usefulness.

Regarding the framework, the Commission concluded that a "comprehensive analytical framework would be useful in developing financing proposals that will accomplish the objectives they seek."[57] The Commission recommended that ". . . federal, state, and other policy makers . . . use an analytical framework similar to that described [in the report]."[58]

Regarding the analytical model, the Commission concluded that the national financial policy model provided ". . . an instrument that can significantly improve the capacity of policy makers to make decisions about the financing of postsecondary education."[59] Despite some limitations, the Commission recommended that further research and development of models similar to that of the Commission's be developed and assessed.

The Commission's staff researched a total of eight alternative finance plans, although as many as fifty were originally considered. Each plan was described according to its general policies, financing mechanisms, and, where possible, financing programs. Evaluation of the plans focused on the effectiveness of each plan in achieving the stated national objectives of student access, choice, opportunity and shared responsibility as previously outlined by the Commission. A short summary of the plans follows:

> Plan A - proposed a major shift in the responsibility for financing postsecondary education from public and private sources to students and parents. A total financing level of $45.3 billion was recommended by 1980. Public financing was to be reduced by $5 billion during the period 1972-80.
>
> Plan B - proposed a substantial reduction in current institutional aid and a corresponding increase in student aid. It recommended a financing level in 1980 of $48.4 billion, reducing public financing by $2.3 billion.
>
> Plan C - proposed a shift in the relative proportion of student

aid to institutional aid by providing proportionately greater increases in student aid than institution aid. Total financing level was recommended at $54.4 billion with public financing being increased by $3.5 billion by 1980.

Plan D - proposed a shift in the relative proportion of student aid to institutional aid, with a substantial increase of financial aid to students, particularly to students attending private institutions. Total financing level was recommended at $53.5 billion; public funding would be increased by $2.3 billion.

Plan E - proposed to hold lower-division tuition in public institutions stable (with adjustment for inflation only) while substantially increasing aid to private institutions to enable them to improve their competitive position relative to public institutions. Recommended financing level for 1980 was $52.9 billion, and public financing would be increased by $1.9 billion.

Plan F - proposed to shift responsibility for financing post-secondary education at the lower division from students and parents to public sources and to increase aid to institutions while reducing aid to students. Recommended funding level was $51 billion by 1980 with an increase in public funding of $440 million.

Plan G - proposed a shift in the relative proportion of student aid to institutional aid by providing increased aid to collegiate instsitutions while holding student aid constant. Recommended funding level was $51.3 billion by 1980. PUblic financing would be increased by $87 million.

Plan H - proposed a shift in the relative proportion of student aid to total public aid by increasing both student aid and istitutional aid, but by increasing student aid relatively more than institutional aid. Recommended funding level was $55.1 billion by 1980 with increased public funding of $4 billion.[60]

The Commission also evaluated a series of alternative financing mechanisms including tax credits, vouchers, and income contingent loans. From the analysis, the Commission arrived at five generalizations regarding the analysis procedure:

1. At any given level of financing, targeted student assistance plans (such as grants to needy students) are more effective for improving student access than general student assistance (such as tuition reduction).

2. Increases in the effective price (tuition minus student aid of postsecondary education--the price the student must pay--result in decreases in enrollment; conversely, decreases in the effective price result in increases in enrollment.

3. Increased spending for student grants, if the extrapolated 1972 patterns of financing and enrollment continue, would result in proportionately larger increases in enrollments in the private collegiate and noncollegiate institutions than in the public sector, and enrollments in the public two-year colleges would not grow as much as would otherwise be expected.

4. If the income eligibility ceiling for student grants were changed from $15,000 to a lower level, the enrollment of students in the $10-$15,000 range would decrease slightly while the enrollments of students in the under $10,000 family income group would increase.

5. Expanding student access to postsecondary education through increased student grant financing would require institutions to seek supplemental financial assistance to meet additional costs induced by the enrollment growth.[61]

The Commission concluded that:

. . . an analytical framework . . . provides an instrument that can significantly improve the capacity of policy makers to make decisions about the financing of postsecondary education.

However, such frameworks are difficult to develop, as demonstrated by the limitations of the analytical model, one element of the framework.[62]

Summary

In summary, the literature review chapter has attempted to focus on the major studies, reports, articles and ideas that had some influence on the development of the state policy financial simulation model.

The literature was divided into a workable framework. First, a listing of those documents which brought attention to higher education finance were described. These works set the tone for the study of higher education financial policy by surveying the existing environment, and

made no attempt to develop alternative policy analysis methods. Second, a handful of blue-ribbon committees was responsible for five reports which were influential in identifying some of the principal issues in higher education financial policy analysis, particularly with reference to such issues as access and choice. Among the five groups was the National Commission on the Financing of Postsecondary Education. The Commission's report had a strong influence on the development of the state policy model. Third, a series of studies and reports was reviewed which attempted to either make statements about, or actually measure and quantify, major issue questions. Fourth, a series of reports on the effects of tuition and student aid (two important variables used in the state policy model) were reviewed. Fifth, a discussion of the development of model simulation techniques was reviewed. In this section, the two most influential studies for the development of the state policy model were identified. They included the State Planning System Model (SPS) developed by the Western Interstate Commission on Higher Ecuation (WICHE) and the model developed by the National Commission on the Financing of Postsecondary Education. The SPS model did perform as expected and was successful in being able to show the effects of the changes in variables, specifically changes in tuition and enrollment. The NCFPE model was also successful in establishing the use of a mathematical analytical framework to evaluate the effects of changes in policy on student access and institutional costs. And, sixth, the chapter detailed the NCFPE model which exerted the greatest, direct influence on the state policy model.

Having reviewed some of the major influences and issues which helped shape the development of the state policy model, a discussion of the model's design and methodology follows.

ENDNOTES

[1]Milton Friedman, Free to Choose (New York, 1980), p. 165.

[2]Western Interstate Commission for Higher Education, State Planning System. Case Studies (Boulder, Colorado, 1977), 74 pages.

[3]Education Commission of the States, The States and Private Higher Education, Vols. I-VII (Denver, Colorado, 1973-1979).

[4]Definitions for access, choice and equity: Access: is the idea that every student should be able to enroll in some form of postsecondary education appropriate to that person's needs, capability, and motivation. Choice: is the idea that every student should have a reasonable choice among those institutions for postsecondary education that have accepted him for admission. Equity: is the idea that every student, regardless of socio-economic background, be afforded similar higher education opportunities as students from wealthier backgrounds.

[5]John C. Honey, "Higher Education's Great Opportunity," Governmental Relations (Washington, D.C., 1979), p. 327.

[6]John Millett, Financing Higher Education in the United States (New York, 1952).

[7]Lyman A. Glenny and James R. Kidder, Trends in State Funding in Higher Education: A Preliminary Report (Denver, Colorado, 1973), 17 pages.

[8]Committee for Economic Development, The Management and Financing of Colleges (New York, 1973).

[9]Special Task Force to the Secretary of Health, Education and Welfare, The Second Newman Report: National Policy and Higher Education (Cambridge, Mass., 1973).

[10]National Commission on the Financing of Postsecondary Education, Financing Postsecondary Education in the United States (Washington, 1973), 442 pages.

[11]Carnegie Commission on Higher Education, Higher Education: Who Pays? Who Benefits? Who Should Pay? (New York, 1973).

[12]Ibid.

[13]Millett.

[14]Ibid.

[15]A. E. Dick Howard, State Aid to Private Higher Education (Charlottesville, North Carolina, 1977), p. 4.

[16]Paul R. Couey, "A Preliminary Investigation of the Effects of State Financial Policy on the Independent Sector of Higher Education" (Unpublished paper presented at the 6th Annual National Conference on Higher Education Finance and Management, Tempe, Arizona, 1980).

[17]Ibid., p. 3

[18]Western Interstate Commission for Higher Education.

[19]Mack C. Adams. Personal Interview. Austin, Texas, March, 1981.

[20]John I. Kirkpatrick, "Financing Higher Education: The Role of the State," College Board Review (Spring 1971), pp. 22-25.

[21]Robert O. Berdahl, Statewide Coordination of Higher Education (Washington, 1971), p. 352.

[22]Education Commission of the States.

[23]Ibid., p. 3.

[24]David Breneman and Chester Finn, Jr., Public Policy and Private Higher Education (Washington, 1978), p. 31.

[25]Howard R. Bowen, Finance and the Aims of American Higher Education (Washington, 1970), p. 1.

[26]Ibid., pp. 10-12.

[27]Allan W. Ostar, "Financing of State Colleges and Universities" (Unpublished paper presented at the National Conference on Postsecondary Education, Washington, January 1975).

[28]Alan C. Rankin, "Alternative Tuition Pricing Arrangements" (Speech before the National Association of College and University Business Officers, Boston, Mass., July 1974).

[29]Academy for Educational Development, Inc., Alternatives in State Government Financing of Higher Education (Washington, 1973), 45 pages.

[30]Robert F. Carbone, Alternative Tuition Systems (Iowa City, Iowa, 1974), pp. X-XI.

[31]Douglas S. MacDonald, Alternative Tuition Systems, Report No. 6 (Washington, 1977), 39 pages.

[32]Thomas Corwin and Laura Kent, eds., Tuition and Student Aid, Their Relation to College Enrollment Decisions (Washington, 1978), pp. 3-8.

[33]Ibid.

[34]William C. Hyde, Issues in Postsecndary Education Finance: Summaries of Six Issues. Report No. F78-2. (Denver, Colorado, 1978), p. 29.

[35]Ibid, p. 36.

[36]Thomas Hopkins, "Higher Education Enrollment Demand," Economic Inquiry (1963), pp. 53-65.

[37]Ibid.

[38]Ibid., p. 45-46.

[39]Ibid., p. 46.

[40]Ibid. p. 60.

[41]John Bishop, "Income, Ability, and the Demand for Higher Education." Discussion Paper No. 293-75 (Madison, Wisconsin, 1975), 42 pages.

[42]Ibid.

[43]Ibid.

[44]George Weathersby, "Student Tuition Models in Private and Public Higher Education (Paper presented at Operations Research Society of America National Meeting, Detroit, Mich., 1970), 27 pages.

[45]Stephen J. Carroll and Daniel A. Reilles, A Bayesian Model of Choice Among Higher Education Institutions (Santa Monica, California, 1976), 41 pages.

[46]Statewide Measures Inventory. Technical Report 68 (Boulder, Colorado, 1975), 76 pages.

[47]Ibid.

[48]Ibid.

[49]Midwest Research Institute, A Computer Simulation Modeling Tool to Assist Colleges in Long-Range Planning (Kansas City, Missouri, 1969).

[50]Western Interstate Commission for Higher Education.

[51]Ibid.

[52]Ibid., pp. 5-6.

[53]Ibid., p. 7.

[54]Ibid., pp. 8-9.

[55]Ibid., p. 230.

[56]Ibid., p. 231.

[57]Ibid., p. 247.

[58]Ibid., p. 362.

[59]Ibid.

[60]Ibid., p. 363.

[61]Ibid., p. 365.

[62]Ibid., p. 367.

CHAPTER III

MODEL DESIGN AND METHODOLOGY

Included in this chapter is information relative to the state model's design and methodology. The chapter will review a description of the model, including the purpose, data sources, identified variables, and the assumptions and relationships upon which the model is constructed. The design and methodology section is precluded by a brief review of the Oklahoma higher education financial structure.

Description of the Oklahoma Model

Purpose

As reviewed in the literature, the SPS model and NCFPE model were major influences on the development of the state model. Both of the earlier models have some common characteristics with the state model:

1. Predetermined variables, usually tuition, enrollment and costs.
2. Computer-designed and assisted information flow, based on a mathematical construct.
3. A purpose, which is to assess the usefulness of the model in reviewing and evaluating alternative financial policies.

In general, all three models were designed primarily with the objective to evaluate the ". . . potential of large-scale quantitative models in the . . . planning process and to enable . . . others to evaluate

policies, make decisions, and allocate resources more effectively."[1] The purpose, therefore, of the state policy model is similar to the purposes of the SPS and NCFPE models.

Another common element in the model's design referred to the idea of interrelated variables. Many researchers have studied in depth the issues and problems associated with areas such as student aid, enrollment levels, tuition levels, student costs, and state and institutional costs. The SPS, NCFPE and state policy models were developed to analyze the interdependence of the variables. As one of the studies so appropriately stated: "This is an extremely important feature since it does begin to reflect the complexity of the actual environment facing postsecondary planners and policy makers."[2]

Finally, the ultimate purpose was the assessment of the ability of a model to provide useful information to assist policy makers to determine the answers to crucial questions. Generally, the policies under consideration related to costs (institutional, governmental, or student-related). The concept of analyzing a higher education system on the basis of the interrelatedness of a set of predetermined variables is central to the development of the state policy model. To better describe the state model, a flow chart is provided in Figure 1 on page 51.

The Oklahoma Model is an accounting system which assists policy makers to analyze and compare the costs of higher education. Initially enrollment, tuition and institutional revenues are projected from a base year over a five year period. Then, alternative financial policies are applied and compared with the initial base year for differences in costs. The Oklahoma Model is assumed to be revenue driven. That is, Costs are derived from Revenues. For example, cost to the Family is

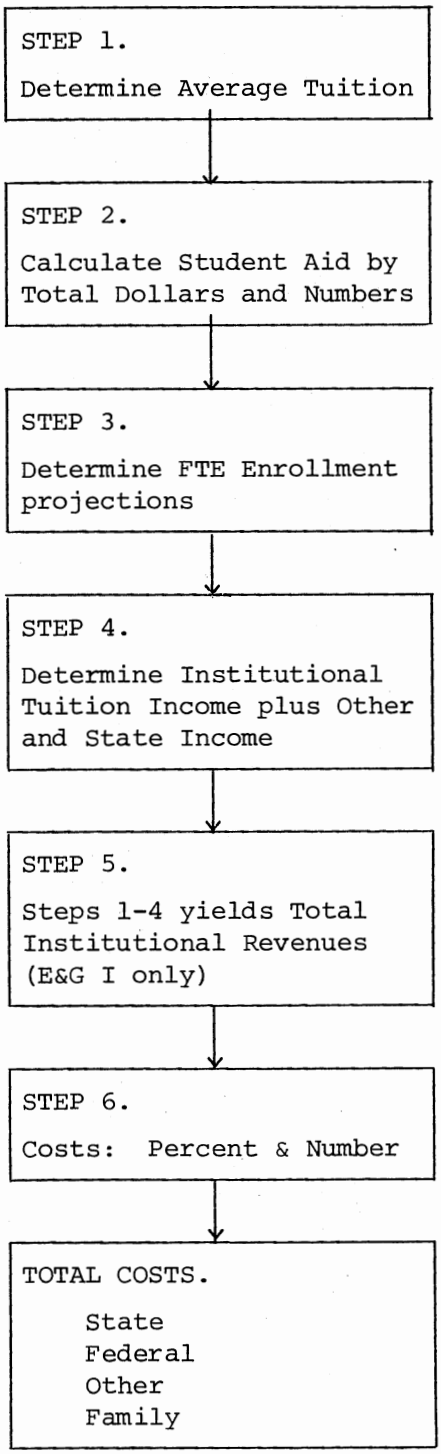

Figure 1. State Model Flow Chart

represented by average tuition. Similarly, cost to the state are represented by the state appropriated funds, E&G I only, not E&G II, plus state student aid.

E&G I funds under the Oklahoma State System of Higher Education budgeting systems includes the following areas:

General Administration

General Expense

Instruction

Organized Activities

Organized Research

Extension and Public Service

Libraries

Physical Plant

Data Processing

E&G II funds in Oklahoma represent auxiliary enterprises, student aid and sponsored research. Auxiliary enterprises represent income from Housing food services, Intercollegiate athletics, Student Union, Bookstore, Health Service, and Student activities. The Oklahoma Model does not concern itself with E&G II. Also, it should be noted that Private institution budgets, while generally similar to the state system budget, is not exactly the same.

The Oklahoma Model includes the follow variables. The variables are defined and their origin is listed.

Oklahoma Model Variables

Higher Education Sector refers to whether a school is public or

private.

Institutional Type refers to whether the school is a 2-year college, a 4-year senior college or university, or is a major university which grants graduate degrees at the doctoral level exclusive of a professional school, e.g., Law School.

Resident Student is one who resides in Oklahoma and who pays a lower tuition rate than an out of state student.

Non-Resident Student resides outside the state of Oklahoma and pays a higher tuition rate than in-state students.

Tuition is the average amount of money charged to the student to attend either a public or private institution. For the Oklahoma Model, the figure is an average rate calculated by institutional type and residency for public sector schools and by institutional type for private institutions. Private institutions charge the same tuition rates for in-state and out-state students. In addition, tuition rates were established for undergraduate and graduate levels. Data for Tuition was compiled from records in the Oklahoma State Regents for Higher Education office where public institutions are concerned. Private tuition rates were established by soliciting the information institution by institution by institution over the phone.

Student Aid is defined as the dollar assistance a student receives to help he or she pay for the costs of attending a college or university. Where student aid is concerned, it is difficult to pinpoint exactly the type of assistance a student receives. However, for purposes of the Oklahoma Model, the following categories were derived: Grants included awards from BEOG, SEOG, Vocational Rehabilitation, State and Local, private sources, Institutional, Tuition Waivers, and Other.

Loans included NDSL, Federal insured, State insured, Institutional, Private Sources, and Other Types. Student Aid data for public sector institutions was supplied by the Oklahoma State Regents for Higher Education. It was included on a document related to progress or desegregation pursuant to Title VI of the Civil Rights Act of 1964 and Title IX of the Education Amendments of 1972 called Financial Assistance to Students in Institutions of Higher Education. Data for the private sector institutions was derived by, again, polling the institutions through the Director of Finacial Aids. The same categories were identified for the private sector student aid areas as were the public sector schools.

The information was then categorized for analysis in the following manner:

Grants

Total Number Public
Total Number Private

State, Federal, and Other by Public and Private

Total Dollars Public
Total Dollars Private

Loans

Total Number Public
Total Number Private

State, Federal, and Other by Public and Private

Total Dollars Public
Total Dollars Private

Calculations were then added which yielded Total Student Aid figures for both the public and private sector institutions. Calculations were also made to determine the amount of aid per student by dividing the total

amount of aid by institutional type by the number of student aid grants. For example, the amount-per-student in Grants in 2-year, public institutions the initial year was calculated to be $445 per student. Or,

$$\frac{\$9,014,000}{20,257} = \frac{\text{(Total Public 2-Year Dollars)}}{\text{(Total Number of Grants)}} = \$445$$

FTE Enrollment is Full Time Equivalency and is the total number of semester hours divided by the number 30 at the undergraduate level, and 24 at the graduate level. The sum of the two numbers is the FTE. It is the formula used for calculating FTE by the Oklahoma State Regents for Higher Education. FTE is distinguished from Headcount in which the total number of students is counted including full-time, part-time, and special students. Further, FTE Enrollment for public and private sector institutions was calculated by institutional type, level and residency. In this case, level refers to graduate and undergraduate students.

Projections were based on a combination of State Regents' data and interpolations based on an average-year-to-year increase or decrease. That is, the Oklahoma State Regents for Higher Education provided projections to 1985 based on FTE data. They did not provide information, or projections, based on FTE projections by institutional type and level. Consequently, the Regents' FTE projections were combined with the average increase or decrease in FTE enrollment from the period 1978-1983 to determine the average increase or decrease in enrollment (FTE) between institutional types for that period. The results generally showed a small decline in public FTE enrollment and a slight decrease in private FTE enrollment. The private FTE enrollment was based on an average increase or decrease per year over a period from 1972 to 1982. The averages resulted in the following:

2-year colleges = -4.25%

4-year colleges and universities = +1.13%

universities = +1.08%

These average percentages were then projected over a five-year period. Thus, the private 4-year and universities showed a slight increase, while the 2-year colleges showed a drop of -4.25% in FTE enrollment per year.

Tuition Income is defined as the amount of funds generated by the average amount of tuition by institutional type and sector times the FTE enrollment of the corresponding institutional type and sector. This is expressed as average tuition rate times the FTE enrollment of a particular institutional type.

Other E&G Income is defined as income identified by the public and private sector institutions as "other". The data was gathered from the Oklahoma State Regents for Higher Education for the public institutions and from the private institutions.

State E&G Subsidy is defined as the amount of state appropriated funds dispersed to the public institutions. In the case of private institutions, the Alternative #2 funds were dispersed to students and no appropriation was directly tied to a state appropriation, i.e., a cost.

Institutional Revenues are defined by adding the costs of tuition, other, and state. In the final analysis, the total public and private revenues are listed accordingly. These are derived figures.

Finally, the projected Costs by Source are determined by the following calculations:

State = E&G I Subsidy + State Student Aid

Federal = Amount of Federal Student Aid

Other = Amount of Other Student Aid + Total Other Income

Family = Amount of Tuition Income

Total Costs = State + Federal + Other + Family

The model begins the analysis process by using enrollment projections for full-time equivalent (FTE) students provided by the state regents office. Some interpretation of the regents' data is needed because the latest information provided statistics from 1978-83. Consequently, an average percent of change over the six-year period was calculated for each of the major types of institutions (2-year college, 4-year college and 4-year university) by sector and level (undergraduate lower division, undergraduate upper division). Once the FTE enrollment projections were completed, determination of data were derived for the following variables:

1. Projected average tuition and fee charges for both resident and non-residents.
2. Projected number of FTE students on student aid and the average amount of student aid per FTE.
3. Average E&G Costs per FTE.
4. State Institutional Aid (E&G I only).
5. Total Cost projections by source (State, Federal, Other, and Family).
6. Enter the changes in Tuition and calculate new enrollment projections leading to changes in costs.
7. Calculate increases or decreases in cost resulting from enrollment changes.

8. Evaluate the effects of financial pollicy on enrollments, costs and contributions by source.

The Oklahoma Model may be further explained by operationalizing the model's taxonomy with the following formulas.

Total Costs = Total Revenue, or, TC = TR

E = Enrollment (FTE)

$\frac{TC}{E}$ = FTE Cost Per Student

Total Tuition = Average Tuition Rate x E

Total Revenues = Tuition (Family) + State Appropriation + Federal + Other

Again, what the Oklahoma Model does is to provide a system of analyzing costs of higher education in terms of revenue. To further explain the model, an example is included which demonstrates how Total Public Tuition Income was derived. Using the data from the initial forecast, average tuition rates were established by level (undergraduate and graduate) and institutional type (2-year, 4-year, university). Using enrollment projections from the Oklahoma State Regents' office, FTE enrollment projections were made over a five-year period. The FTE Enrollment projections, as derived from the process explained on pages 55-56, were entered and were multiplied by the average tuition rate for the corresponding type. For example, the average tuition rate for 4-year, resident students in the initial year was $486. The number of students was 28,357. Total amount of tuition income produced by the 4-year, resident student in Oklahoma for the initial year was:

28,357 x $486 = $13,781,502

The institutional tuition revenues were added together to produce total public tuition income of $66,274,000 in the initial year.

Data Sources

The data which were used in the state policy model were derived from both the public and the private sectors of higher education in Oklahoma. The research effort was instrumental in determining that data from the public sector were more available and easier to extract than was data from the private sector.

The primary source for all public, and some private, sector data was the Chancellor's Office in the Oklahoma State Regents' office. A brief summary of the documents used includes the following:

Enrollments in Oklahoma Higher Education

Operating Budget Needs of the Oklahoma State System of Higher Education

Student Fees

A Comparison of Student Costs in Public Institutions of Higher Education in Ten Mid-Western States

Current Operating Income and Expenditures (at) Oklahoma State Colleges and Universities

Oklahoma Higher Education, Planning for the '80's

Program Budgeting, 1982-83

Estimates of Needs of E&G Budgets for FY 1981-82

In addition, some information was untitled. Data regarding tuition charges and student financial aid were the two primary areas where information was not contained in a specific document.

Data were also received for the private sector from the office of the Oklahoma Association of Independent Colleges and Universities, also located in Oklahoma City. Student aid data from the private sector was

supplied by individual institution, then aggregated into the model.

The data covered the following institutions:

Public

4-year Doctoral Universities

Oklahoma University
Oklahoma State University

4-year Colleges and Universities

Central State University
East Central State
Northeastern Oklahoma State University
Northwestern Oklahoma State University
Southeastern Oklahoma State University
Southwestern Oklahoma State Unversity
Cameron University
Langston University
Oklahoma Panhandle State University
Connors State College
Northeastern Oklahoma A&M College
Northern Oklahoma College
Western Oklahoma State College

2-year Colleges

Carl Albert Junior College
Claremore Junior College
El Reno Junior College
Oscar Rose Junior College
Sayre Junior College
Seminole Junior College
South Oklahoma City Junior College
Tulsa Junior College

Private

4-year Colleges and Universities

Bartlesville Wesleyan College
Bethany Nazarene College
Flaming Rainbow
Hillsdale Freewill Baptist College
Midwest Christian College
Oklahoma Baptist University
Oklahoma Christian College
Oklahoma City University
Oklahoma Missionary Baptist College
Oral Roberts University
Phillips University
Southwestern College

2-year Colleges

Bacone College
St. Gregory's College

Variables

The key variables include:

1. Average Tuition Rate
2. Student Aid
3. FTE Enrollment
4. Tuition Income (Institutional)
5. E&G Income

Once the data were entered into the computer, the data array included a base year figure and projections for five years. Figure 2 on page 62 describes the way in which the data were portrayed.

Assumptions and Relationships

The key assumption in the Oklahoma Model is that costs are directly related to revenue. Revenue is generated by multiplying the average amount of tuition times the number of FTE enrolled students. Costs, therefore, are revenue driven. Student Aid, although another key element of the model, is indirectly associated with costs under the assumption that the more student aid is available to students in either the public or private sector, the more enrollment will either increase or decrease accordingly. The Oklahoma Model uses the Hopkins tuition elasticity coefficients to express the relative effect of decreases or increases within the public or private sector and between the two sectors (cross elasticity of demand).

ALTRNTIVE FRCST - 3

LINE	CH	PLANNING ITEM	BASE	CODE	METHOD OF COMPUTATION			TOTALS
1	0	AVERAGE TUITION-UNDERGRAD						
2	0	PUBLIC 2-YR RESIDENT	323.0	2	INCREASE	0.0	%/YR	ADD INTO 0
		BASE 1	2			3	4	5
		323.00 323.00	323.00			323.00	323.00	323.00
3	0	PUBLIC 2-YR NON RESIDENT	855.0	2	INCREASE	0.0	%/YR	ADD INTO 0
		BASE 1	2			3	4	5
		855.00 855.00	855.00			855.00	855.00	855.00
4	0	PUBLIC 4-YR RESIDENT	486.0	2	INCREASE	0.0	%/YR	ADD INTO 0
		BASE 1	2			3	4	5
		486.00 486.00	486.00			486.00	486.00	486.00
5	0	PUBLIC 4-YR NON RESIDENT	1017	2	INCREASE	0.0	%/YR	ADD INTO 0
		BASE 1	2			3	4	5
		1017 1017	1017			1017	1017	1017
6	0	PUBLIC UNIV RESIDENT	649.0	2	INCREASE	0.0	%/YR	ADD INTO 0
		BASE 1	2			3	4	5
		649.00 649.00	649.00			649.00	649.00	649.00
7	0	PUBLIC UNIV NON RESIDENT	1624	2	INCREASE	0.0	%/YR	ADD INTO 0
		BASE 1	2			3	4	5
		1624 1624	1624			1624	1624	1624
8	0	PRIVATE 2-YR RESIDENT	1570	2	INCREASE	0.0	%/YR	ADD INTO 0
		BASE 1	2			3	4	5
		1570 1570	1570			1570	1570	1570
9	0	PRIV 2-YR NON RESIDENT	1570	2	INCREASE	0.0	%/YR	ADD INTO 0
		BASE 1	2			3	4	5
		1570 1570	1570			1570	1570	1570
10	0	PRIVATE 4-YR RESIDENT	2280	2	INCREASE	0.0	%/YR	ADD INTO 0
		BASE 1	2			3	4	5
		2280 2280	2280			2280	2280	2280
11	0	PRIVATE 4-YR NON RESIDENT	2280	2	INCREASE	0.0	%/YR	ADD INTO 0
		BASE 1	2			3	4	5
		2280 2280	2280			2280	2280	2280
12	0	PRIVATE UNIVERSITY RES	2422	2	INCREASE	0.0	%/YR	ADD INTO 0
		BASE 1	2			3	4	5
		2422 2422	2422			2422	2422	2422
13	0	PRIVATE UNIV NON RESIDENT	2422	2	INCREASE	0.0	%/YR	ADD INTO 0
		BASE 1	2			3	4	5
		2422 2422	2422			2422	2422	2422

Figure 2. Sample Computer Run

The questions one could ask include what would be the result, or effect, on private enrollment from a 10% increase in public, resident tuition. Or, what would be the result of awarding $10,000,000 in student aid from the state to the private sector students in terms of enrollment increases or decreases. The model sugests that financial policy decisions in the higher education arena be made with respect to analysis of the entire higher educational system (public and private) with respect to revenue and costs.

Regarding the model structure itself, and the data-input description, reference is again made to Figure 1 and the flow chart. Initially, the model was developed to reflect a status-quo projection of the following variables, assuming no change in state financial policies affecting tuition, student aid, and enrollment. A step-by-step review of the model would follow this pattern:

Step 1. Determine average tuition rates.

Step 2. Calculate Student Aid for the Public and Private institutions for grants and loans.

Step 3. Determine FTE enrollments for the base year and projected years (five).

Step 4. Determine Institutional Income from tuition, the state, and other sources.

Step 5. Total Institutional Revenues are calculated.

Step 6. Total Costs by percent and number are calculated for the state and federal governments, other sources, and the family.

Step 7. Enter changes in Tuition and Student Aid and calculate new enrollment projections leading to changes in costs.

Step 8. Calculate increases or decreases in cost resulting from enrollment changes.

Step 9. Evaluate the effects of financial policy on costs and contributions by source.

In order to further identify the interrelatedness of certain lines (primarily enrollment, tuition and student aid), a line-flow analysis chart and line-dependency matrix is included in the Appendix. These charts will assist the reader in being able to better identify which lines are dependent on which variables.

The Computer Program

Both the NCFPE and SPS models were computer-assisted during their development and used computer programs to help make the analysis of alternative financial policies. Included here is a brief discussion of the primary design influence and program used with the state model.

In 1969 the Midwest Research Institute designed a computer simulation modeling tool to assist colleges in long-range planning. A description of the model and how it is used is contained in the document MRI Report, A Computer Simulation Modeling Tool to Assist Colleges in Long-Range Planning.[4] The tool was developed to assist administrators to make decisions from various alternatives. Called the Higher Education Long-Range Planning (HELP) program, it was developed to: . . . Calculate, or simulate, quickly and accurately, the probable effects of various courses of action . . . officers may construct a mathematical model of their institution, simulate its behavior over a 10-year period . . . and arrive at policy decisions which are more likely to achieve the desired objectives within the anticipated resources.[5]

The MRI program provided the model builder with a matrix of lines and columns, and a number of ways to interrelate and project variables. For example, independent projections could be made such as increasing FTE enrollment by 3 percent over a five-year period, or decreasing tuition in the private sector by 2 percent over a five-year period. Dependent relationships could be built into the model which would allow for changes, for example, with regard to the costs of the State's share of higher education or changes related to the burden of cost sharing by the student or federal government.

Because of the flexibility in the program, which allows the model builder to identify variables and relationships, it was used in the development of the state model.

State Model Format

Having discussed the MRI Program, the following section outlines the way in which data were arrayed on the computer cards before they were entered into the program for the initial base-year run.

Lines 1-22 - Average Tuition by 1) Section 2) Type 3) Residency and 4) Level. Source: Budget Office, Oklahoma State Regents for Higher Education.

Lines 44-118 - Student Aid by the following dichotomies

Grants and Loans, Amount by 1) Sector and 2) Type

Amount Per Student by 1) Sector and 2) Type

Total Amounts by 1) Federal 2) State and 3) Other

Amounts by Source by 1) Federal, State, and Other 2) Type and 3) Sector

Source: Public Institutions, Oklahoma State Regents for Higher Education, Office of State Plan. Private Institutions were

surveyed on an institution by institution basis.

Lines 131-160 - FTE Enrollment by 1) Sector 2) Type 3) Residency and 4) Level. Source: Oklahoma State Regents for Higher Education, Enrollments in Oklahoma Higher Education and Oklahoma Higher Education, Planning for the '80's.

Lines 161-184 - Tuition Income by 1) Sector 2) Type 3) Residency and 4) Level. Source: Oklahoma State Regents for Higher Education, Current Operating Income and Expenditures (at) Oklahoma State Colleges and Universities and Operating Budget Needs of the Oklahoma State System of Higher Education. Information regarding Private institutions was collected from the Director's Office, Oklahoma Association of Independent Colleges and Universities.

Lines 185-193 - Other E&G Income by 1) Sector and 2) Type. Source: Same as previous lines.

Lines 194-198 - State E&G Subsidy by 1) Type. Source: Same as previous lines.

Lines 199-201 - Total Institutional Revenues (Derived from other lines.)

Lines 202-207 - Projected Cost by Source including 1) State 2) Federal 3) Other 4) Family (Tuition-related only). (Derived.)

Lines 208-217 - Analysis of Percentages including 1) % Public Revenues from Tuition 2) % Public Revenues from the State 3) % Public Revenues from Other 4) % Private Revenues from Tuition 5) % Private Revenues from Other 6) % State of Total Costs 7) % Federal of Total Costs 8) % Other of Total Costs and 9) % Family of Total Costs.

Definitions of the categories Sector, Type, Residency and Level may be

operationalized as follows:

1) Sector: Public or Private

2) Type: Doctoral University, 4-year College and University, 2-year College.

3) Residency: Resident or Non-Resident

4) Level: Undergraduate or Graduate

Figures and Tables which help translate the model's outcomes are covered in Chapter IV in the section on Findings. Having discussed the data used in the model and the format input methodology, a description of the initial run follows.

Initial Computer Run

The initial, status-quo, run was made before the alternative policies were assessed. The policies were then compared for their cost change results. The first run reflected, as accurately as possible, current economic conditions and state financial policy with respect to enrollment, institutional income, student aid, and tuition charges at both public and private sector institutions. This run established the data base and five-year projections for later comparison with other policies. In terms of a policy question, the question could be phrased: How do current policies in the public and private sector project in five years with respect to enrollment, income, and student aid; and what will be percentage of share of the costs be in five years?

The initial run and current policy reflected the following assumptions: Enrollments in the public and private sectors at the undergraduate levels will experience very slight changes. The projections were based on data combined from the Oklahoma State Regents' documents, past

enrollments and projected headcount data.

The alternative policies and the results of the computer run are described in Chapters V and VI.

ENDNOTES

[1]National Commission on the Financing of Postsecondary Education, Financing Postsecondary Education in the United States (Washington, 1973), pp. 270-292.

[2]Ibid., pp. 303-316.

[3]Dan S. Hobbs, Oklahoma Higher Education: Planning for the 80's (Oklahoma City, Oklahoma, 1980), p. 15.

[4]Ibid.

[5]Ibid.

CHAPTER IV

HIGHER EDUCATION IN OKLAHOMA

Before proceeding with an analysis of the model and the alternatives to be reviewed, a brief description of the Oklahoma system of higher education is inserted here. The review is included in order to provide a clearer understanding of the structure of the higher education system that will be later examined by the state policy analysis model.

The numbers and variety of institutional types in Oklahoma is great. In the public sector, there are 34 institutions ranging from the junior-college to comprehensive graduate and professional school. In the private sector, there are 13 institutions. Here, too, the range of institutional type varies tremendously from very small, junior colleges to comprehensive graduate institutions. For the most part, the Oklahoma State Regents for Higher Education groups institutions in the following categories:

1. Comprehensive University
2. 4-year Senior College
3. 2-year Junior College
4. Specialized Institutions

In terms of institutional make-up, there are three major graduate universities (2 public and 1 private), twenty 4-year colleges and universities in both the public and private sectors, and sixteen 2-year

colleges. Table III describes the Oklahoma system of higher education institutions by name and type.

TABLE III

OKLAHOMA INSTITUTIONS BY NAME AND TYPE

Comprehensive Universities		4-Year Senior Colleges	
Public	Private	Public	Private
Oklahoma	Tulsa	Central State	Bartlesville Wesleyan
Oklahoma State		E. Ok. St. U.	Bethany Nazarene College
		N.E. Ok. St. U.	Hillsdale Freewill
		N.W. Ok. St. U.	Baptist
		S.E. Ok. St. U.	Midwest Christian College
		S.W. Ok. St. U.	Ok. Baptist U.
		Cameron	Ok. Christian Col.
		Langston	Ok. City U.
		Panhandle	Oral Roberts U.
		USAO	Phillips University
			Southwestern College
2-Year Colleges		**Specialized Institutions**	
Public	Private	Public	Private
CAJC	Bacone	OU Health Sci-	Flaming Rainbow Univ.
Claremore	St. Gregory's	ences Center	Spartan School of
Connors		Ok. St. Tech.	Aeronautics
Eastern		Ok. Col. of Os-	
El Reno		teopathic Med-	
Murray		icine	
NEOAMC		Ok. School of	
NOC		Technical	
ORJC		Training	
Seminole			
SOCJC			
TJC			
WOSC			
Sayre			

Source: Oklahoma State Regents for Higher Education, Planning for the 80's.

Not all the above institutions were included in the study. Excluded were the specialized institutions.

Institutions in the public sector of higher education at the state level in Oklahoma are under the control of a coordinating board of control called the Oklahoma State Regents for Higher Education. Under terms of the Oklahoma constitution, the Regents have responsibility for the following areas:

1. Determine Functions and Courses of Study
2. Prescribe Standards of Education
3. Grant Degrees and Other Forms of Academic Recognition
4. Recommend to State Legislature Budget Allocation
5. Allocate Funds Appropriated by State Legislature
6. Allocate Revolving Funds
7. Determine Student Fees
8. General Coordination
9. Research, Study and Planning[1]

Clearly, the power to allocate funds appropriated by the legislature establishes Oklahoma as one of the country's unique coordinating boards. This power is found in very few of the responsibilities and duties of coordinating agencies throughout the country.

In addition to the Oklahoma Regents for Higher Education, there are 16 Governing Boards which have administrative control over all public institutions. The Governing Boards have duties in the following areas:

1. Management Policy
2. Personnel and Salary Matters
3. Contracting for Services
4. Records Custody

5. Property and Title Holding

6. Academic Administration

7. Student Life

8. Budget Administration

9. Purchasing

10. Plan and Construct Buildings

11. Auxiliary Enterprises

12. General Governance

The following information lists the Governing Boards and the institutions which come under each particular Board:

Board of Regents of the University of Oklahoma

Oklahoma University
University of Oklahoma Health Sciences University
Oklahoma College of Law
GS

Board of Regents of Oklahoma Colleges

Central State University
Eastern Oklahoma State Uniersity
NE Oklahoma State University
NW Oklahoma State University
SE Oklahoma State University
SW Oklahoma State University

Board of Regents for A&M Colleges

Connors State
NE Oklahoma A&M
Cameron University
Oklahoma State Tech
Langston University
Oklahoma State University

Board of Regents of the University of Sciences and Arts of Oklahoma

Board of Regents of Carl Albert Junior College

Board of Regents of Eastern Oklahoma State College

Board of Regents of El Reno Junior College

Board of Regents of Murray State College

Board of Regents of Northern Oklahoma College

Board of Regents of Oscar Rose Junior College

Board of Regents of Rogers State College

Board of Regents of Seminole Junior College

Board of Regents of Oklahoma City Junior College

Board of Regents of Tulsa Junior College

Board of Regents of Western Oklahoma State College

Board of Regents of the Oklahoma College of Osteopathic Medicine and Surgery

Finance

It is not the intent of this study to thoroughly describe and analyze the financial picture of the Oklahoma public and private institutions which comprise the state's higher education system. However, a few salient points may be made. With regard to the public institutions, a tuition policy has been established that keeps the price of attending a public institution as low as possible. Oklahoma students currently pay for about 18% of the cost of attending school. Oklahoma private sector institutions receive no direct legislative support, although some appropriations have been made to students through a tuition aid program designed to help all Oklahoma students pay for college. Private sector students currently pay for about 75% of the cost of higher education (E&G I) through tuition.[3]

For the past ten years, Oklahoma Higher Education has received a little over 20% of the total amount of state appropriated funds. See Table IV, State General Fund Revenues Appropriated for Higher Education

TABLE IV

STATE GENERAL FUND REVENUES APPROPRIATED FOR HIGHER EDUCATION
AS COMPARED WITH HIGHER EDUCATION ENROLLMENTS,
1969-70 THROUGH 1979-80

Fiscal Year	Total State Appropriated Funds	State Appropriated Funds for Higher Education	Percent of State Appropriated Funds For Higher Education	FTE Enrollment Full Year	Fall Headcount Enrollment
1979-80	$1,066,180,484	$230,378,303	21.61	105,477	134,406
1978-79	857,701,379	198,378,303	23.13	102,806	130,346
1977-78	751,525,474	174,528,303	23.22	105,898	131,367
1976-77	671,304,058	153,528,303	22.87	106,035	127,536
1975-76	620,930,674	128,288,303	20.66	105,833	124,757
1974-75	457,057,024	106,218,303	23.24	94,925	110,586
1973-74	402,936,769	91,539,303	22.71	90,339	99,055
1972-73	341,185,363	81,884,303	23.99	89,263	94,637
1971-72	329,945,924	79,694,633	24.15	84,518	92,663
1970-71	334,475,798	69,705,883	20.84	80,929	86,875
1969-70	296,862,565	59,730,883	20.12	76,436	88,709

Source: Hobbs, Dan S. Oklahoma Higher Education: Planning for the 80's. Oklahoma City, Oklahoma: Oklahoma State Regents for Higher Education, 1980.

as Compared with Higher Education Enrollments, 1969-70 through 1979-80.

While the State of Oklahoma has generally maintained a low-cost student fee policy, the costs of attending a particular public institution in Oklahoma varies by type of institution and level of instruction.

In the most recent report from the Chancellor's Office, Planning for the '80's, researchers found that:

> There is currently a rather wide range between and among institutions with regard to the proportion of the total budget made up from legislative appropriations. Some 86.6 percent of the University of Science and Arts of Oklahoma's budget in 1978-79 came from that source, as compared with Tulsa Junior College's proportion of 60.2 percent . . . average for the regional universities was 78 percent . . . 2-year colleges received 72.7 percent.[2]

Another important measurement of financial condition is reflected in the amount of expenditure per Full Time Equivalent (FTE) student. The latest State Regents' report indicated that over a 5-year period, FY 1977-81, the state's major universities were appropriated larger shares of state funds than were the state senior colleges and universities. The senior universities and colleges were appropriated a larger share than were the 2-year junior colleges. See Table V for a comparison of E&G expenditures.

Enrollment

Another important aspect of the Oklahoma Higher Education picture is provided by brief description of the enrollment patterns from both the public and private sectors. The Oklahoma State Regents for Higher Education have maintained enrollment data and developed enrollment forecasts for both the public and private sectors. Fifteen to twenty years

TABLE V

COMPARISON OF EDUCATION AND GENERAL EXPENDITURES BY FUNCTION FOR THE FISCAL YEARS 1977-78 THROUGH 1980-81*

Function and Institution	Amount				Percent of Total Education and General				Amount Per FTE Student*			
	1977-78	1978-79	1979-80	1980-81	1977-78	1978-79	1979-80	1980-81	1977-78	1978-79	1979-80	1980-81
Total Educational and General												
OU	41,007,277	45,642,171	53,150,958	64,468,491	23.3	23.1	24.0	24.7	2,488.00	2,639.04	2,931.34	3,524.79
OSU	42,315,676	47,424,550	51,674,507	61,972,154	24.0	24.1	23.4	23.7	2,093.80	2,330.56	2,564.49	2,996.28
Both Universities	83,322,953	93,066,721	104,825,465	126,440,645	47.3	47.2	47.4	48.4	2,270.88	2,472.28	2,472.28	3,244.31
CSU	14,088,246	15,756,333	17,553,571	19,066,033	08.0	08.0	08.0	07.3	1,463.56	1,863.33	2,063.91	2,172.77
ECOSU	4,698,650	5,293,654	5,800,237	6,997,854	02.7	02.7	02.6	02.7	1,432.95	1,621.33	1,701.45	2,020.75
NEOSU	8,642,454	8,943,997	9,963,502	11,230,475	04.9	04.5	04.5	04.3	1,621.47	1,875.84	2,045.06	2,124.17
NWOSU	2,664,507	2,736,046	2,978,300	3,582,838	01.5	01.4	01.3	01.4	1,741.51	1,885.63	1,898.22	2,460.74
SEOSU	5,935,477	6,153,260	7,060,659	8,181,330	03.4	03.1	03.2	03.1	1,605.48	1,730.87	2,042.42	2,279.56
SWOSU	7,546,450	8,296,927	8,845,439	10,103,734	04.3	04.2	04.0	03.9	1,515.96	1,778.55	1,963.04	2,231.39
Cameron	6,044,390	6,832,464	7,175,842	8,591,706	03.4	03.5	03.3	03.3	1,393.68	1,838.66	1,905.42	2,243.27
Langston	2,343,907	2,488,549	3,494,293	4,169,721	01.3	01.3	01.6	01.6	2,251.59	2,597.65	3,392.52	3,509.87
Panhandle	2,058,717	2,285,035	2,526,336	3,015,623	01.2	01.2	01.1	01.1	2,192.46	2,392.71	2,489.00	2,810.46
USAO	2,480,439	2,619,275	3,035,241	3,275,957	01.4	01.3	01.4	01.2	2,557.15	2,739.83	3,053.57	3,319.11
All Senior Colleges	56,503,237	61,405,540	68,433,420	78,215,271	32.1	31.2	31.0	29.9	1,581.53	1,875.26	2,066.04	2,288.60
CAJC	883,905	1,366,796	1,620,975	2,135,776	00.5	00.7	00.7	00.8	1,076.62	1,490.50	1,699.13	2,102.14
Claremore	1,987,524	2,387,780	2,535,281	2,935,980	01.1	01.2	01.2	01.1	1,263.52	1,619.93	1,890.58	1,983.77
Connors	1,773,544	1,952,730	2,097,503	2,331,857	01.0	01.0	00.9	00.9	1,597.79	2,084.02	2,135.95	2,220.82
Eastern	2,599,778	2,778,280	2,978,205	3,226,518	01.5	01.4	01.4	01.2	1,873.04	2,208.49	2,283.90	2,220.59
El Reno	852,072	1,097,402	1,217,617	1,561,123	00.5	00.6	00.6	00.6	1,191.71	1,712.01	1,831.00	2,262.50
Murray	1,439,795	1,656,344	1,792,643	2,188,640	00.8	00.8	00.8	00.8	1,513.98	1,844.48	1,969.94	2,323.40
NEOAMC	3,336,790	3,843,213	4,179,178	5,077,202	01,9	02.0	01,9	01.9	1,430.26	1,722.64	1,885.06	2,221.00
NOC	1,785,541	2,088,413	2,329,148	2,643,905	01.0	01.1	01.1	01.0	1,364.05	1,648.31	1,936.12	2,174.26
ORJC	6,339,789	7,338,158	8,123,495	9,808,350	03.6	03.7	03.7	03.8	1,147.06	1,434.63	1,527.56	1,803.67
Seminole	1,512,130	1,748,459	2,064,794	2,314,463	00.9	00.9	00.9	00.9	1,345.31	1,663.61	2,024.32	2,231.88
SOCJC	4,381,836	5,053,113	5,791,875	7,050,370	02.5	02.6	02.6	02.7	1,512.54	1,863.24	1,799.28	1,974.34
TJC	7,903,816	9,360,505	10,819,089	12,804,439	04.5	04.7	04.9	05.0	1,747.09	1,984.42	2,044.42	2,195.17
WOSC	1,255,713	1,543,220	1,744,803	2,148,180	00.7	00.8	00.8	00.8	1,157.34	1,438.23	1,633.71	1,974.43
Sayre	324,551	363,211	375,433	423,001	00.1	00.1	00.1	00.2	1,282.81	1,579.18	1,691.14	1,555.15
All 2-Year Colleges	36,376,784	42,577,624	47,670,039	56,649,804	20.6	21.6	21.6	21.7	1,420.41	1,736.37	1,853.79	2,069.63
All Institutions	176,202,974	197,049,885	220,928,924	261,305,720	100.0	100.0	100.0	100.0	1,797.46	2,076.18	2,274.80	2,599.51

*Amounts in dollars.

Source: Hobbs, Dan S. Oklahoma Higher Education: Planning for the 80's. Oklahoma City, Oklahoma: Oklahoma State Regents for Higher Education, 1980.

ago, Oklahoma had a relatively high ratio of institutions to students. This reflected a general attitude that students in the state should not have to travel any great distance from their home to attend a college or university. Latest figures show that Oklahoma ranks 29th among the 50 states in the ratio of colleges and universities to population. Today the average number of students is 5,000 per institution, and there is only one public institution in the state which has less than 1,000 students.[4]

In terms of the number of students enrolled, Table VI, shows a comparison of head-count enrollment from 1950-1979. According to the Regents' report, Oklahoma's 43 public and private institutions tie it with Oregon for the 27th position in total number of colleges and universities open.[5]

TABLE VI

HEAD-COUNT ENROLLMENT IN OKLAHOMA HIGHER EDUCATION FALL SEMESTERS, 1950-1979

Control	1950	1960	% Of Inc.	1970	% Of Inc.	1979	% Of Inc.
Public	30,788	44,590	44.8	91,959	106.2	134,406	46.2
Private	5,060	12,183	140.8	18,119	48.7	22,884	26.3
Total	35,848	56,773	58.4	110,078	93.9	157,290	42.9

Source: Oklahoma State Regents for Higher Education, Planning for the 80's, July 1980, p. 15.

In Summary, Oklahoma's higher education system, including both the public and private sector, is a diverse one in which the public sector dominates the enrollment picture. About 85 percent of Oklahoma's higher education student body attends a public college or university, about 15 percent attend private institutions. Public college and university students enjoy a low-cost education, sharing in less than 20 percent of the costs of higher education in the state. Legislative appropriations since 1969 have steadily increased, with higher education's share of total appropriations averaging a little more than 20 percent.

ENDNOTES

[1]Education Commission of the States, The States and Private Higher Education, Vols. I-VII (Denver, Colorado, 1973-1979).

[2]Dan S. Hobbs, Oklahoma Higher Education: Planning for the 80's (Oklahoma City, Oklahoma, 1980), p. 60.

[3]The results of a survey conducted by the Association of Oklahoma Independent Colleges and Universities.

[4]Hobbs, p. 15.

[5]Ibid.

CHAPTER V

MODEL DEVELOPMENT AND ALTERNATIVE POLICY FINDINGS

This chapter contains a description of the Oklahoma model's operation, how it works, and reviews three alternative policies which were designed to demonstrate the model's utility in assessing various financial policies at the state level.

The model was designed to allow policy changes in tuition and student aid and to test the effects of these changes on enrollment and costs. For example, as one policy question was stated: what will be the cost effects of a 10% increase in tuition for in-state students and 15% for out-of-state students in terms of costs to the state and to the individual institutions? The model was operationalized in two phases, an initial computer run which represented no change in policy from FY 1980-81, and alternative computer runs which represented changes in policy. The differences between the initial run and the alternative run were then analyzed.

Base year data from fiscal year 1980-81 were utilized. Changes from the base year were calculated for the initial run and each alternative, thus providing a basis of comparison between the alternatives. In some cases, schools were asked directly to provide information. The initial forecast assumed the enrollment projections made by the Oklahoma State Regents for Higher Education and no changes in state policies. The initial forecast was then adjusted to make additional enrollment

forecasts dependent on tuition elasticity factors and changes in the number and average amount-per-student of student aid grants. It was assumed that there were no effects of student loans on enrollments, nor were any policy changes related to student loans considered.

In order to include the capability to respond to price changes, particularly where tuition is concerned, tuition elasticity factors for determining the amount of response were selected. The factors selected were identified by Hopkins in which the tuition elasticities of demand were developed to assess the impact of price changes in the public and private sector and the resulting effects on the institutions in each sector. It was one of many identified in an earlier article by Hyde which is located on page 29. Tuition Elasticity is defined here as the percent change in enrollment divided by the percent change in tuition:

$$\frac{\% \text{ Change Enrollment}}{\% \text{ Change Tuition}}$$

Hopkins' study identified the following elasticity of demand coefficients in analyzing the price change effects on enrollment in the public and private sectors. The study also identified the effects of price changes can be seen in Table II of Chapter II.

The Hopkins coefficients describe what happens when an increase of 33.3 percent in tuition occurs in either the public or private sector and the subsequent effects on internal and cross-elasticity lines: Public on Public and Public on Private, and Private on Private and Private on Public. A more complete description of how the Hopkins data were used will follow in the discussion of Alternative 1.

The following three alternative policies were assessed:

Alternative #1 - Policy assessed the effects of a 10% increase in resident undergraduate and graduate tuition in the public sector, and a 15% increase in non-resident undergraduate and graduate tuition.

Alternative #1A - Assessed the same policy as #1. However, because the elasticity coefficients were so low according to Hopkins, the figures arbitrarily were increased by a factor of 5 to demonstrate more exactly the responsiveness of the changes in tuition to changes in enrollments within the public and private sectors.

Rationale: Alternatives #1 and #1A were selected because of the current interest among the Oklahoma State Regents for Higher Education in bringing a student's burden of cost to 25 percent of total costs. Presently, Oklahoma public higher education students pay about 18 percent of the cost of his education through tuition. Also, the Oklahoma State Regents for Higher Education have recommended 10% increases for resident students and 15% for non-resident students until Oklahoma students reach a figure of 25% of the cost of higher education through tuition.

Alternative #2 - Policy assessed the costs of a Tuition Equalization Grant program for Oklahoma private institutions based on a state subsidy of $10 million.

Rationale: Alternative #2 was selected because of the interest in assessing the potential impact of a large amount of student aid into the private sector. Curently, Oklahoma does provide some public funds for private sector students through the Oklahoma Tuition Aid Grant Program. However, in 1981-82 just slightly more than one-half million dollars was awarded to private students. This compares with 2.2 million dollars for total awards. In 1983 the Oklahoma Legislature amended the original Bill to include an increased number of grants to the private and public sectors and to include graduate students as well as undergraduates with regard to eligibility. No data is available which estimates the effects the awards had and will have on the private and public sector enrollments. Consequently, the Alternative, using the Hopkins tuition elasticity coefficients, was used.

Discussion of the alternatives and how they operated follows.

Alternative #1

Alternative #1 seeks to assess the costs and changes in enrollment

assuming a rather healthy increase in tuition on the public institution level, 10% for resident students and 15% for non-resident students. Also, at the beginning of the computer run instructions were included for increases of 10% per year over five years in the public sector tuition area for undergraduates, and 15% per year for graduate students. Private tuition was not increased or decreased but was assumed stable over the projected five-year period. A recalculation of, for example, line 122, public 2-year resident undergraduate enrollment, would be stated that Line 122 is equal to the base year enrollment less the adjusted enrollment change (tuition elasticity coefficient) of -.0066 for a 10% increase in public tuition. A 15% increase for non-resident tuition would be -.0099. An example of how the enrollment adjustment would be made for private sector institutions is written:

Line 132 = L34 + .003 L34 (10% increase on public, resident university students and that effect on private university enrollment).

The coefficients for 10% and 15% were calculated as follows:

Public-Public at 10% = -.066 X .10 = -.0066

Public-Private at 10% = +.030 x .10 = +.0030

Public-Public at 15% = -.066 X .15 = -.0099

Public-Private at 15% = +.030 x .15 = +.0045

Generally, the coefficients tell us that an increase in the public sector tuition lowers enrollments in the public sector and raises enrollments in the private sector while an increase in private sector tuition decreases private enrollments and increases public enrollments.

Alternative #1A

Although the adjusted enrollments, caused by the addition of the tuition elasticity coefficients, reflected the effects of tuition increases, the original coefficients brought only slightly measurable changes to the alternative policy. The observed differences are covered in the next chapter. In order to more fully exploit the elasticity principle, the Hopkins coefficients were arbitrarily increased by a factor of 5.

Thus, the new elasticity figures were as follows:

Public-Public at 10% = -.0330

Public-Private at 10% = +.0150

Public-Public at 15% = -.0495

Public-Private at 15% = +.0225

These factors were recalculated and entered on computer cards. The results will be discussed in Chapter VI.

Alternative #2

A state subsidy of roughly $10 million is allocated to the private sector in the form of student aid. The $10 million figure was derived by calculating, first, one-fourth of the cost of attending a public institution in Oklahoma. This figure was found to be $1,280, or one-half the sum of $2,559 which is the average actual education costs of attending an Oklahoma public college or university for the latest year in which figures were available (1981-82). The $1,280 figure was then multiplied times the number of base-year FTE private sector students:

$640 X 15,221 = $9,742,440

After rounding off the final figure to $10 million, the subsidy was assumed to be utilized by private institution students to help offset the cost of tuition. Tuition elasticity coefficients for private-private and private-public (cross-elasticity) were calculated using a factor of +25% for private institutions and -25% for public institutions. Thus the $10 million represents a 25% reduction in private tuition costs. Using the 25% factor, tuition coefficients for the public and private institutions were as follows:

Private-Private = (+.116)(.25) = +.029

Private-Public = (-.053)(.25) = -.013

These coefficients were derived from the Hopkins Table on Page 30. The rationale for selecting the 25% figure was that it was determined to be large enough to demonstrate the effects of a significant amount of money into the private sector. Realistically, one would not expect an exact 25% increase in private enrollment, or 25% decrease in public enrollment. The tuition elasticity coefficients determined the enrollments for public and private institutions in Alternative #2. The enrollments also only reflect changes in undergraduate enrollment. Graduate enrollments were not affected. Finally, the original tuition rates were not changed, nor reduced by 25%.

No attempt was made to tie increases in private student aid to increases in private enrollments similar to the effort made to tie in tuition elasticity with enrollment change. That is not within the scope of this study, although one would assume some positive change in enrollment given the addition of $10 million into the private Oklahoma college and

university sector, not to mention the public sector as well. Another study might better deal with the causal effects of a dramatic increase in student aid on the public and private sectors.

Alternative Policy Comparisons

In order to assist the reader in comparing the results of the alternative policies, eight tables have been prepared which review the increases or decreases in the amount of dollars in the following areas relative to the base year information:

Enrollment	Tuition Income
Total Institutional Revenues	Projected Costs by Source

These four areas were used to provide comparisons of alternative policies against the base year. First a brief discussion of the comparisons of the base year with the initial projection and each alternative during Year 1 of the projections. Then, a brief discussion of the results of the differences between the base year and the projected fifth year information will be presented.

Enrollment

Reference is made to Table VII, Estimated Changes in Enrollment - First Year. In general, the numbers reflect a decline in Public Enrollment and an increase in Private Enrollment. This is caused by three factors. 1) the loss of public students because of the tuition elasticity factors associated with price increases at the public level, 2) by the increase in private sector enrollment caused by changes in the public pricing policies, and 3) the effects on enrollment from $10,000,000 in student aid associated with increases in the private sector.

TABLE VII

ESTIMATED CHANGES IN FTE ENROLLMENT - FIRST YEAR*

Base Year	Category	Initial Forecast	Alternative 1**		Alternative 1A		Alternative 2	
			A	B	A	B	A	B
	Public UG							
32,642	2-yr Resident	- 637	- 852	-215	-1,714	-1,077	-1,061	- 424
3,911	2-yr Non-Resident	- 77	- 136	- 59	- 271	- 194	- 128	- 51
28,357	4-yr Resident	- 700	- 887	-187	-1,636	- 936	-1,069	- 369
3,264	4-yr Non-Resident	- 89	- 121	- 32	- 251	- 162	- 131	- 42
29,342	Univ Resident	- 751	- 945	-194	-1,719	- 968	-1,022	- 381
3,233	Univ Non-Resident	- 92	- 124	- 32	- 252	- 160	- 134	- 42
	Private UG							
439	2-yr Resident	- 19	- 18	+ 1	- 12	+ 7	- 6	+ 13
296	2-yr Non-Resident	- 60	- 59	+ 1	- 53	+ 7	- 51	+ 9
5,803	4-yr Resident	+ 69	+ 70	+ 1	+ 156	+ 87	+ 237	+ 168
4,749	4-yr Non-Resident	+ 54	+ 75	+ 21	+ 161	+ 107	+ 192	+ 138
2,695	Univ Resident	+ 82	+ 84	+ 2	+ 122	+ 40	+ 160	+ 78
1,154	Univ Non-Resident	+ 359	+ 364	+ 5	+ 385	+ 26	+ 392	+ 33
	Public G							
1,887	4-yr Resident	+ 2	- 10	- 12	- 59	- 62	- 23	- 25
3,213	4-yr Non-Resident	- 101	- 133	- 32	- 260	- 259	- 143	- 42
3,952	Univ Resident	- 98	- 124	- 26	- 228	- 130	- 149	- 51
2,321	Univ Non-Resident	- 59	- 92	- 33	- 174	- 115	- 89	- 30
	Private G							
67	4-yr Resident	+ 1	+ 3	+ 2	+ 3	+ 2	+ 3	+ 2
76	4-yr Non-Resident	+ 1	+ 4	+ 3	+ 3	+ 2	+ 3	+ 2
320	Univ Resident	+ 1	+ 11	+ 10	+ 6	+ 5	+ 10	+ 9
283	Univ Non-Resident	+ 3	+ 4	+ 1	+ 9	+ 6	+ 11	+ 8
112,122	Total Public	-2,602	-3,424	-822	-6,565	-3,963	-4,060	-1,458
15,882	Total Private	+ 491	+ 538	+ 47	+ 780	+ 289	+ 951	+ 460

*FTE is Full-Time Equivalency and is the total semester hours earned divided by the number 30 at the undergraduate level, 24 at the graduate level. The sum of the two numbers is the FTE.

**The alternative enrollments are the difference between the base year figure and the initial year of the alternative. Column A is the combination enrollment of the originally projected increase or decrease plus tuition elasticity coefficients as explained on pages 55-56. Column B shows the effect of multiplying the base year figure by the appropriate coefficient only.

The First Alternative policy demonstrated the effects of increased Tuition in the public sector, assuming no changes in price in the private sector. This assumption is likely unrealistic, but it does demonstrate the impact of only increasing public tuition only.

Alternative 1A increased the tuition elasticity factor by 5 and reflects a greater magnitude of decreases in the public sector and increases in the private sector.

Alternative 2 demonstrates the effects of a $10,000,000 appropriation to private students. The results show an increased drop in public enrollment over the base and Alternative #1 policies and an increase in private enrollment of 780 students.

In analyzing the enrollment comparison table, the analysis was accomplished according to the following manner. First, the Base Year enrollment data is listed to the left of the category. This is the data gathered from FY 1980-81. The Initial Forecast change is the difference between the Base Year data and the first projection year after the Base Year. For example, FTE Public, 2-year enrollment for the Base Year was 32,642. The Initial Year enrollment projection (based on the State Regents' calculations) was 32,005, a difference of -637. The alternative policies also compare the initially projected year with the Base Year data. Hence, Alternative #1 shows an initial projected year figure of 31,790, a difference of -852. Alternative #1 contains the tuition elasticity coefficients for the effects of a 10 percent increase in resident tuition in the public sector and a 15 percent non-resident increase in the public sector. In this example, therefore, 32,005 (the original initial projection) is reduced by a factor of .0066.

32,005 X -.0066 = 31,794 (-211 students)

Tuition elasticity coefficients were then applied to all enrollments depending on the factor (amount of increase or decrease) and the direction of the cross elasticities (an increase in public tuition decreases public enrollment and increases private enrollment.)

In addition, one will observe that even though the elasticity coefficients are positive for the private institutions when public tuition is increased, the projections are still so low that they show a continuing decline. Of course, the strength of decline is somewhat lessened compared with the Initial Forecast decline and, therefore, could be viewed as an indirect increase.

Tuition Income

Table VIII outlines the alternative policies in the first year differences for Tuition Income. It may be seen on page 90.

In general, Total Tuition Income for the Private sector increases in all alternative policies. Again, this is caused by policies which reflect the tuition elasticity effects of increases in the public sector on public sector and private sector institutions and of changes in enrollment in the private sector caused by increased student aid. Public Tuition income increased in Alternatives #1 and #1A, but decreased, because of enrollment declines caused by elasticity factors, in the Initial Year and Alternative #2.

Alternative 1 reflects the effects of the 10% and 15% increases in Tuition of +$3,000,000. This increase occurs despite the fact that enrollment dropped by more than 2,000 students. An increase of +$325,000

TABLE VIII

ESTIMATED CHANGES IN TUITION INCOME - FIRST YEAR

Base Year	Category	Initial Forecast	Alternative 1	Alternative 1A	Alternative 2
	Undergraduate				
	Public				
$11,170,600	2-yr R	-$ 833,000	-$ 93,300	-$ 206,900	-$ 996,800
3,136,500	2-yr NR	+ 141,500	+ 595,900	+ 446,600	+ 141,500
13,781,500	4-yr R	- 340,200	+ 102,800	- 287,500	- 1,245,400
3,319,400	4-yr NR	- 90,500	+ 358,300	+ 211,200	- 900,500
19,042,900	Univ R	- 487,400	+ 1,243,400	+ 704,600	- 719,500
5,250,300	Univ NR	- 149,400	+ 557,700	+ 325,400	- 149,400
	Private				
$ 689,200	2-yr R	-$ 29,800	-$ 265,000	-$ 18,600	-$ 9,000
464,700	2-yr NR	- 94,200	- 92,600	- 85,900	- 83,500
13,230,800	4-yr R	+ 157,300	- 206,600	+ 367,300	+ 554,700
10,827,700	4-yr NR	+ 123,100	- 172,400	+ 369,500	+ 440,700
6,527,200	Univ R	- 770,200	+ 760,200	- 691,100	+ 261,600
2,794,900	Univ NR	+ 869,500	+ 886,000	+ 952,000	+ 975,800
	Graduate				
	Public				
$ 935,900	4-yr R	+$ 1,000	+$ 87,900	+$ 60,700	+$ 1,000
3,267,600	4-yr NR	- 102,700	+ 336,000	+ 191,800	- 102,700
2,558,300	Univ R	- 57,100	+ 174,900	+ 102,200	- 57,100
3,811,000	Univ NR	- 144,300	+ 363,900	+ 196,900	- 144,300
	Private				
$ 152,700	4-yr R	+$ 2,300	+$ 2,800	+$ 4,600	+$ 2,800
173,200	4-yr NR	+ 2,300	+ 3,100	+ 6,300	+ 3,100
775,000	Univ R	+ 7,300	+ 9,600	+ 19,000	+ 9,600
634,400	Univ NR	+ 58,200	+ 61,400	+ 73,800	+ 61,800
$66,274,000	Total Public	-$2,062,100	+$3,727,500	+$1,745,000	-$3,071,300
$36,269,800	Total Private	+$ 325,800	+$ 986,500	+$ 996,900	+$2,217,600

is noted in the private sector.

Alternative 1A slightly decreases in the public sector and increases in the private sector due to the increased loss of student enrollment in the public sector and increased enrollment in the private sector.

Alternative #2 demonstrates a large increase in the public sector and a significant increase in the private caused by the increased state student aid.

Institutional Revenues

Results for the estimated changes in institutional revenues for the first year may be found on page 92 in Table IX. They were derived by adding income from the station, tuition and other income.

Generally, the data demonstrate a loss of institutional income in the public sector and an increase in the private sector. The affected areas are Tuition and State Revenues.

Alternative 1 and 1A reflect the loss of State E&G Subsidy in the public sector because of the tuition elasticity and declining enrollment factors included in those policies, and subsequent increases for the private sector.

Alternative #2 demonstrates a strong increase in Private revenue caused by the increased amount of student aid as reflected through increased Tuition Income.

Costs

Cost changes may be seen in Table X on page 93. State costs were determined by adding the amount of state appropriated funds (E&G I only)

TABLE IX

ESTIMATED CHANGES IN INSTITUTIONAL REVENUES - FIRST YEAR

Base Year	Category	Initial Forecast	Alternative 1	Alternative 1A	Alternative 2
	Public				
$ 66,274,000	Tuition	-$2,061,800	+$3,914,500	+$ 1,745,500	-$ 3,362,900
204,860,800	State	-0-	- 9,077,000*	- 14,736,600	- 9,913,900
10,525,500	Other	-0-	-0-	-0-	-0-
	Private				
$ 36,269,800	Tuition	+$ 326,200	+$ 463,000	+$ 997,300	+$ 2,217,300†
-0-	State	-0-	-0-	-0-	-0-
12,470,800	Other	-0-	-0-	-0-	-0-
$281,660,300	Total Public	-$2,061,800	-$5,162,500	-$12,991,100	-$13,276,800
$ 48,740,600	Total Private	+$ 326,200	+$ 463,000	+$ 997,300	+$ 2,217,300

*The loss of state support is derived by multiplying the average FTE Cost-Per-Student by the total enrollment. The program, therefore, ties enrollment to State E&G I subsidy figures. If one did not calculate in this manner, the overall public revenue loss from the state would not be as large, and might not drop at all.

†Does not reflect $10 million state appropriations to students.

TABLE X

ESTIMATED CHANGES IN COSTS - FIRST YEAR

Base Year	Category	Initial Forecast	Alternative 1	Alternative 1A	Alternative 2
	Public-Private				
$222,449,600	State	+$ 44,100	-$9,032,900	-$14,692,500	-$ 9,869,800
33,786,900	Federal	+ 600	+ 500	+ 500	+ 500
31,856,800	Other	-0-	-0-	-0-	-0-
103,206,540	Family	- 2,398,200	+ 3,714,900	+ 2,080,200	- 542,400
$391,299,800	Total Costs	-$2,353,500	-$5,317,500	-$12,655,800	-$10,411,700

plus state student aid. Federal costs were determined by the amount of federal student aid. Other represents other income identified in the public and private sector budgets. Family costs are associated with tuition income.

Enumerated here are the increases or decreases in Total Costs shared by either the state or federal government, other sources of revenue, and the family (Tuition). Totals are based on both public and private sector information. The results show a steady decrease in overall costs from all four areas for the first year and subsequent two alternatives. However, Alternative #2 demonstrates a stronger difference between the Initial forecast and Alternative #1 Forecast. This is associated with the $10,000,000 increase in state aid to Private sector students.

A comparison is now in order between the base year, initial year (Year 1) and the fifth year projections allowed by the model. These comparisons are important particularly where enrollments and tuition increases are made.

Enrollment - Fifth Year

Table XI on page 95 shows the projected enrollment results over the first year. Generally the increases are either moderate or non-existent Alternatives 1A and 2 show the largest differences between the first and fifth year projections. A difference of +60 students is indicated in Alternative 2 between the initially projected year and the fifth year.

Tuition Income - Fifth Year

These differences are shown in Table XII on page 96. Alternatives

TABLE XI

ESTIMATED CHANGES IN ENROLLMENT - FIFTH YEAR*

Base Year	Category	Initial Forecast	Alternative 1	Alternative 1A	Alternative 2
	FTE Enrollment				
	Public-UG				
32,642	2-yr R	-1,722	-1,927	-2,743	-2,215
3,911	2-yr NR	- 206	- 243	- 390	- 206
28,357	4-yr R	-1,160	-1,340	-2,058	-3,017
3,264	4-yr NR	- 142	- 172	- 296	- 142
29,342	Univ R	- 651	- 841	-1,598	-1,010
3,233	Univ NR	- 147	- 178	- 300	- 147
	Private-UG				
439	2-yr R	- 43	- 42	- 38	- 31
296	2-yr NR	- 89	- 89	- 85	- 83
5,803	4-yr R	+ 270	+ 388	+ 361	+ 450
4,749	4-yr NR	+ 219	+ 241	+ 330	+ 363
2,695	Univ R	+ 118	+ 126	+ 160	+ 199
1,154	Univ NR	+ 51	+ 56	+ 78	+ 85
	Public-G				
1,887	4-yr R	+ 13	-0-	- 50	-0-
3,213	4-yr NR	+ 22	- 11	- 139	- 11
3,952	Univ R	+ 53	+ 26	- 80	+ 26
2,321	Univ NR	+ 30	+ 6	- 87	+ 6
	Private-G				
67	4-yr R	+ 3	+ 3	+ 4	+ 3
76	4-yr NR	+ 3	+ 3	+ 4	+ 3
320	Univ R	+ 2	+ 13	+ 16	+ 13
283	Univ NR	+ 12	+ 13	+ 18	+ 13
112,122	Total Public	-3,910	-4,680	-7,741	-6,758
15,882	Total Private	+ 546	+ 743	+ 848	+1,015

*Without tuition elasticity coefficient responses as per first year forecasts.

TABLE XII

ESTIMATED CHANGES IN TUITION INCOME - FIFTH YEAR

Base Year	Category	Initial Forecast	Alternative 1	Alternative 1A	Alternative 2
	Undergraduate				
	Public				
$11,170,600	2-yr R	-$1,183,500	+$ 4,807,600	+$ 4,383,000	-$1,342,700
3,136,500	2-yr NR	+ 42	+ 3,171,900	+ 2,919,600	+ 31,200
13,781,500	4-yr R	- 563,800	+ 7,365,200	+ 6,803,300	- 1,466,100
3,319,400	4-yr NR	- 144,400	+ 3,005,600	+ 2,752,700	- 144,400
19,042,900	Univ R	- 422,500	+ 10,747,500	+ 9,955,800	- 655,500
5,250,300	Univ NR	- 238,700	+ 4,730,100	+ 4,330,900	- 238,700
	Private				
$ 689,200	2-yr R	-$ 67,500	-$ 67,500	-$ 58,200	-$ 47,900
464,700	2-yr NR	- 139,800	- 138,300	- 132,400	- 130,300
13,230,800	4-yr R	+ 615,600	+ 657,100	+ 823,300	+ 1,026,300
10,827,700	4-yr NR	+ 499,300	+ 550,300	+ 754,100	+ 827,800
6,527,200	Univ R	+ 285,800	+ 306,300	+ 388,000	+ 483,400
2,794,900	Univ NR	+ 123,600	+ 136,700	+ 189,200	+ 208,200
	Graduate				
	Public				
$ 935,900	4-yr R	+$ 6,500	+$ 571,800	+$ 531,700	+ 7,400
3,267,600	4-yr NR	+ 22,300	+ 3,284,200	+ 3,022,100	+ 22,300
2,558,300	Univ R	+ 40,900	+ 1,600,100	+ 1,489,600	+ 40,900
3,811,000	Univ NR	- 100	+ 3,778,300	+ 3,774,400	- 100
	Private				
$ 152,700	4-yr R	+$ 6,900	+$ 7,300	+$ 9,200	+$ 7,300
173,200	4-yr NR	+ 6,900	+ 7,700	+ 10,900	+ 7,700
775,000	Univ R	+ 29,100	+ 31,500	+ 41,100	+ 31,500
634,400	Univ NR	+ 80,000	+ 83,300	+ 96,100	+ 83,300
$66,274,000	Total Public	-$2,833,258	+$43,062,300	+$39,963,100	-$3,745,700
$36,269,800	Total Private	+$1,439,900	+$ 1,576,200	+$ 2,121,300	+$2,497,300

1 and 1A show increases over the Initial projections for public institutions. This is because the 10% and 15% increases were made over a five year period. Consequently, by the time the increase is made for the final year, it is substantially larger than the initially-projected year. Private institutions generally show a steady increase. However, declining public enrollments are noted for the Year 5 and Alternative 2.

Institutional Revenues - Fifth Year

These figures are included in Table XIII and may be seen on page 98.

The alternative differences demonstrate a turnaround from declining institutional revenues in the fifth year. All three alternative policies demonstrate an increase in fifth year revenues total over first year revenues. Public sector revenues show a steady increase, then decline in Alternative 2 caused by a decline in enrollment. Private sector revenues show a steady increase with all alternatives.

Costs - Fifth Year

Estimated changes in costs between the first and fifth years are listed on page 99 in the final table, Table XIV. Total Costs for both the public and private sector institutions shows an increase in two out of three alternative policies. Again, this is due largely to the Family portion of the shared cost data which is derived from Tuition Income. Regarding Alternative 2, costs decrease by -$4,149,200 due largely to the decreased costs to the state caused by the loss of enrollment plus the increase in state student aid to private students. Family costs increase because in the model, family costs are related to tuition

TABLE XIII

ESTIMATED CHANGES IN INSTITUTIONAL REVENUES - FIFTH YEAR

Base Year	Category	Initial Forecast	Alternative 1	Alternative 1A	Alternative 2
	Public				
$ 66,274,000	Tuition	-$2,451,600	+$43,012,700	+$39,663,900	-$ 3,745,700
204,860,800	State	-0-	- 7,900,900	- 13,520,100	+ 6,186,300
10,525,500	Other	-0-	-0-	-0-	-0-
	Private				
$ 36,269,800	Tuition	+$1,440,200	+$ 1,576,500	+$ 2,121,900	+$ 2,497,500
-0-	State	-0-	-0-	-0-	-0-
12,470,800	Other	-0-	-0-	-0-	-0-
$281,660,300	Total Public	-$2,451,600	+$35,111,800	+$26,143,800	+$ 2,440,200
$ 48,740,600	Total Private	+$1,440,200	+$ 1,576,500	+$ 2,121,900	+$ 2,497,500

TABLE XIV

ESTIMATED CHANGES IN COSTS - FIFTH YEAR

Base Year	Category	Year 5	Alternative 1	Alternative 1A	Alternative 2
	Public-Private				
$222,449,600	State	+$ 44,100	-$ 7,856,800	-$13,476,000	-$11,402,500
33,786,900	Federal	+ 600	+ 500	+ 500	+ 500
31,856,800	Other	-0-	-0-	-0-	-0-
103,206,800	Family	- 1,674,000	+ 43,976,200	+ 41,122,800	+ 7,253,300
$391,299,800	Total Costs	-$1,629,300	+$36,119,400	+$27,603,600	-$ 4,149,200

income.

Summary

In summary, the tables included in this chapter identify the more highly affected areas of Enrollment, Tuition Income, Institutional Aid and overall Costs. For a more detailed review of the model's findings, a computer printout of the Base Year data is included in Appendix A.

Generally, the results of the comparisons may be stated as follows:

1. No significant differences were noted between the four identified areas between the base year and the first year of the initial forecast.
2. Significant differences begin to show in the alternative policies.
3. Enrollments tend to decrease in the public sector and increase in the private sector.
4. Tuition Income decreases during the first year of the initial forecast in the public sector, but increases slightly in the private sector. It then increases for both sectors moderately steady. In the fifth year, Tuition Income sharply increases for both sectors.
5. Institutional Revenues decrease in the first year of the initial forecast in the public sector and increase in the private sector. In the fifth year, they show overall increases, particularly in Alternative 2.
6. Costs generally decrease the first year in the initial and alternative forecasts with the exception of Alternative 2, but increase by the fifth projected year.

CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

The researcher's major objective was to develop and assess a computer simulation tool for assessing financial policy alternatives at the state level in higher education. One would anticipate that such a tool might be useful in assisting state level policy makers in decision making. The approach to the model's construction was similarly patterned after a model used by the National Commission on Financing Postsecondary Education. Following a recommendation by the Commission to develop other models, the analytical framework was constructed, data gathered and alternative policies analyzed.

In assessing the feasibility of developing and using such a model, the following conclusions were made with regard to four specific areas:

Data Collection

Model Limitations

Model Use

Computer Capability

This chapter will address the conclusions and recommendations relative to these areas.

Data

As a result of research, much information from both the public and

private sectors of Oklahoma Higher Education for FY 1981-82 was compiled. While the information from the public sector was abundant, accessible and consistently tabulated, information from the private sector was not. This is not to say that the information from the private sector is erroneous, only to show that this type of activity depends on being able to secure accurate, consistent data. Hence, one recommendation is that some method of aggregating data across both the public and private sectors of higher education be devised. Perhaps data gathered for this study could serve as a beginning for collection of information on all Oklahoma institutions of higher learning, despite some of the political problems that one would anticipate. Nevertheless, the differences between the two sectors and within the two sectors, with respect to enrollment, tuition, tuition income, student aid and institutional revenues and costs, is observable.

Limitations

There are some inherent limitations in the model which deserve identification. The most obvious limitation is that the program which greatly influenced the model's design, the Higher Education Long-Range Planning program, was developed by the Midwest Research Institute to assist planners in simulation modeling for efffects of changes in individual institutional settings. This is not to say that the state model is inaccurate, or does not work. It will need future refinement and testing to make it more appropriate for state-level planning. Another recommendation, then, is that further development of the model be tested to insure more state level responsiveness.

The above comments relate to the model's analytical abilities in

being able to assess alternative financial policies. The model seems to deal with questions of cost well. However, the model is not sensitive enough to those variables which often control prices including, for example, geographic economic differences, inflation, or changes in manpower needs. As constructed, the model is a cost-analysis tool for determining changes in the overall costs that affect institutions, states, and individuals who serve and are served by higher education. For example, Alternative 2 assesses the cost impact of enfusing $10 million in Grant money to private students. It does not indicate what the result, or actual results, of this action will be. Only the marketplace will provide this answer.

Finally, the model is not as sensitive to issues and questions concerning access and choice as it is on questions of cost. Further model development could increase its responsiveness in these areas.

Model Use

Brief mention should be made regarding the model's computer use methodology. It is extremely lengthy and cumbersome. Data must be punched on cards, which is time consuming. When changes are needed, or alternative policies run with different cards, often mistakes of perhaps one line on the data card causes the run to be invalidated. These changes take long hours to perfect a particular policy computer run. One recommendation is that alternative methods be designed that are less time consuming and less cumbersome to use. For example, there are currently programs which require no printouts until the alternative policy is actually ready to be printed in errorless form. This is not a limitation of the study, only a part of the methodology which could be

improved.

Computer Capability

The computer capabilities are associated with the comments regarding Model Use. Further development of the state model with more sophisticated programming and hardware should make the task not only easier, but more complete. The recommendation is made that more suitable, compatible programs be sought out and utilized to foster a more utilitarian modeling tool.

Nevertheless, the state model as presented in this study does allow for analysis of alternative financing plans at the state level. The observed differences between the base year policy and the initial and alternative projections were demonstrated and shown in the comparative tables. Thus, the conclusion is that the model's utility for analyzing alternative financing policies is supported. The model is most responsive to changes in costs associated with pricing.

Conclusions

In summary, the study assessed the utility of a state model to a state model to determine differences between alternative financing policies. Generally, the issues dealt with included access, represented by total enrollments, choice represented by differences in the effects of the type of institution (2-year, 4-year, and university by public or private sector), and costs. A framework was initiated for the analysis of financial policy not only in the public sector, but in the private as well.

The study's major conclusions may be summarized as follows:

The Model can assist policy makers to determine differences between alternative policies and these differences are observable in the print-outs from the computer.

The model's development is probably in the early stage and needs further refinement to make it more sensitive to other variables not related primarily to costs.

Information for determining the base year is more accessible and consistently tabulated and aggregated by the public sector than is information for the private sector.

Recommendations

The study's major recommendations may be summarized as follows:

A more uniform methodology for storing and gathering data relevant to tuition, student aid, enrollment, and institutional budgets, for private as well as public institutions, should be developed.

State agencies should consider the use of models like the one in this study to assist them in planning and decision-making.

Further development of the state model should be done to improve the model's sensitivity to the effects of changes on institutional types as opposed to sector changes, or tuition-enrollment changes. In other words, an intra-analysis component would heighten the model's sensitivity.

Better information regarding the interplay of socio-economic levels of students should be made. This would assist analysis of different types of students being able to attend different types of institutions.

A study should be made to determine the status of statewide model development at the current time. This is especially appropriate in a time when state legislatures and governing bodies are becoming more concerned about the quality of higher education in this country.

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APPENDIX A

COMPUTER RUN - ALTERNATIVE 2

LINE	CF	PLANNING ITEM	BASE	CODE	METHOD OF COMPUTATION				TOTALS
1	0	AVERAGE TUITION-UNDERGRAD							
2	0	PUBLIC 2-YR RESIDENT BASE 1: 323.00	323.0	2	INCREASE 0.0 %/YR 2: 323.00		3: 323.00	4: 323.00	ADD INTO 0 5: 323.00
3	0	PUBLIC 2-YR NON RESIDENT BASE 1: 855.00	855.0	2	INCREASE 0.0 %/YR 2: 855.00		3: 855.00	4: 855.00	ADD INTO 0 5: 855.00
4	0	PUBLIC 4-YR RESIDENT BASE 1: 486.00	486.0	2	INCREASE 0.0 %/YR 2: 486.00		3: 486.00	4: 486.00	ADD INTO 0 5: 486.00
5	0	PUBLIC 4-YR NON RESIDENT BASE 1: 1017	1017	2	INCREASE 0.0 %/YR 2: 1017		3: 1017	4: 1017	ADD INTO 0 5: 1017
6	0	PUBLIC UNIV RESIDENT BASE 1: 649.00	649.0	2	INCREASE 0.0 %/YR 2: 649.00		3: 649.00	4: 649.00	ADD INTO 0 5: 649.00
7	0	PUBLIC UNIV NON RESIDENT BASE 1: 1624	1624	2	INCREASE 0.0 %/YR 2: 1624		3: 1624	4: 1624	ADD INTO 0 5: 1624
8	0	PRIVATE 2-YR RESIDENT BASE 1: 1570	1570	2	INCREASE 0.0 %/YR 2: 1570		3: 1570	4: 1570	ADD INTO 0 5: 1570
9	0	PRIV 2-YR NON RESIDENT BASE 1: 1570	1570	2	INCREASE 0.0 %/YR 2: 1570		3: 1570	4: 1570	ADD INTO 0 5: 1570
10	0	PRIVATE 4-YR RESIDENT BASE 1: 2280	2280	2	INCREASE 0.0 %/YR 2: 2280		3: 2280	4: 2280	ADD INTO 0 5: 2280
11	0	PRIVATE 4-YR NON RESIDENT BASE 1: 2280	2280	2	INCREASE 0.0 %/YR 2: 2280		3: 2280	4: 2280	ADD INTO 0 5: 2280
12	0	PRIVATE UNIVERSITY RES BASE 1: 2422	2422	2	INCREASE 0.0 %/YR 2: 2422		3: 2422	4: 2422	ADD INTO 0 5: 2422
13	0	PRIVATE UNIV NON RESIDENT BASE 1: 2422	2422	2	INCREASE 0.0 %/YR 2: 2422		3: 2422	4: 2422	ADD INTO 0 5: 2422

ANALYSIS OF PLANNING MATRIX STATE POLICY MODEL JUN 3, 1983

LINE	CF	PLANNING ITEM	BASE	CODE	METHOD OF COMPUTATION				TOTALS
14	C	AVERAGE TUITION - GRADUATE							
15	C	PUBLIC 4-YR RESIDENT	496.0	2	INCREASE 0.0 %/YR				ADD INTO 0
		BASE 1			2		3	4	5
		496.00	496.00		496.00		496.00	496.00	496.00
16	C	PUBLIC 4-YR NON RESIDENT	1017	2	INCREASE 0.0 %/YR				ADD INTO 0
		BASE 1			2		3	4	5
		1017	1017		1017		1017	1017	1017
17	C	PUBLIC UNIV RESIDENT	649.0	2	INCREASE 0.0 %/YR				ADD INTO 0
		BASE 1			2		3	4	5
		649.00	649.00		649.00		649.00	649.00	649.00
18	C	PUBLIC UNIV NON RESIDENT	1621	2	INCREASE 0.0 %/YR				ADD INTO 0
		BASE 1			2		3	4	5
		1621	1621		1621		1621	1621	1621
19	C	PRIVATE 4-YR RESIDENT	2280	2	INCREASE 0.0 %/YR				ADD INTO 0
		BASE 1			2		3	4	5
		2280	2280		2280		2280	2280	2280
20	C	PRIVATE 4-YR NONRESIDENT	2280	2	INCREASE 0.0 %/YR				ADD INTO 0
		BASE 1			2		3	4	5
		2280	2280		2280		2280	2280	2280
21	C	PRIVATE UNIV RESIDENT	2422	2	INCREASE 0.0 %/YR				ADD INTO 0
		BASE 1			2		3	4	5
		2422	2422		2422		2422	2422	2422
22	C	PRIVATE UNIV NON RESIDENT	2422	2	INCREASE 0.0 %/YR				ADD INTO 0
		BASE 1			2		3	4	5
		2422	2422		2422		2422	2422	2422
23	C	ADJUSTED G & UG ENROLLMENT							
24	C	PUBLIC 2-YR RESIDENT	34584	5	USER SUPPLIED DATA				ADD INTO 0
		BASE 1			2		3	4	5
		34584	32005		30841		30522	30920	30920
25	C	PUBLIC 2-YR NON RESIDENT	1969	5	USER SUPPLIED DATA				ADD INTO 0
		BASE 1			2		3	4	5
		1969	3834		3695		3705	3705	3705
26	C	PUBLIC UNIV RESIDENT	28357	5	USER SUPPLIED DATA				ADD INTO 0
		BASE 1			2		3	4	5
		28357	27657		27296		27197	27197	27197

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LINE	CF	PLANNING ITEM	BASE	CODE	METHOD OF COMPUTATION				TOTALS
27	0	PUBLSC 4-Y9 NON 9ES9DENT	3264	5	USER SUPPLIED DATA				ADD INTO 0
		BASE 1			2	3	4	5	
		3264 3175			3134	3122	3122	3122	
28	0	PUELSC UNSVESS9TY 9ESSCENT	29342	5	USER SUPPLIED DATA				ADD INTO 0
		BASE 1			2	3	4	5	
		29342 28591			28216	28691	28691	28691	
29	0	PUBLSC UN9V NON 9ES9DENT	3233	5	USER SUPPLIED DATA				ADD INTO 0
		BASE 1			2	3	4	5	
		3233 3141			3100	3086	3086	3086	
30	0	P99VATE 2-Y9 9ES9DENT	439.0	5	USER SUPPLIED DATA				ADD INTO 0
		BASE 1			2	3	4	5	
		439.00 420.00			402.00	385.00	396.00	396.00	
31	0	PSSVATE 2-Y9 NON 9ES9DENT	296.0	5	USER SUPPLIED DATA				ADD INTO 0
		BASE 1			2	3	4	5	
		296.00 236.00			226.00	216.00	207.00	207.00	
32	0	PSSVATE 4-Y9 9ES9DENT	5803	5	USER SUPPLIED DATA				ADD INTO 0
		BASE 1			2	3	4	5	
		5803 5872			5938	6005	6073	5073	
33	0	PSSVATE 4-Y9 NON 9ESSDENT	4749	5	USER SUPPLIED DATA				ADD INTO 0
		BASE 1			2	3	4	5	
		4749 4803			4857	4912	4968	4968	
34	0	P99VATE UN9V 9ES9DENT	2695	5	USER SUPPLIED DATA				ADD INTO 0
		BASE 1			2	3	4	5	
		2695 2724			2753	2783	2813	2813	
35	0	PSSVATE UN9V NON 9ES9DENT	1154	5	USER SUPPLIED DATA				ADD INTO 0
		BASE 1			2	3	4	5	
		1154 1513			1179	1198	1205	1205	
36	0	PUBLSC 4-Y9 9ES9DENT	1887	5	USER SUPPLIED DATA				ADD INTO 0
		BASE 1			2	3	4	5	
		1887 1889			1890	1900	1900	1900	
37	0	PUBL9C 4-Y9 NON 9ESSDENT	3213	5	USER SUPPLIED DATA				ADD INTO 0
		BASE 1			2	3	4	5	
		3213 3112			3139	3235	3235	3235	
38	0	PUBL9C UN9VE9S9TY 9ESSCENT	3952	5	USER SUPPLIED DATA				ADD INTO 0
		BASE 1			2	3	4	5	
		3952 3854			3886	4005	4005	4005	
39	0	PUBLSC UN9V NON 9ES9DENT	2321	5	USER SUPPLIED DATA				ADD INTO 0
		BASE 1			2	3	4	5	
		2321 2262			2282	2351	2351	2351	

LINE	CF	PLANNING ITEM	BASE	CODE	METHOD OF COMPUTATION	TOTALS
40	0	PRIVATE 4-YR RESIDENT	67.0	5	USER SUPPLIED DATA	ADD INTO 0
		BASE 1	66.00		2 69.00 3 70.00 4 70.00	5 70.00
		67.00				
41	C	PRIVATE 4-YR NON RESIDENT	76.0	5	USER SUPPLIED DATA	ADD INTO 0
		BASE 1	77.00		2 77.00 3 78.00 4 79.00	5 79.00
		76.00				
42	0	PRIVATE UNIV RESIDENT	320.0	5	USER SUPPLIED DATA	ADD INTO 0
		BASE 1	323.00		2 326.00 3 329.00 4 332.00	5 332.00
		320.00				
43	0	PRIVATE UNIV NON RESIDENT	283.0	5	USER SUPPLIED DATA	ADD INTO 0
		BASE 1	286.00		2 288.00 3 292.00 4 295.00	5 295.00
		283.00				
44	0	STUDENT AID GRANTS TOTAL $				
45	C	PUBLIC 2-YR	20257	6	100.00 63 4 0.0 85 0 0.0 0 0 0.0 0	ADD INTO 51
		BASE 1	20165		2 20165 3 20165 4 20165	5 20165
		20257				
46	C	PUBLIC 4-YR	24182	6	100.00 64 4 0.0 86 0 0.0 0 0 0.0 C	ADD INTO 51
		BASE 1	22679		2 22679 3 22679 4 22679	5 22679
		24182				
47	C	PUBLIC UNIVERSITY	16761	6	100.00 65 4 0.0 87 0 0.0 0 0 0.0 0	ADD INTO 51
		BASE 1	16775		2 16775 3 16775 4 16775	5 16775
		16761				
48	C	PRIVATE 2-YR	505.0	6	100.00 66 4 0.0 88 0 0.0 0 0 0.0 0	ADD INTO 52
		BASE 1	505.88		2 505.88 3 505.88 4 505.88	5 505.88
		505.00				
49	0	PRIVATE 4-YR	3878	6	100.00 67 4 0.0 89 0 0.0 0 0 0.0 C	ADD INTO 52
		BASE 1	3882		2 3882 3 3882 4 3882	5 3882
		3878				
50	C	PRIVATE UNIVERSITY	2500	6	100.00 68 4 0.0 90 0 0.0 0 0 0.0 0	ADD INTO 52
		BASE 1	2500		2 2500 3 2500 4 2500	5 2500
		2500				
51	0	TOTAL # GRANTS - PUBLIC	0.0	1	TOTAL FROM OTHER LINES	ADD INTO 80
		BASE 1	59621		2 59621 3 59621 4 59621	5 59621
		0				
52	C	TOTAL # GRANTS - PRIVATE	0.0	1	TOTAL FROM OTHER LINES	ADD INTO 81
		BASE 1	6838		2 6888 3 6888 4 6888	5 6888
		0				

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LINE	CH	PLANNING ITEM	BASE	CODE	METHOD OF COMPUTATION			TOTALS
53	0	STUDENT AID - LOANS-TOTAL #						
54	C	PUBLIC	4866	3	INCREASE	0.0 /YR		ADD INTO 60
		BASE 1	4866		2 4866	3 4866	4 4866	5 4866
55	0	PUBLIC 4-YR	8574	3	INCREASE	0.0 /YR		ADD INTO 60
		BASE 1	8574		2 8574	3 8574	4 8574	5 8574
56	0	PUBLIC UNIVERSITY	10982	3	INCREASE	0.0 /YR		ADD INTO 60
		BASE 1	10982		2 10982	3 10982	4 10982	5 10982
57	C	PRIVATE 2-YR	104.0	3	INCREASE	0.0 /YR		ADD INTO 61
		BASE 1	104.00		2 104.00	3 104.00	4 104.00	5 104.00
58	0	PRIVATE 4-YR	3004	3	INCREASE	0.0 /YR		ADD INTO 61
		BASE 1	3004		2 3004	3 3004	4 3004	5 3004
59	C	PRIVATE UNIVERSITY	3239	3	INCREASE	0.0 /YR		ADD INTO 61
		BASE 1	3239		2 3239	3 3239	4 3239	5 3239
60	0	TOTAL # LOANS - PUBLIC	0.0	1	TOTAL FROM OTHER LINES			ADD INTO 80
		BASE 1	24422		2 24422	3 24422	4 24422	5 24422
61	C	TOTAL # LOANS - PRIVATE	0.0	1	TOTAL FROM OTHER LINES			ADD INTO 81
		BASE 1	6347		2 6347	3 6347	4 6347	5 6347
62	C	STUDENT AID-GRANTS $$ (000)						
63	C	PUBLIC 2-YR	90140	2	INCREASE	0.0 %/YR		ADD INTO 69
		BASE 1	90140		2 90140	3 90140	4 90140	5 90140
64	C	PUBLIC 4-YR	121110	2	INCREASE	0.0 %/YR		ADD INTO 69
		BASE 1	121110		2 121110	3 121110	4 121110	5 121110
65	0	PUBLIC UNIVERSITY	89750	2	INCREASE	0.0 %/YR		ADD INTO 69
		BASE 1	89750		2 89750	3 89750	4 89750	5 89750

LINE	Ch	PLANNING ITEM	BASE	CODE	METHOD OF COMPUTATION	1	2	3	4	TOTALS	5
66	0	PRIVATE 2-YR	1548	2	INCREASE 0.0 %/YR	1548	1548	1548	1548	ADD INTO 70	1548
67	0	PRIVATE 4-YR	32648	2	INCREASE 0.0 %/YR	32648	32648	32648	32648	ADD INTO 70	32648
68	0	PRIVATE UNIVERSITY	31557	2	INCREASE 0.0 %/YR	31557	31557	31557	31557	ADD INTO 70	31557
69	0	TOTAL $$ GRANTS - PUBLIC	0.0	1	TOTAL FROM OTHER LINES	301000	301000	301000	301000	ADD INTO 82	301000
70	0	TOTAL $$ GRANTS - PRIVATE	0.0	1	TOTAL FROM OTHER LINES	65753	65753	65753	65753	ADD INTO 83	65753
71	0	STUDENT AID-LOANS $$ (000)									
72	0	PUBLIC 2/YR	27460	2	INCREASE 0.0 %/YR	27460	27460	27460	27460	ADD INTO 78	27460
73	0	PUBLIC 4-YR	71310	2	INCREASE 0.0 %/YR	71310	71310	71310	71310	ADD INTO 78	71310
74	0	PUBLIC UNIVERSITY	151260	2	INCREASE 0.0 %/YR	151260	151260	151260	151260	ADD INTO 78	151260
75	0	PRIVATE 2-YR	979.00	2	INCREASE 0.0 %/YR	979.00	979.00	979.00	979.00	ADD INTO 79	979.00
76	0	PRIVATE 4-YR	30308	2	INCREASE 0.0 %/YR	30308	30308	30308	30308	ADD INTO 79	30308
77	0	PRIVATE UNIVERSITY	38065	2	INCREASE 0.0 %/YR	38065	38065	38065	38065	ADD INTO 79	38065
78	0	TOTAL $$ LOANS - PUBLIC	0.0	1	TOTAL FROM OTHER LINES	250030	250030	250030	250030	ADD INTO 82	250030

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LINE	CF	PLANNING ITEM	BASE	CODE	METHOD OF COMPUTATION			TOTALS
79	0	TOTAL $$ LOANS - PRIVATE	0.0	1	TOTAL FROM OTHER LINES			ADD INTO 83
		BASE 1 / 0	69352		2 / 69352	3 / 69352	4 / 69352	5 / 69352
80	0	STUDENT AID-TOTAL # PUBLIC	0.0	1	TOTAL FROM OTHER LINES			ADD INTO 0
		BASE 1 / 0	84043		2 / 84043	3 / 84043	4 / 84043	5 / 84043
81	0	STUDENT AID-TOTAL # PRIVATE	0.0	1	TOTAL FROM OTHER LINES			ADD INTO 0
		BASE 1 / 0	13235		2 / 13235	3 / 13235	4 / 13235	5 / 13235
82	0	STUDENT AID-TOTAL $ PUBLIC	0.0	1	TOTAL FROM OTHER LINES			ADD INTO 0
		BASE 1 / 0	551030		2 / 551030	3 / 551030	4 / 551030	5 / 551030
83	0	STUDENT AID-TOTAL $ PRIVATE	0.0	1	TOTAL FROM OTHER LINES			ADD INTO 0
		BASE 1 / 0	135105		2 / 135105	3 / 135105	4 / 135105	5 / 135105
84	0	STUDENT AID AMT/STD GRANTS						
85	0	PUBLIC 2-YR	447.0	2	INCREASE 0.0 %/YR			ADD INTO 0
		BASE 1 / 447.00	447.00		2 / 447.00	3 / 447.00	4 / 447.00	5 / 447.00
86	0	PUBLIC 4-YR	534.0	2	INCREASE 0.0 %/YR			ADD INTO 0
		BASE 1 / 534.00	534.00		2 / 534.00	3 / 534.00	4 / 534.00	5 / 534.00
87	0	PUBLIC UNIVERSITY	535.0	2	INCREASE 0.0 %/YR			ADD INTO 0
		BASE 1 / 535.00	535.00		2 / 535.00	3 / 535.00	4 / 535.00	5 / 535.00
88	0	PRIVATE 2-YR	306.0	2	INCREASE 0.0 %/YR			ADD INTO 0
		BASE 1 / 306.00	306.00		2 / 306.00	3 / 306.00	4 / 306.00	5 / 306.00
89	0	PRIVATE 4-YR	841.0	2	INCREASE 0.0 %/YR			ADD INTO 0
		BASE 1 / 841.00	841.00		2 / 841.00	3 / 841.00	4 / 841.00	5 / 841.00
90	0	PRIVATE UNIVERSITY	1262	2	INCREASE 0.0 %/YR			ADD INTO 0
		BASE 1 / 1262	1262		2 / 1262	3 / 1262	4 / 1262	5 / 1262
91	0	STUDENT AID AMT/STD LOANS						

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LINE	CH	PLANNING ITEM	BASE	EASE	CODE	METHOD OF COMPUTATION	TOTALS
92	C	PUBLIC 2-YR	564.00	564.0	6	100.00 72 4 0.0 54 0 0.0 0 0 0.0 0	ADD INTO 0
		BASE	1			2 3 4	5
		564.00	564.32			564.32 564.32 564.32	564.32
93	0	PUBLIC 4-YR	832.00	832.0	6	100.00 73 4 0.0 55 0 0.0 0 0 0.0 0	ADD INTO 0
		BASE	1			2 3 4	5
		832.00	831.70			831.70 831.70 831.70	831.70
94	0	PUBLIC UNIVERSITY	1377	1377	6	100.00 74 4 0.0 56 0 0.0 0 0 0.0 0	ADD INTO 0
		BASE	1			2 3 4	5
		1377	1377			1377 1377 1377	1377
95	C	PRIVATE 2-YR	941.00	941.0	6	100.00 75 4 0.0 57 0 0.0 0 0 0.0 0	ADD INTO 0
		BASE	1			2 3 4	5
		941.00	941.35			941.35 941.35 941.35	941.35
96	C	PRIVATE 4-YR	1008	1008	6	100.00 76 4 0.0 58 0 0.0 0 0 0.0 0	ADD INTO 0
		BASE	1			2 3 4	5
		1008	1008			1008 1008 1008	1008
97	0	PRIVATE UNIVERSITY	1175	1175	6	100.00 77 4 0.0 59 0 0.0 0 0 0.0 0	ADD INTO 0
		BASE	1			2 3 4	5
		1175	1175			1175 1175 1175	1175
98	0	STUDENT AID BY SOURCE					
99	C	PUBLIC % FEDERAL	52.00	52.0	3	INCREASE 0.0 /YR	ADD INTO 0
		BASE	1			2 3 4	5
		52.00	52.00			52.00 52.00 52.00	52.00
100	C	PUBLIC % STATE	32.00	32.0	3	INCREASE 0.0 /YR	ADD INTO 0
		BASE	1			2 3 4	5
		32.00	32.00			32.00 32.00 32.00	32.00
101	0	PUBLIC % OTHER	16.00	16.0	3	INCREASE 0.0 /YR	ADD INTO 0
		BASE	1			2 3 4	5
		16.00	16.00			16.00 16.00 16.00	16.00
102	0	PRIVATE % FEDERAL	38.00	38.0	3	INCREASE 0.0 /YR	ADD INTO 0
		BASE	1			2 3 4	5
		38.00	38.00			38.00 38.00 38.00	38.00
103	C	PRIVATE % STATE	7.00	7.0	3	INCREASE 0.0 /YR	ADD INTO 0
		BASE	1			2 3 4	5
		7.00	7.00			7.00 7.00 7.00	7.00
104	C	PRIVATE % OTHER	55.00	55.0	3	INCREASE 0.0 /YR	ADD INTO 0
		BASE	1			2 3 4	5
		55.00	55.00			55.00 55.00 55.00	55.00

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LINE	CH	PLANNING ITEM	BASE	CODE	METHOD OF COMPUTATION					TOTALS
105	0	AMOUNT PUBLIC FED AID (CO)	286530	6	0.0	82 3	0.01 99 0	0.0	0 0 0.0 0	ADD INTO 194
		BASE 1	286535		2 286535		3 286535		4 286535	5 286535
106	0	AMOUNT PUBLIC STATE AID(00)	175888	6	0.0	82 3	0.01 100 0	0.0	0 0 0.0 0	ADD INTO 0
		BASE 1	176329		2 176329		3 176329		4 176329	5 176329
107	0	AMOUNT PUBLIC OTHER AID(00)	88602	6	0.0	82 3	0.01 101 0	0.0	0 0 0.0 0	ADD INTO 0
		BASE 1	88164		2 88164		3 88164		4 88164	5 88164
108	0	AMOUNT PRIVATE FED AID (00)	51339	2	INCREASE	0.0 %/YR				ADD INTO 194
		BASE 1	51339		2 51339		3 51339		4 51339	5 51339
109	0	AMOUNT PRIVATE ST AID (00)	9457	2	INCREASE	0.0 %/YR				ADD INTO 0
		BASE 1	9457		2 9457		3 9457		4 9457	5 9457
110	0	AMOUNT PRIVATE OTHR AID(00)	74307	2	INCREASE	0.0 %/YR				ADD INTO 0
		BASE 1	74307		2 74307		3 74307		4 74307	5 74307
111	0	E&G SUBSIDY PER FTE-PUBLIC								
112	0	2-YR PUBLIC	1294	2	INCREASE	0.0 %/YR				ADD INTO 0
		BASE 1	1294		2 1294		3 1294		4 1294	5 1294
113	0	4-YR PUBLIC	1752	2	INCREASE	0.0 %/YR				ADD INTO 0
		BASE 1	1752		2 1752		3 1752		4 1752	5 1752
114	0	UNIVERSITY PUBLIC	2398	2	INCREASE	0.0 %/YR				ADD INTO 0
		BASE 1	2398		2 2398		3 2398		4 2398	5 2398
115	0	TOTAL PUBLIC FTE ENROLLMENT								
116	0	PUBLIC 2-YR	0.0	6	0.0	122 1	0.0 123 0	0.0	0 0 0.0 0	ADD INTO 119
		BASE 1	35331		2 34044		3 34134		4 34132	5 34132
117	0	PUBLIC 4-YR	0.0	6	0.0	124 1	0.0 125 1	0.0	139 1 0.0 140	ADD INTO 119
		BASE 1	33970		2 33631		3 33597		4 33597	5 33597

LINE	CH	PLANNING ITEM	BASE	CODE	METHOD OF COMPUTATION	TOTALS
118	C	PUBLIC UNIVERSITY	0.0	6	0.0 125 1 0.0 127 1 0.0 141 1 0.0 142	ADD INTO 119
		BASE	1		2 3 4	5
		0	37490		37131 37774 37774	37774
119	0	TOTALS	0.0	1	TOTAL FROM OTHER LINES	ADD INTO 0
		BASE	1		2 3 4	5
		0	106792		104776 105505 105503	105503
121	C	FTE ENROLLMENT - UNDERGRAD				
122	C	AEC/PUBLIC 2-YR RESIDENT	0.0	6	0.0 24 2 0.01 24 0 0.0 0 0 0.0 0	ADD INTO 134
		BASE	1		2 3 4	5
		0	31497		30349 30429 30427	30427
123	C	PUBLIC 2-YR NON RESIDENT	3911	5	USER SUPPLIED DATA	ADD INTO 135
		BASE	1		2 3 4	5
		3911	3834		3695 3705 3705	3705
124	0	AEC/PUBLIC 4-YR RESIDENT	0.0	6	0.0 26 2 0.01 26 0 0.0 0 0 0.0 0	ADD INTO 134
		BASE	1		2 3 4	5
		0	25794		25438 25340 25340	25340
125	C	PUBLIC 4-YR NON RESIDENT	3264	5	USER SUPPLIED DATA	ADD INTO 135
		BASE	1		2 3 4	5
		3264	3175		3134 3122 3122	3122
126	C	AEC/PUBLIC UNIV RESIDENT	0.0	6	0.0 28 2 0.01 28 0 0.0 0 0 0.0 0	ADD INTO 134
		BASE	1		2 3 4	5
		0	28233		27663 28332 28332	28332
127	C	PUBLIC UNIVER NON RESIDENT	3233	5	USER SUPPLIED DATA	ADD INTO 135
		BASE	1		2 3 4	5
		3233	3141		3100 3086 3086	3086
128	C	AEC/PRIVATE 2-YR RESIDENT	0.0	6	0.0 30 1 0.03 30 0 0.0 0 0 0.0 0	ADD INTO 136
		BASE	1		2 3 4	5
		0.0	433.18		414.66 397.16 408.48	408.48
129	C	AEC/PRIVATE 2-YR NON RESI	0.0	6	0.0 31 1 0.03 31 0 0.0 0 0 0.0 0	ADD INTO 137
		BASE	1		2 3 4	5
		0.0	242.84		232.55 222.26 213.00	213.00
130	0	AEC/PRIVATE 4-YR	0.0	6	0.0 32 1 0.03 32 0 0.0 0 0 0.0 0	ADD INTO 136
		BASE	1		2 3 4	5
		0	6046		6114 6183 6253	6253
131	0	AEC/PRIVATE 4-YR NON RES	0.0	6	0.0 33 1 0.03 33 0 0.0 0 0 0.0 0	ADD INTO 137
		BASE	1		2 3 4	5
		0	4942		4997 5054 5112	5112

LINE	CH	PLANNING ITEM	BASE	EASE	CODE	METHOD OF COMPUTATION	TOTALS
132	C	AEC/PRIVATE UNIV RESIDENT	0	0.0	6	0.0 34 1 0.03 34 C 0.0 0 0 0.0 0	ADD INTO 136
		BASE 1	0			2832 2863 2894	2894
133	0	AEC/PRIVATE UNIV NON RES	0	0.0	6	0.0 35 1 0.03 35 C 0.0 0 0 0.0 0	ADD INTO 137
		BASE 1	0			1213 1232 1239	1239
134	0	TOTAL PUBLIC RESIDENT	0	0.0	1	TOTAL FROM OTHER LINES	ADD INTO 0
		BASE 1	0			85230 85681 85679	85679
135	0	TOTAL PUBLIC NON RESIDENT	0	0.0	1	TOTAL FROM OTHER LINES	ADD INTO 0
		BASE 1	0			9529 9913 9913	9913
136	C	TOTAL PRIVATE RESIDENT	0	0.0	1	TOTAL FROM OTHER LINES	ADD INTO 0
		BASE 1	0			9356 9439 9551	9551
137	0	TOTAL PRIVATE NON RESIDENT	0	0.0	1	TOTAL FROM OTHER LINES	ADD INTO 0
		BASE 1	0			6443 6509 6565	6565
138	0	FTE ENROLLMENT - GRADUATE					
139	C	PUBLIC 4-YR RESIDENT	1887	1887	5	USER SUPPLIED DATA	ADD INTO 147
		BASE 1	1887			1890 1900 1900	1900
140	C	PUBLIC 4-YR NON RESIDENT	3213	3213	5	USER SUPPLIED DATA	ADD INTO 148
		BASE 1	3213			3139 3235 3235	3235
141	0	PUBLIC UNIVERSITY RESIDENT	3952	3952	5	USER SUPPLIED DATA	ADD INTO 147
		BASE 1	3854			3886 4005 4005	4005
142	0	PUBLIC UNIV NON RESIDENT	2321	2321	5	USER SUPPLIED DATA	ADD INTO 148
		BASE 1	2262			2282 2351 2351	2351
143	0	PRIVATE 4-YR RESIDENT	67.00	67.0	5	USER SUPPLIED DATA	ADD INTO 149
		BASE 1	66.00			69.00 70.00 70.00	70.00
144	0	PRIVATE 4-YR NON RESIDENT	76.00	76.0	5	USER SUPPLIED DATA	ADD INTO 150
		BASE 1	77.00			77.00 78.00 79.00	79.00

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LINE	CH	PLANNING ITEM	BASE	CODE	METHOD OF COMPUTATION	TOTALS
145	0	PRIVATE UNIV RESIDENT	320.0	5	USER SUPPLIED DATA	ADD INTO 149
		BASE 1: 320.00	323.00		2: 326.00 3: 329.00 4: 332.00	5: 332.00
146	0	PRIVATE UNIV NON RESIDENT	283.0	5	USER SUPPLIED DATA	ADD INTO 150
		BASE 1: 283.00	286.00		2: 288.00 3: 292.00 4: 295.00	5: 295.00
147	0	TOTAL PUBLIC RESIDENT	0.0	1	TOTAL FROM OTHER LINES	ADD INTO 0
		BASE 1: 0	5743		2: 5776 3: 5905 4: 5905	5: 5905
148	0	TOTAL PUBLIC NON RESIDENT	0.0	1	TOTAL FROM OTHER LINES	ADD INTO 0
		BASE 1: 0	5374		2: 5421 3: 5586 4: 5586	5: 5586
149	0	TOTAL PRIVATE RESIDENT	0.0	1	TOTAL FROM OTHER LINES	ADD INTO 0
		BASE 1: 0.0	391.00		2: 395.00 3: 399.00 4: 402.00	5: 402.00
150	0	TOTAL PRIVATE NON RESIDENT	0.0	1	TOTAL FROM OTHER LINES	ADD INTO 0
		BASE 1: 0.0	363.00		2: 365.00 3: 370.00 4: 374.00	5: 374.00
151	0	UNDERGRD TUITION INCOME(000)				
152	0	PUBLIC 2-YR RESIDENT	0.0	6	0.0 2 3 0.0 122 3 0.01 0 0 0.0 0	ADD INTO 173
		BASE 1: 0	101736		2: 98027 3: 98285 4: 98279	5: 98279
153	0	PUBLIC 2-YR NON RESIDENT	0.0	6	0.0 3 3 0.0 123 3 0.01 0 0 0.0 0	ADD INTO 173
		BASE 1: 0	32780		2: 31592 3: 31677 4: 31677	5: 31677
154	0	PUBLIC 4-YR RESIDENT	0.0	6	0.0 4 3 0.0 124 3 0.01 0 0 0.0 0	ADD INTO 173
		BASE 1: 0	125361		2: 123629 3: 123154 4: 123154	5: 123154
155	0	PUBLIC 4-YR NON RESIDENT	0.0	6	0.0 5 3 0.0 125 3 0.01 0 0 0.0 0	ADD INTO 173
		BASE 1: 0	32289		2: 31872 3: 31750 4: 31750	5: 31750
156	0	PUELIC UNIVERSITY RESIDENT	0.0	6	0.0 6 3 0.0 126 3 0.01 0 0 0.0 0	ADD INTO 173
		BASE 1: 0	183234		2: 180832 3: 183874 4: 183874	5: 183874
157	0	PUBLIC UNIV NON RESIDENT	0.0	6	0.0 7 3 0.0 127 3 0.01 0 0 0.0 0	ADD INTO 173
		BASE 1: 0	51009		2: 50344 3: 50116 4: 50116	5: 50116

ANALYSIS OF PLANNING MATRIX STATE POLICY MODEL JUN 3, 1983

LINE	CH	PLANNING ITEM	BASE	CODE	METHOD OF COMPUTATION					TOTALS
158	C	PRIVATE 2-YR RESIDENT	C.C	6	0.0 E 3	0.0 128 3	0.01	0 0 0.0	0	ADD INTO 174
		BASE 1			2	3		4		5
		0 6800			6510	6235		6413		6413
159	C	PRIVATE 2-YR NON RESIDENT	0.0	6	0.0 9 3	0.0 129 3	0.01	0 0 0.0	0	ACC INTO 174
		BASE 1			2	3		4		5
		0 3812			3651	3489		3344		3344
160	C	PRIVATE 4-YR RESIDENT	0.0	6	0.0 10 3	0.0 130 3	0.01	0 0 0.0	0	ADD INTO 174
		BASE 1			2	3		4		5
		0 137855			139403	140975		142571		142571
161	C	PRIVATE 4-YR NON RESIDENT	0.0	6	0.0 11 3	0.0 131 3	0.01	0 0 0.0	0	ADD INTO 174
		BASE 1			2	3		4		5
		0 112684			113951	115241		116555		116555
162	C	PRIVATE UNIV RESIDENT	0.0	6	0.0 12 3	0.0 132 3	0.01	0 0 0.0	0	ADD INTO 174
		BASE 1			2	3		4		5
		0 67888			68611	69358		70106		70106
163	C	PRIVATE UNIV NON RESIDENT	0.0	6	0.0 13 3	0.0 133 3	0.01	0 0 0.0	0	ADD INTO 174
		BASE 1			2	3		4		5
		0 37707			29383	29657		30031		30031
164	C	GRADUATE TUITION INCOME(000)								
165	C	PUBLIC 4-YR RESIDENT	0.0	6	0.0 15 3	0.0 135 3	0.01	0 0 0.0	0	ADD INTO 173
		BASE 1			2	3		4		5
		0 9369			9374	9424		9424		9424
166	C	PUBLIC 4-YR NON RESIDENT	0.0	6	0.0 16 3	0.0 140 3	0.01	0 0 0.0	0	ACC INTO 173
		BASE 1			2	3		4		5
		0 31649			31923	32899		32899		32899
167	C	PUBLIC UNIVERSITY RESIDENT	0.0	6	0.0 17 3	0.0 141 3	0.01	0 0 0.0	0	ADD INTO 173
		BASE 1			2	3		4		5
		0 25012			25220	25992		25992		25992
168	C	PUBLIC UNIV NON RESIDENT	C.C	6	0.0 18 3	0.0 142 3	0.01	0 0 0.0	0	ADD INTO 173
		BASE 1			2	3		4		5
		0 36667			36991	38109		38109		38109
169	C	PRIVATE 4-YR RESIDENT	0.0	6	0.0 19 3	0.0 143 3	0.01	0 0 0.0	0	ADD INTO 174
		BASE 1			2	3		4		5
		0 1550			1573	1596		1596		1596
170	C	PRIVATE 4-YR NON RESIDENT	C.C	6	0.0 20 3	0.0 144 3	0.01	0 0 0.0	0	ADD INTO 174
		BASE 1			2	3		4		5
		0 1755			1755	1778		1801		1801

ANALYSIS OF PLANNING MATRIX STATE POLICY MODEL JUN 3, 1983

LINE	CH	PLANNING ITEM	BASE	CODE	METHOD OF COMPUTATION					TOTALS
171	0	PRIVATE UNIVERSITY RESIDENT	0.0	6	0.0 21 3	0.0 145 3	0.01	0 0	0.0 0	ADD INTO 174
		BASE 1	2		3		4			5
		0 7823	7895		7966		8041			8041
172	0	PRIVATE UNIV NON RESIDENT	0.0	6	0.0 22 3	0.0 146 3	0.01	0 0	0.0 0	ADD INTO 174
		BASE 1	2		3		4			5
		0 6926	6975		7072		7144			7144
173	0	TUITION INCOME - PUBLIC	0.0	1	TOTAL FROM OTHER LINES					ADD INTO 190
		BASE 1	2		3		4			5
		0 629111	619807		625286		625279			625279
174	0	TUITION INCOME PRIVATE	0.0	1	TOTAL FROM OTHER LINES					ADD INTO 191
		BASE 1	2		3		4			5
		0 384804	379710		383572		387604			387604
175	0	OTHER E&G INCOME (00)								
176	0	PUBLIC 2-YR	49338	2	INCREASE 0.0 %/YR					ADD INTO 182
		BASE 1	2		3		4			5
		49338 49338	49338		49338		49338			49338
177	0	PUBLIC 4-YR	16401	2	INCREASE 0.0 %/YR					ADD INTO 182
		BASE 1	2		3		4			5
		16401 16401	16401		16401		16401			16401
178	0	PUBLIC UNIVERSITY	39516	2	INCREASE 0.0 %/YR					ADD INTO 182
		BASE 1	2		3		4			5
		39516 39516	39516		39516		39516			39516
179	0	PRIVATE 2-YR								
180	0	PRIVATE 4-YR	59571	2	INCREASE 0.0 %/YR					ADD INTO 183
		BASE 1	2		3		4			5
		59571 59571	59571		59571		59571			59571
181	0	PRIVATE UNIVERSITY	65137	2	INCREASE 0.0 %/YR					ADD INTO 183
		BASE 1	2		3		4			5
		65137 65137	65137		65137		65137			65137
182	0	TOT PUBLIC OTHER E&G INCOME	0.0	1	TOTAL FROM OTHER LINES					ADD INTO 190
		BASE 1	2		3		4			5
		0 105255	105255		105255		105255			105255
183	0	TOTAL PRIV OTHER E&G INCOME	0.0	1	TOTAL FROM OTHER LINES					ADD INTO 191
		BASE 1	2		3		4			5
		0 124708	124708		124708		124708			124708

ANALYSIS OF PLANNING MATRIX STATE POLICY MODEL JAN 3, 1983

LINE	CF	PLANNING ITEM	BASE	CODE	METHOD OF COMPUTATION					TOTALS
184	C	STATE E&G SUBSIDY (000)								
185	C	PUBLIC 2-YR	0.0	6	0.0 112 3	0.01 116 0	0.0	0 0 0.0	0	ADD INTO 188
		BASE 1			2	3		4		5
		0 457195			440530	441694		441668		441668
186	C	PUBLIC 4-YR	0.0	6	0.0 113 3	0.01 117 0	0.0	0 0 0.0	0	ADD INTO 188
		BASE 1			2	3		4		5
		0 595162			588692	588627		588627		588627
187	C	PUBLIC UNIVERSITY	0.0	6	0.0 114 3	0.01 118 0	0.0	0 0 0.0	0	ADD INTO 188
		BASE 1			2	3		4		5
		0 899017			890405	905820		905820		905820
188	C	TOT STATE E&G SUBSIDY	0.0	1	TOTAL FROM OTHER LINES					ADD INTO 190
		BASE 1			2	3		4		5
		0 1951374			1919627	1936141		1936115		1936115
189	C	TOT INSTITUTIONAL REVENUES								
190	C	PUBLIC	0.0	1	TOTAL FROM OTHER LINES					ADD INTO 0
		BASE 1			2	3		4		5
		0 2665740			2644685	2666682		2666649		2666649
191	C	PRIVATE	0.0	1	TOTAL FROM OTHER LINES					ADD INTO 0
		BASE 1			2	3		4		5
		0 509512			504416	508280		512312		512312
192	C	PROJECTED COST BY SOURCE								
193	C	STATE	0.0	6	0.0 106 1	0.0 188 0	0.0	0 0 0.0	0	ADD INTO 197
		BASE 1			2	3		4		5
		0 2127703			2095956	2112470		2112444		2112444
194	C	FEDERAL	0.0	1	TOTAL FROM OTHER LINES					ADD INTO 197
		BASE 1			2	3		4		5
		0 337874			337874	337874		337874		337874
195	C	OTHER	0.0	6	0.0 107 1	0.0 182 1	0.0	183 0 0.0	0	ADD INTO 197
		BASE 1			2	3		4		5
		0 318127			318127	318127		318127		318127
196	C	FAMILY (TUITION ONLY)	0.0	6	0.0 173 1	0.0 174 0	0.0	0 0 0.0	0	ADD INTO 197
		BASE 1			2	3		4		5
		0 1013916			999517	1008858		1012884		1012884

APPENDIX B

STATE POLICY MODEL LINE DEPENDENCY MIX

BASE YEAR RUN

STATE POLICY MODEL LINE DEPENDENCY MATRIX

ITEM & LINE NO./INDEPENDENT VAR.	ITEM & LINE NO./DEPENDENT VAR.
Average Undergraduate Tuition, Public and Private, Resident and Non-Resident Lines 1-13	Average Undergraduation Tuition Income, Public and Private, Resident and Non-Resident Lines 161-173
Average Graduate Tuition, Public Public and Private, Resident and Non-Resident Lines 14-32	Average Graduate Tuition Income, Public and Private, Resident and Non-Resident Lines 174-182
	Line 183 Total Public Tuition Income
	Line 184 Total Private Tuition Income
Student Aid, Total number of Grants, Public and Private by Institutional Type Lines 44-51	Student Aid, Amount-Per-Student, Public and Private, Grants Lines 84-90
Student Aid, Total number of Loans, Public and Private by Institutional Type Lines 53-61	Student Aid, Amount-Per-Student Loans Lines 91-98
Student Aid, Total Dollars for Grants, Public and Private by Institutional Type Lines 62-68	
Student Aid, Total Dollars for all Public Grants Line 69	
Student Aid, Total Dollars for all Private Grants Line 70	
Student Aid, Total Dollars for Public and Private Loans by Institutional Type Lines 71-77	

ITEM & LINE NO./INDEPENDENT VAR.	ITEM & LINE NO./DEPENDENT VAR.
Student Aid, Total Public Loan Dollars Line 78	
Student Aid, Total Private Loan Dollars Line 79	
Student Aid, Total number of Grants and Loans, Public Line 80	
Student Aid, Total number of Grants and Loans, Private Line 81	
Student Aid, Total Public Dollars, Grants and Loans Line 82	
Student Aid, Total Private Dollars, Grants and Loans Line 83	
Student Aid, Percent of Student Aid that is Federal, State or Other in Public and Private Lines 112-114	
Student Aid, Total Amount that is Federal, State or Other in Public sector Lines 115-117	
Student Aid, Total Amount that is Federal, State or Other in Private sector Lines 118-120	
FTE Enrollment, Undergraduate and Graduate, Resident and Non-Resident, Public and Private Lines 131-160	Average Undergraduate Tuition Income, Public and Private Lines 161-173
	Average Graduate Tuition Income, Public and Private Lines 174-182
	Total Public Tuition Income Lines 183

ITEM & LINE NO./INDEPENDENT VAR.	ITEM & LINE NO./DEPENDENT VAR.
	Total Private Tuition Income Line 184
Other E&G Income, Public and Private Lines 185-183 State E&G Subsidy, Public Lines 194-198	
	Total Institutional Revenues, Public and Private Lines 199-201 Projected Costs by Source (State, Federal, Other and Family) Lines 202-206 Total Costs Line 207 Costs Percentages by Federal, State, Other and Family Lines 208-211 Percent of Revenues from Tuition, State, and Other Lines 212-217

APPENDIX C

STATE POLICY MODEL LINE-FLOW ANALYSIS

BASE YEAR RUN

STATE POLICY MODEL LINE-FLOW ANALYSIS

LINE NO.	ITEM	LINE(S) AFFECTED	ITEM
1-22	Undergraduate & Graduate Enrollment	161-184	Tuition Income
44-47	Student Aid, Total Number of Public Grants by Institutional Type	51	Total Number Public Grants
48-50	Student Aid, Total Number of Private Grants	52	Total Number Private Grants
51	Total Number of Public Grants	80	Total Number of Public Grants & Loans
52	Total Number of Private Grants	81	Total Number of Private Grants & Loans
53-56	Total Number of Public Loans by Institutional Type	60	Total Number of Public Loans
57-59	Total Number of Private Loans by Institutional Type	61	Total Number of Private Loans
60	Total Number of Public Loans	80	Total Number Public Grants & Loans
61	Total Number of Private Loans	81	Total Number of Private Grants & Loans
62-65	Student Aid, Total Dollars for Public Grants by Institutional Type	69	Total Dollars for Public Grants
66-68	Student Aid, Total Dollars for Private Grants by Institutional Type	70	Total Dollars for Private Grants
69	Total Dollars for Public Grants	82	Total Student Aid Public Dollars

LINE NO.	ITEM	LINE(S) AFFECTED	ITEM
70	Total Dollars for Private Grants	83	Total Student Aid Private Dollars
71-74	Total Dollars for Public Loans by Institutional Type	78	Total Dollars for Public Loans
75-77	Total Dollars for Private Loans by Institutional Type	79	Total Dollars for Private Loans
78	Total Dollars for Public Loans	82	Total Student Aid Public Dollars
79	Total Dollars for Private Loans	83	Total Student Aid Private Dollars
80	Student Aid, Total Number of Public Grants and Loans		
81	Student Aid, Total Number of Private Grants and Loans		
82	Student Aid, Total Dollars for Grants and Loans, Public		
83	Student Aid, Total Dollars for Grants and Loans, Private		
84-90	Student Aid, Amount-Per-Student, Grants, Public and Private	(Derived by dividing Lines 63-68 by Lines 45-50)	
91-98	Student Aid, Amount-Per-Student, Loans, Public and Private	(Derived by dividing Lines 72-77 by Lines 54-59)	
98-111	Student Aid Sources, Public		
112-114	Student Aid Sources, Private		

LINE NO.	ITEM	LINE(S) AFFECTED ITEM
115-120	Total Amount of Student Aid, Public and Private by Source (Federal, State and Other)	Line 115 adds into Line 204
131-143	FTE Undergraduate Enrollment for Public and Private by Resident and Non-Resident	
	132, 134, and 136	144: Total Public Resident
	133, 135, and 137	145: Total Public Non-Resident
	138, 140, and 142	146: Total Private Resident
	139, 141, and 143	147: Total Private Non-Resident
148-156	FTE Graduate Enrollment for Public and Private by Resident and Non-Resident	
	149 and 151	157: Total Public Resident
	150 and 152	158: Total Public Non-Resident
	153 and 155	159: Total Private Resident
	154 and 156	160: Total Private Non-Resident
161-173	Undergraduate Tuition Income for Public and Private Resident and Non-Resident students	(Lines 162-167 are derived by multiplying Lines 2-7 by Lines 132-137) (Lines 168-173 are derived by multiplying Lines 8-13 by Lines 138-143)
161-167		183 Total Public Tuition Income
168-173		184 Total Private Tuition Income
174-182	Average Undergraduate and Graduate Tuition Income for Public and Private sectors for Resident and Non-Residents	(Lines 174-184 are derived by multiplying Lines 15-22 by Lines 149-156)
183	Total Public Tuition Income	200 Total Public Institutional Revenues

LINE NO.	ITEM	LINE(S) AFFECTED	ITEM
184	Total Private Tuition Income	201	Total Private Institutional Revenues
185-191	Other E&G Income, Public and Private	192-193	Total Other E&G Income, Public & Private
192	Total Other E&G Income, Public	200	Total Public Institutional Revenues
193	Total Other E&G Income, Private	201	Total Private Institutional Revenues
194-197	State E&G Subsidy, Public	198	Total State E&G Subsidy
198	Total State E&G Subsidy, Public		
199	Title Card		
200	Total Public Institutional Revenues		
201	Total Private Institutional Revenues		
202	Title Card		
203	State Costs	(Derived by adding Line 116 and Line 198.) Yields Line 207, Total Costs.	
204	Federal Costs	(Derived by adding Line 115 and Line 118.) Yields Line 207, Total Costs.	
205	Other Costs	207	Total Costs (Derived by adding Lines 117, 120, 192, and 193.)
206	Family (Tuition Only)	207	Total Costs (Derived by adding Lines 183 and 184.)

LINE NO.	ITEM	LINE(S) AFFECTED ITEM
207	Total Costs	
208-211	Percent of Cost Share by Federal, State and Other	(Derived by dividing Lines 203-206 by Line 207.)
212-217	Percent of Public Revenues from Tuition, State and Other Sources	
212	Percent Public Revenues from Tuition	(Derived by dividing Line 183 by Line 200.)
213	Percent Public Revenues from Tuition	(Derived by dividing Line 183 by Line 200.)
214	Percent Public Revenues from the State	(Derived by dividing Line 198 by Line 200.)
215	Percent Public Revenues from Other	(Derived by dividing Line 192 by Line 200.)
216	Percent Private Revenues from Tuition	(Derived by dividing Line 184 by Line 201.)
217	Percent Private Revenues from Other	(Derived by dividing Line 193 by Line 201.)

VITA

Paul Richard Couey

Candidate for the Degree of

Doctor of Education

Thesis: A SIMULATION MODEL FOR ANALYSIS OF ALTERNATIVE FINANCIAL POLICIES AT THE STATE LEVEL

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