

Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.

**COMPUTERIZED FINANCIAL PLANNING
FOR SCHOOL DISTRICTS IN THE UNITED STATES**

**A thesis presented in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in Accountancy at
Massey University, New Zealand**

By

**LOIS MARIE GRAFF, CPA
B. S. (Bus), Miami University, Ohio
M. B. A., Baldwin Wallace College, Ohio**

March 1989

MASSEY UNIVERSITY LIBRARY



1061938446

© Copyright, Lois Marie Graff, 1989

All Rights Reserved

DECLARATION

I declare that "Computerized Financial Planning for School Districts in the United States" is my own work, that the work on which the thesis is based has not been accepted in whole or in part for any other degree or diploma, and that all sources that I have used or quoted have been indicated and acknowledged by means of complete reference.

Signed at Massey University, Palmerston North, New Zealand on May 1, 1989.

A handwritten signature in cursive script that reads "Lois Marie Graff". The signature is written in black ink and is positioned above the printed name.

Lois Marie Graff

ABSTRACT

This thesis presents the results of research to discover if and how computerized financial planning is conducted in United States school districts. The aim of the project was to assist school board members and administrators with financial planning and decision making. The methodology included a literature survey of long range business and academic planning, financial planning, financial models and modeling. It was concluded that long range financial planning has been successfully implemented in business and tertiary educational institutions and would be effective for school districts.

An integrated academic and financial planning model for school districts was normatively derived based on the literature. Primary planning variables reflecting academic policy decisions were identified, and tentative sub models for enrollments, staffing, and financial planning were described. Empirical work was conducted to fill "gaps" in the literature and gather descriptive evidence concerning the current state of financial planning and financial model design.

As part of the empirical work, questionnaires were sent to all school district treasurers (616) in the State of Ohio. More than forty percent (43.3%) replied. It was found that more than half of the respondents (54.5%) have long range financial plans, but few school districts (20.5%) conduct financial planning on computers. Of the districts operating computerized financial models, 68.5% use micro computers in preference to mainframes or minis. School district treasurers and superintendents take part in almost all financial planning and/or budgeting whereas school board members participate only occasionally. Most school districts (96.5%) recognize the need for long range financial planning and would consider using computerized financial planning models designed specifically for school districts. The research suggests that important barriers to computerized financial planning are lack of money and expertise to design models appropriate for school districts.

The integrated academic and financial planning model was computerized and tested by practitioners in the United States for completeness and usefulness. Changes were made to the model based on empirical work and field testing. The model is inexpensive, easy to use, and considered to be generic. It should prove helpful to school district decision makers.

ACKNOWLEDGEMENTS

My deepest thanks go to my supervisor Professor Michael J. Pratt for providing me with the opportunity to earn a doctorate and for encouragement and support throughout the entire program. Many thanks also to Dr. Rebecca Emery as co-supervisor. Mike and Becky were extremely generous with their time. They met regularly with me to offer incisive comments, constructive advice, and helpful recommendations. They assisted and encouraged me from the original proposal through countless drafts of the thesis. I was most fortunate to have expert advice from such outstanding people. I would not have embarked on this research without Mike or completed it without both Mike and Becky.

My thanks also to my colleagues and friends in the Department of Accountancy at Massey University. Their responsiveness when I sought their suggestions as well as their day to day cooperation and enthusiasm were irreplaceable. I will never forget them.

The assistance of Craig Gifford and John Brandt of Ohio School Boards Association, and Dr. Elise Jancura, my honorary overseas adviser from Cleveland State University, was vital during the weeks of research in Ohio. The cooperation and help of former colleagues who are still actively involved in school district finances, especially treasurers who answered the questionnaire, was invaluable. Thanks to all of you.

Lastly, and most importantly, I want to thank Richard, my beloved husband and best friend, who relieved me of all responsibilities at home so I could concentrate on this research. Together we have shared an exciting life and an extraordinary New Zealand experience.

PREFACE

Although this thesis was written while the author was a visiting lecturer at Massey University in New Zealand, spelling herein is American style. The topic dictated the style since the thesis will most likely be read more often in the United States than elsewhere.

References are listed at the end of each chapter. In addition, a bibliography is included which lists additional material which influenced this research but is not referred to in the thesis.

Although the author was originally discouraged by education experts from starting a doctoral research program based on a study of New Zealand schools' financial planning, this has become a very important issue in New Zealand since August 1988 with the publication of *Tomorrow's Schools, The Reform of Education Administration in New Zealand*. This document, written by the Rt. Hon. David Lange, Prime Minister of New Zealand and Minister of Education, recommends changing from complete control of school financing by the central government to financial decision making as close as possible to the source of implementation - the individual schools. While there are differences between school districts in the United States and schools in New Zealand as to sources of funds and some expenditures, it may be possible to apply some of the conclusions reached in this thesis and, perhaps, the model developed herein to financial planning for schools in New Zealand.

TABLE OF CONTENTS

	PAGE
ACKNOWLEDGEMENTS	iv
PREFACE	v
LIST OF FIGURES	xiii
CHAPTER 1 INTRODUCTION	
1.0 Introduction	1
1.1 Background of the Study	1
1.2 Significant Prior Research and Assumptions	4
1.3 Objectives and Hypotheses	7
1.4 Methodology	8
1.5 Scope and Limitations of the Research	9
1.6 Significance and Probable Results	10
1.7 Organization of Chapters	11
1.8 Summary	12
CHAPTER 2 ORGANIZATION AND FUNDING OF UNITED STATES SCHOOL DISTRICTS	
2.0 Introduction	16
2.1 Organization of School Districts	17
2.2 Organization of School Boards	19
2.3 Financial Pressures on School Districts	21
2.4 Fund Accounting	24

2.5	School District Revenues	24
2.5.1	Local Funds - Property Taxes	25
2.5.2	Local Funds - Other	27
2.5.3	State Funds	28
2.5.4	Federal Funds	29
2.6	General Fund Expenditures	29
2.7	Special Funds	31
2.8	Auditing Requirements	33
2.9	An Example: Ohio Uniform Account System for School Districts	33
2.9.1	Function and Object Codes	35
2.10	School District Accountability	36
2.11	School District Planning and Financial Planning: Inputs and Outputs	38
2.11.1	Requirements for a School District Financial Planning Model	39
2.12	Summary	40
2.13	Conclusions	41

CHAPTER 3 PLANNING, FINANCIAL PLANNING, AND FINANCIAL PLANNING MODELS

3.0	Introduction	45
3.1	Planning Defined	46
3.1.1	Time Horizons	47
3.2	The Planning Process	47
3.2.1	Corporate Planning	48
3.2.2	Educational Planning	49
3.2.3	Planning Models in Business and Education	56
3.2.4	Criticisms of Planning	58
3.3	Similarities and Differences	59
3.3.1	Business and Educational Institutions Compared	59
3.3.2	Tertiary Education and School Districts Compared	63

3.4	Financial Planning Models and Systems	65
3.4.1	Planning, Programming, Budgeting Systems (PPBS)	66
3.4.2	Zero Base Budgeting (ZBB)	69
3.4.3	Management Information Systems (MIS)	70
3.4.4	Decision Support Systems (DSS)	72
3.4.5	Executive Support Systems (ESS)	74
3.4.6	Other Financial Planning Systems	76
3.5	Financial Modeling	78
3.5.1	School District Financial Planning Variables	84
3.6	Summary	86
3.7	Conclusions	87

CHAPTER 4 A LITERATURE-BASED INTEGRATED FINANCIAL PLANNING MODEL FOR SCHOOL DISTRICTS

4.0	Introduction	94
4.1	Budgeting	96
4.2	Early Planning/Forecasting/Budgeting Models	97
4.3	Research Most Relevant to School District Financial Planning Models	98
4.4	An Overview of a Literature-Based Integrated Financial Planning Model for School Districts	104
4.4.1	Mission Statement	106
4.4.2	Long Term Goals and Objectives	106
4.4.3	Exogenous Factors	108
4.4.4	SWOT or SWOP Analysis	109
4.4.5	GAP Analysis	109
4.4.6	Strategies	111
4.4.7	Academic Plan	113
4.4.8	Financial Plan	113
4.5	Input-Output Analysis in Public School Education	114
4.6	Dynamic Planning	117

4.7	Literature Based Primary Planning Variables and Other Variables for an Integrated Financial Planning Model	117
4.7.1	Methods of Varying PPVs	129
4.8	Uncertainty	129
4.9	Optimization	130
4.10	Forecasting Exogenous Variables	130
4.10.1	Enrollment Forecasts	133
4.10.2	Enrollment Forecasts and Building Needs	134
4.11	Sub Models	135
4.11.1	Enrollment Forecasting Sub Model	135
4.11.2	Staffing Sub Model	139
4.11.3	Financial Planning Sub Model	143
4.12	Summary	146
4.13	Conclusions	147

CHAPTER 5 HYPOTHESES AND ANALYSIS OF RELEVANT EMPIRICAL RESEARCH

5.0	Introduction	154
5.1	Objectives and Hypotheses	155
5.2	Structure of Empirical Research	157
5.3	Interviews	158
5.4	Questionnaire	159
5.5	Other Empirical Research	163
5.6	Analysis of Questionnaire Responses by Hypotheses	165
5.7	Analysis of Questionnaire Responses by Objectives	176
5.8	Summary	181
5.9	Conclusions	181

CHAPTER 6 EMPIRICAL WORK RELATED TO DESIGN OF FINANCIAL MODELS AND DETAILED DESCRIPTION OF FINAL MODEL

6.0	Introduction	185
-----	--------------	-----

6.1	Analysis of Questionnaire Responses	186
6.1.1	Districts Which Use Computer Models	186
6.1.2	Number of Years Districts Have Used Models	187
6.1.3	Models Used for Decision Making	187
6.1.4	Purposes for Which Computers are Most Helpful	192
6.1.5	Initiators, Operators and Designers of Models	194
6.1.6	Administrators' Own Models	195
6.1.7	Statistical Techniques Used in Forecasting	196
6.1.8	Uncertainty	197
6.1.9	Computer Programs	198
6.2	Enrollment Forecasting Sub Model	199
6.3	Staffing Sub Model	203
6.4	Financial Planning Sub Model	205
6.5	Final Integrated Academic and Financial Planning Model	209
6.6	Summary	210
6.7	Conclusions	210

CHAPTER 7 TESTING THE INTEGRATED FINANCIAL PLANNING MODEL FOR SCHOOL DISTRICTS

7.0	Introduction	219
7.1	Methods of Testing the Model	220
7.2	Computerizing the Model	222
7.3	Analysis of Reviews	225
7.4	Refinement of the Model	232
7.5	Summary	232
7.6	Conclusions	233

CHAPTER 8 GUIDELINES FOR IMPLEMENTING THE COMPUTERIZED FINANCIAL PLANNING MODEL

8.0	Introduction	235
8.1	The Planning Schedule	236
8.2	Entering Data into the Model	238
8.3	Inputs to the Model	239
8.3.1	Birth Records and Past First Grade Enrollments	240
8.3.2	Survival Ratios	240
8.3.3	Personnel Data and Historical Receipts and Expenditures	241
8.3.4	Other Exogenous (External) Variables	241
8.3.5	Primary Planning Variables (PPVs)	243
8.3.6	Summary of Important Outputs	244
8.3.7	Changing Policy Decisions	244
8.4	Outputs of the Model	245
8.5	Summary	246
8.6	Conclusions	247

CHAPTER 9 SUMMARY AND IMPLICATIONS OF THE RESEARCH AND SUGGESTIONS FOR FURTHER RESEARCH

9.0	Introduction	248
9.1	Summary of the Research	248
9.2	Implications of the Research	250
9.2.1	Questions to be Considered	250
9.3	Suggestions for Further Research	257
9.4	Summary	259

APPENDICES

A.	Cover Letter for Questionnaire	261
B.	Questionnaire	262
C.	Thank You and Reminder for Questionnaire	267
D.	Letter to Associations of School Boards	268
E.	Answers to Questions Related to Hypotheses	269

F.	Letters, Instructions, and Evaluation Form For Testing	270
G.	Print Out of Model's Computer Screens	276
BIBLIOGRAPHY		285

LIST OF FIGURES

FIGURE NUMBER		PAGE
2-1	Typical School District Organization Chart	20
2-2	Property Tax Calculation	26
3-1	An Instructional Program Planning Model	55
3-2	A Comprehensive Strategic Planning Model	55
4-1	An Integrated Financial Planning Model	105
4-2	GAP Analysis Model	110
4-3	Example of Assessed Valuations of an Ohio School District	122
4-4	Forecasting Tax Receipts	123
4-5	Relationship of Sub Models with Integrated Model	136
4-6	Output of a Cohort Model	138
4-7	Staffing Model	140
4-8	Tentative Financial Planning Sub Model Format	144
5-1	Matrix of Hypotheses and Questions to Test Them	161
5-2	Responding School Districts by Size	164
5-3	School Districts with Financial Plans	165
5-4	Comparison of Size of Districts	166
5-5	School Districts With Computerized Plans	168
5-6	School Districts With Computerized Financial Plans Compared to Non Computerized and All Respondents	168
5-7	Size of Districts With Financial Plans	169
5-8	Size of Districts Without Financial Plans	169
5-9	Reasons for Not Using Computers for Financial Planning	171
5-10	Other Reasons Why Districts Do Not Use Computerized Financial Plans	173
5-11	School Districts Which Would Consider Using Computerized Financial Models	175

5-12	Participants in Financial Planning/Budgeting	177
5-13	Levels of Budgeting and Financial Planning	179
6-1	Districts Which Use Computer Models	187
6-2	Models Used for Decision Making	188
6-3	Purpose of Which Computer Models are Most Helpful	192
6-4	Dealing with Uncertainty	197
6-5	Methods of Forecasting Enrollments	200
6-6	Methods of Forecasting Number of Teachers Required	204
6-7	Number of Lines in Financial Planning Models	207
6-8	Integrated Academic and Financial Planning Model	212

COMPUTERIZED FINANCIAL PLANNING FOR SCHOOL DISTRICTS IN THE UNITED STATES

CHAPTER 1 INTRODUCTION

1.0 INTRODUCTION

This thesis presents the results of a study of computerized financial planning for school districts in the United States. The research constitutes a systematic, careful inquiry concerning the state of financial planning by school districts to discover if and how financial planning models are used and to identify factors which inhibit or advance the use of computerized models for financial planning. Then, a generic computerized model is developed to assist school district decision makers with the financial planning process.

This first chapter introduces the research and is arranged as follows:

- 1.0 Introduction
- 1.1 Background of the Study
- 1.2 Significant Prior Research and Assumptions
- 1.3 Objectives and Hypotheses
- 1.4 Methodology
- 1.5 Scope and Limitations of the Research
- 1.6 Significance and Probable Results
- 1.7 Organization of Chapters
- 1.8 Summary

1.1 BACKGROUND OF THE STUDY

School districts in the United States are controlled by elected or appointed school board members who set policy for the district. School boards hire superintendents to manage the day to day academic responsibilities and business administrators to provide service and support functions which usually include financial management (Jordan & Webb, 1986, p. 171). State

legislatures regulate primary and secondary education within their borders, determine how school districts may obtain resources and set minimum standards for the education of children and young adults (Campbell, Cunningham, Nystrand & Usdan, 1975, p. 50).

Providers of school district resources are local taxpayers, state legislatures and the federal government. School boards and their superintendents and treasurers are legally responsible for the raising and spending of school district resources (Campbell, et al., 1975, p. 357).

School districts throughout the United States, like other public agencies, have faced increasing demands for accountability. These demands have come from a variety of sources including minority and ethnic groups, feminist and other women's organizations, taxpayers, federal and state governments, teachers, parents and students (Campbell, et al., 1975, p. 51). Each group sees schools as vehicles for promoting different goals. Demands for quality in existing programs as well as for new programs have put pressure on school decision makers to plan expenditures carefully (Jordan & Webb, 1986, p. 173).

In addition to increasing demands for accountability, school districts have had to cope with resources which have been declining (Whetten, 1981, p. 91). One of the major reasons for this decline is the passage of legislation restricting the growth of taxes for schools. School districts in most states rely on property taxes for the majority of their funds (Dembowski, 1981, p. 92). The assessed valuation of the property to be taxed is therefore vital (Campbell, et al., 1975, p. 350). During the 1970s and 1980s property values rose so rapidly as the result of double digit inflation that many states put restrictions on the taxes which could be levied on property. The most visible of these "caps" on taxation was Proposition 13 in California (Jordan & Webb, 1986, p. 177). Passage of similar laws in other states has meant little or no growth in school revenues from taxes without a referendum vote.

Another pressure on the financial resources of school districts is desegregation legislation. Since 1954 many school districts have been under Federal court order to desegregate schools. These orders often include curriculum mandates in order to improve the quality of education for all pupils. The costs

associated with the implementation of these orders place a strain on district resources (Colton, 1977).

School districts face additional pressures as well. As Cibulka (1987) succinctly states

School administrators and board members have had to pay more attention to financial issues due to a combination of factors - enrollment decline, national economic downturns, loss of public confidence, and, in some cases, declining local economies (p. 7).

The primary planning tool for school districts is the school budget. It is the financial plan for attaining educational goals for a specific period of time, usually one year (Jordan & Webb, 1986, p. 179).

Long range planning is a tool which can help school boards manage their dwindling resources and respond to the pressures they face over a period of several years. It can enable school boards to determine their financial needs early enough to avoid crisis management. Martin (1987) believes that long range planning ensures the best utilization of available resources. He defines long range planning as

a process which allows an organization to rationally determine where it is, where it wants to go and how it will get there; one that identifies long-range goals and provides for the establishment of priority objectives through which resources are allocated to achieve those objectives on a predetermined schedule (p. 4).

Martin (1987) admits that long range planning is relatively new to school district management.

Resources can be allocated to attain organizational goals by integrating long range plans with long range financial plans (Cibulka, 1987, pp. 12-13). School districts should use the most advanced financial planning models in conjunction with long range academic goals to allocate resources most effectively (Martin, 1987, p. 4).

Long range financial planning models can also be used to demonstrate accountability for and efficient use of school district resources. This type of

planning can help school boards deal with the demands various constituents place on them (Whetten, 1981, p. 92).

While computer technology has helped school districts to keep up with the demands of state auditors and state boards of education for detailed financial reports, school administrators often do not have the time, the expertise or the money to develop computer models specifically related to school district long term financial planning (Jordan & Webb, 1986, p. 181). Such models can, however, be developed for micro computers (Milter & Rohrbaugh, 1985) and adapted to individual local school districts (Grafton & Permaloff, 1985, pp. 207-208).

1.2 SIGNIFICANT PRIOR RESEARCH AND ASSUMPTIONS

A literature survey related to educational planning, long range planning, budgeting, financial planning and computerized planning models as they pertain to education shows that there is a wealth of material about computerized planning for tertiary education. (See Harris, 1983; Hopkins & Massy, 1981; Kirschling, 1976; Plourde, 1976; Pratt, 1985; Sandin, 1977). The need for computerized long range financial planning models for school districts is discussed by Glose (1977, p. 239) who designed a non-computerized system. Later Cardinale (1981) developed a mainframe system for planning. Lee (1982) and Smith (1985) performed considerable research concerning the variables which can predict school district fiscal health. However, few long range financial planning computerized models for school districts are described in the literature.

Prior to designing a non-computerized long range financial planning-forecasting model for local districts, Glose (1977) surveyed school districts with enrollments of 10,000 students or less. The districts surveyed by Glose (1977) in New York State carried out little or no long range forecasting, but "the majority of the business administrators polled felt that their districts financial plans/forecasts should be developed five years into the future" (Glose, 1977, p. 86). In answer to other questions, respondents stated that for a financial model to be useful to local districts it should be:

1. inexpensive
2. uncomplicated
3. reliable
4. flexible yet structured
5. involve a minimum amount of time to operate
6. preferably non-computer oriented (p. 86).

Glose (1977) describes in detail seven models indicative of planning, programming, budgeting systems which have been designed for schools and school districts (pp. 48-55). Most of these models advocate using program budgeting instead of the more traditional line-item budgets (p. 50). Glose found little similarity between the actual planning practices observed in selected districts and the guidelines for planning he found in the literature. He observed that

although respondents do not plan they feel that the guidelines are valid and that they really should engage in more formal planning (p. 86).

Glose's survey was undertaken prior to 1977 before micro computers placed the necessary computing power into the hands of administrators of small and medium sized organizations (Grafton & Permaloff, 1985). This may explain the preference of Glose's (1977) respondents for models which were not computer oriented. Today, however, organizations

will often use microcomputers for analysis because mainframe and minicomputer accounting software often handle only traditional accounting functions. . . Even in business organizations that depend heavily on analysis, administrators have found themselves waiting weeks or even months for a central data processing department to perform analyses that could have been done in a few days or hours on a micro (Grafton & Permaloff, 1985, p. 203).

Cardinale (1981, pp. 35-36) discusses some reasons why many smaller individual school districts have not developed computer data processing departments. He concludes that while the cost of hardware is decreasing the cost of software is growing rapidly. Although many school districts own computer hardware, not much software is designed specifically for individual school districts, and the cost of development is too great for small districts. Cardinale (1981) designed a generic management information system model

which can be used by districts sharing a common computer and common software. The program runs on a mainframe computer using punched cards.

Some large city school districts have developed long range plans. One of the earliest was the Dayton, Ohio, school district which Jordon and Weaver (1972) discuss. The system used was a planning, programming, budgeting system designed specifically for educational organizations. The program requires all resource-consuming activities be tied to objectives and attempts to assign resources to predicted outcomes. The project collapsed under the weight of the volumes of data produced as each alternative of hundreds of programs was described.

A large city school district which has been more successful with long range planning is the Minneapolis, Minnesota, school district. The school board, under pressure from citizen groups, initiated a five year plan to begin in 1982. The plan is in response to changing educational, economic and demographic conditions. Plans include the organization of resources and finance. A planning coordinator was hired to oversee the project. Over the period of two years goals were adopted, specific objectives written and prioritized, and the plan was widely publicized. Updates of the plan are to be made at specified intervals to show which programs have been started, which are underway and which have been completed. Evaluations must also include suggested changes in the plan for the next five years. The cost of developing the plan itself was financed by the Minneapolis Chamber of Commerce. When the plan was completed, the school board could see a US\$98.6 M cumulative deficit over the five year period. Included in the plan were the closing of excess buildings and passage of an operating levy to address the deficit (Minneapolis Public Schools, 1982).

Although Minneapolis successfully implemented their five year plan, many large city districts have not developed any long range planning systems. Cibulka (1987) conducted case studies in 10 United States urban school systems - Atlanta, Baltimore, Boston, Chicago, Dallas, Los Angeles, Milwaukee, New Orleans, New York, and Seattle. After at least a decade of public pressure on most districts to improve their budgeting,

the most glaring and consistent deficiencies across systems were in the area of multi-year budget planning, goal setting, and revenue forecasting (p. 15).

Prior research shows that school districts of every size face the pressures and demands described in the background section of this chapter (Section 1.1), including the burden of declining resources. The response of large school districts to these pressures is mixed, but long range planning may enable some districts to take measures before a crisis develops (Cibulka, 1987). In the late 1970s Glose (1977) concluded that the cost of developing programs and the lack of administrator time to devote to the process were significant reasons for school districts planning no more than a year in advance. A few years later these same reasons - the cost in time and money - were again among the factors which deter some school districts from long range planning (Cardinale, 1981). Therefore, for the purposes of this study, the following assumptions are made:

1. Declining resources for school districts and increased demands by the constituents they serve create the need for additional resources.
2. School boards are accountable to the public for effective and efficient use of resources.
3. Greater use of long range financial planning and computerized financial planning models are likely to lead to more efficient use of scarce resources.
4. While financial decisions are not the most important ones which must be made by educational administrators and school board members, financial problems and financial disasters should not be allowed to disrupt the vital process of public education in the United States.

1.3 OBJECTIVES AND HYPOTHESES

The objectives of this research are to

1. determine if a significant number of school districts in the United States use computerized financial planning,
2. identify the factors which inhibit or advance the use of computerized long range financial plans,

3. adapt or develop a computerized financial planning model to assist school decision makers with long range financial planning.

Based on the literature search and in conjunction with these objectives, the following hypotheses are formulated:

1. Most school districts in the United States recognize the need for financial planning.
2. Few school districts use computerized financial plans.
3. The most important barriers to school district use of computerized financial plans are lack of money and expertise.
4. Most school districts which do not use computerized financial plans would consider using financial planning models if they were designed specifically for school districts in their state.

1.4 METHODOLOGY

The research methods to be employed to test the above hypotheses will be both descriptive and normative. They will include a search of the literature and empirical work.

Literature Searches

A thorough search of the literature pertaining to financial planning for education and applicable computer models is conducted and described in this study.

Additionally, a literature review concerning academic long range planning, politics, influences and pressures on school boards, and financing of school districts is included. Significant prior research related to school district financial planning is studied before empirical work is commenced.

Empirical Work

Empirical work is performed to test the hypotheses as stated above and to discover how models are being used currently. This work includes interviews with school decision makers and questionnaires to school district treasurers. At the same time, a survey of State Associations of School Boards is

undertaken to discover whether models are currently in use which have not been discussed in the literature. Additionally, a letter is sent to the National School Boards Association to solicit their help in the search.

In addition to testing the hypotheses, the empirical work should reveal any computer models which have been developed specifically for school districts. Then a generic financial planning model is designed to assist decision makers with long range financial planning in school districts.

The questionnaire method is used to obtain descriptions of models being used. Knowledge of what current models are designed to do, who participates in financial planning, and the decisions for which models are used assist the modeler in the development of a generic model.

School treasurers and other persons conversant with school decision making are asked to evaluate the model developed in Chapters 4 and 6. The model is computerized to assist the review process in Chapter 7.

Interviews are conducted with school district decision makers and state school officials to obtain information about models not otherwise discovered. The interviews add a richness of anecdotal information to the research.

1.5 SCOPE AND LIMITATIONS OF THE RESEARCH

While every effort has been made to discover and to develop models for micro computers, the author will not prescribe the "best" model(s) to use for all computerized financial planning by school districts in the United States. Models can assist but cannot replace human decision making.

Most of the empirical work will be conducted in the State of Ohio which has proved a good test venue for empirical work and study by other researchers (Christman, 1982; Cohen, 1983; Lee, 1982; Smith, 1985). School districts in Ohio have characteristics similar to those of many other states (see Chapter 5, Section 5.3) which suggest that similar results would be obtained in other

states. The generic model developed specifically for school districts in Ohio should be adaptable to most school districts in the United States and, possibly, to schools in other countries. However, change, uncertainty and new technologies outdate all systems and models over time (Cardinale, 1981, p. 7).

This research will not address the questions of equal protection or equitable distribution of educational resources. The effect on school district finances as a result of legislation similar to California's Proposition 13 will be mentioned but not discussed in detail. Funding of minimum standards of adequate basic education required by various states is not the topic of this research. In addition, there will be no discussion of methods by which individual states determine how funds are spent for public primary and secondary education nor the distribution of those funds, except as they affect individual school districts. These are very important questions for school administrators and school boards to study and to research. They all affect financial planning, but they are outside the scope of this research.

1.6 SIGNIFICANCE AND PROBABLE RESULTS

Recent journal articles have noted the decrease in educational funding and the need for school districts to use what resources are available in an efficient and effective way (Adams, 1980; Cibulka, 1987; Reynolds, 1982; Whetten, 1981). Accountability is the key word when public funds are being spent, yet little research has addressed the ways in which planning the allocation of resources can be used by small or medium size school districts to support requests for increased funding (Adams, 1980, p. 12; LaMorte & Williams, 1985, p. 84; Monk, 1984). Financial planning by individual school districts has been limited to annual budgets which are required by most states (Glose, 1977, p. 242). School administrators, however, cite the need for long range planning and financial planning models which are "parsimonious with respect to operating time and cost, uncomplicated, reliable" (Glose, 1977, p. 86). The model developed in Chapter 4 and refined in Chapters 6 and 7 is designed to meet this need.

The literature search and questionnaire are expected to prove that hypothesis 1 is true - that most school districts in the United States recognize the need for financial planning. The questionnaire will probably prove that the second hypothesis is also true - that few school districts use computerized financial plans.

Interviews with school board members and school administrators as well as the questionnaire should prove hypothesis 3 - that the most important barriers to school district use of computerized financial plans are lack of money and expertise. Hypothesis 4 should also be proved by the questionnaire - that most school districts that do not use computerized financial plans would consider using financial planning models if they were designed specifically for school districts in their state. Should the hypotheses prove to be true, they will demonstrate the need for the development of a generic financial planning model for school districts.

In addition to proving or disproving the hypotheses, the empirical work will also further the objectives of the research. The first objective - to determine if a significant number of school districts in the United States use computerized financial planning - is completed by proving hypothesis 2. The second objective - to identify the factors which inhibit or advance the use of computerized financial plans - is satisfied by questions relating to hypothesis 3. The third objective - to adapt or develop a generic model to assist decision makers with the financial planning process - is completed by the development of a model and the testing and evaluation of the model in Chapter 7. The need for the third objective depends upon the amount of support for the hypotheses.

1.7 ORGANIZATION OF CHAPTERS

Chapter 2 details the nature of school district financing, financial reporting, and financial planning and shows how these differ from similar activities in business organizations. Legal and political influences on resources and expenditures are also examined.

Chapter 3 is a search of the literature concerning planning, financial planning, and financial planning models in business, tertiary education and school districts. A theoretical foundation for modeling in education is established.

Chapter 4 features a literature survey of significant prior research in the area of school district financial planning and presents a literature based integrated financial planning model.

Chapter 5 states the hypotheses, provides a description of the empirical work undertaken, and presents an analysis of relevant original research.

Chapter 6 analyzes aspects of the empirical work related to model design and use and refines the model presented in Chapter 4 as the result of that research. The final model, which is based on the literature and original empirical work, is described.

Chapter 7 reports the results of testing and evaluation of the computerized model by school district treasurers and others.

Chapter 8 contains guidelines for the adaptation and implementation of the final generic financial planning model to individual school districts.

Chapter 9 summarizes the research conclusions, makes suggestions for further research, and completes the thesis.

1.8 SUMMARY

This chapter introduces the problem to be researched - computerized long range financial planning for school districts in the United States. The key assumptions upon which the research is based are explored. Hypotheses and objectives are given and their probable results discussed. The methodology to be followed is stated together with the scope and limitations of the research. The organization of the chapters and a brief explanation of their content completes the chapter.

REFERENCES

CHAPTER 1

- Adams, C.F., Jr. & Crampton, F.E. (1983). The fiscal impact of state aid to local schools. *Journal of Educational Finance*, 9(2), 157-170.
- Adams, E.K. (1980). *Fiscal response and school finance simulation: A policy perspective*. (Report No. F80-3). Denver, CO: Education Commission of the State. Education Finance Center.
- Campbell, R.F., Cunningham, L.L., Nystrand, R.O., & Usdan, M.D. (Eds.). (1975). *The organization and control of American schools*, (3rd ed.). Columbus, OH: Charles E. Merrill.
- Cardinale, O. (1981). On a generic management information system model with applications to public school systems. *Dissertation Abstracts International*, (University Microfilms No. AAD82-03949)
- Christman, L.H. (1982). *Streamlining local school budgeting in Ohio*. Cleveland, OH: Citizens' Council for Ohio Schools. (ERIC Document Reproduction Service No. Ed 233 457).
- Cibulka, J.G. (1987). Theories of educational budgeting: Lessons learned from the management of decline. *Educational Administration Quarterly*, 23, 7-40.
- Cohen, M.C. (1983). Tax capacity, tax effort, and state funding of schools in Ohio. *Journal of Educational Finance*, 9(2), 141-156.
- Colton, D.L. (1977). *Urban school desegregation costs part I, case studies*. St. Louis, MO: Center for Educational Field Studies. (ERIC Document Reproduction Service No. Ed147972).
- Dembowski, F.L. (1981). An inventory-theoretic approach to school district cash management. *Educational Administration Quarterly*, 17, 91-106.

(References continued - Chapter 1)

- Glose, G.P. (1977). A long range financial planning/forecasting model for local school districts. *Dissertation Abstracts International*, (University Microfilms No. AAD78-14000)
- Grafton, C. & Permaloff, A. (1985). Budget implementation with microcomputers. *Public Productivity Review*, 20, 202-212.
- Harris, D.E. (1983). *Representations of a harsh reality: The use of computer planning models in higher education*. Unpublished PhD thesis, Claremont Graduate School.
- Hopkins, D.S.P. & Massy W.F. (1981). *Planning models for colleges and universities*. Stanford, CA: Stanford University Press.
- Jordan, K.G. & Webb, L.D. (1986). School business administration. *Educational Administration Quarterly*, 22, (3), 171-199.
- Jordon, L.G., & Weaver, J.L. (1972). *Planning-programming-budgeting concepts applied to public school district financial management* (Order No. AD-741-409). Springfield, VA: National Technical Information Service (ERIC Document Reproduction Service No. ED0668 15).
- Kirschling, W.R. (1976) Models: Caveats, reflections and suggestions. *New Directions for Institutional Research*, 9, 1-11.
- LaMorte, M.W. & Williams J.D. (1985). Court decisions and school finance reform. *Educational Administration Quarterly*, 21, (2), 59-89.
- Lee, R. (1982). *Financial and staffing ratio analysis: Predicting fiscal distress in school districts*. Unpublished doctoral dissertation, Ohio State University.
- Martin, D.B. (1987). *Long range planning for school districts*. Westerville, OH: Ohio School Boards Association.

(References continued - Chapter 1)

- Milner, R.G. & Rohrbaugh, J. (1985). Microcomputers and strategic decision making. *Public Productivity Review*, 20, 175-189.
- Minneapolis Public Schools. (1982). *Five year plan for the Minneapolis public schools, 1982-1987*. Minneapolis, MN: Author. (ERIC Document Reproduction Service No. ED242817).
- Monk, D.H. (1984). The conception of size and the internal allocation of school district resources. *Educational Administration Quarterly*, 20,(1), 39-67.
- Plourde, P.J. (1976). Institutional use of models: Hope or continued frustration? *New Directions for Institutional Research*, 9, 17-33.
- Pratt, M.J. (1985). *Computerized support for financial planning in South African universities*. Unpublished doctoral dissertation, University of South Africa.
- Reynolds, D. (1982). School effectiveness research: A review of the literature. *School Organization & Management Abstracts*, 1, 5-15.
- Sandin, R.T. (1977). Information Systems and Educational Judgment. *New Directions for Institutional Research*, 15, 19-27.
- Smith, K. (1985). *Forecasting school district fiscal health*. Unpublished doctoral dissertation, Ohio State University.
- Whetten, D.A. (1981). Organizational responses to scarcity: Exploring the obstacles to innovative approaches to retrenchment in education. *Education Administration Quarterly*, 17, 80-97.

CHAPTER 2

ORGANIZATION AND FUNDING OF UNITED STATES SCHOOL DISTRICTS

2.0 INTRODUCTION

The purpose of this chapter is to explain how United States school districts are organized and funded. More specifically, it examines the organization of schools within states and some of the legal requirements and pressures imposed upon them. These pressures can be formidable since school systems in the United States are political entities of the state in which they are located. Each of the state legislatures regulates how schools within state borders are to be organized, determines how they are to be funded, and sets minimum academic standards, usually through state boards of education.

The funding of school districts is also discussed in detail. Revenues for the financing of individual school districts and limitations on the collection of taxes and other resources are set forth. Legal, contractual and political influences on expenditures are examined. The concept of fund accounting is introduced as the usual method of accounting for public resources. The State of Ohio uniform accounting system for school districts is shown as an example of a typical state-prescribed accounting system. Examples are given of some of the ways in which school boards are financially accountable to state boards of education, state auditors, the federal government and the public.

In addition, this chapter suggests that financial planning could be used as a tool which school districts might employ to identify financial problems, so they may be resolved before they become financial crises. Planning and financial planning are discussed in greater detail in Chapter 3. The educational production function of school districts and possible planning variables are discussed briefly in relation to financial planning for school districts.

The chapter is organized in the following sections:

- 2.0 Introduction
- 2.1 Organization of School Districts
- 2.2 Organization of School Boards
- 2.3 Financial Pressures on School Districts
- 2.4 Fund Accounting
- 2.5 School District Revenues
 - 2.5.1 Local Funds - Property Taxes
 - 2.5.2 Local Funds - Other
 - 2.5.3 State Funds
 - 2.5.4 Federal Funds
- 2.6 General Fund Expenditures
- 2.7 Special Funds
- 2.8 Auditing Requirements
- 2.9 An Example: Ohio Uniform Account System for School Districts
 - 2.9.1 Function and Object Codes
- 2.10 School District Accountability
- 2.11 School District Planning and Financial Planning: Inputs and Outputs
 - 2.11.1 Requirements for a School District Financial Planning Model
- 2.12 Summary
- 2.13 Conclusions

2.1 ORGANIZATION OF SCHOOL DISTRICTS

Free public education is provided for children and young adults from ages five or six to eighteen. It is organized from grades one through twelve in every one of the fifty states. Unlike tertiary education, which is voluntary, children must attend the public schools to which they are assigned until they complete the twelfth grade or are released by the proper authorities.

Most states are organized into school districts which are controlled by school boards composed of elected or appointed school board members. Hawaii is the only state which governs all of its schools as one district with only one school board. All other states have state boards of education as well as district

school boards. The local school district is, however, the basic administrative unit for the operation of schools. As the result of consolidating districts, particularly in rural areas, the number of school districts decreased from 16,790 in the 1973-74 school year to 15,821 in 1983-84 (National Education Association, 1984, p. 10).

School districts are agencies of the state in which they are located, and school board members are charged with setting policies for that district. Education is a government function, and school districts possess limited powers which are prescribed by the state. All school district policies must conform to the legal requirements of the state constitution and state legislature, and they are restricted as well by the United States Constitution (Baker, 1987, pp. 11-12).

Although school districts must cope with programs and guidelines enacted by state legislatures and state boards of education, school district decisions are still the basic ones in our public education system (Iannaccone & Lutz, 1970, p. 13). To make these decisions and to provide required educational programs, policies are adopted, personnel are hired, and decisions are reached by school board members in public meetings.

Unlike most school districts, large urban school districts such as Chicago and New York City sometimes require separate state legislation to deal with their problems. Chicago school district has 421,000 pupils and 594 schools, by far the largest district in Illinois. New York City School District, with nearly a million pupils and 950 buildings, has been having problems of governance for many years. These districts are sometimes exempt from the rules and regulations of their state legislatures and state boards of education because of their unique problems (Pipho, 1988). The problems of large districts receive a great deal of publicity, and they are the subject of many studies. Because of the diversity in size of school districts throughout the country, the relationship between district size and the allocation of resources has been researched (Monk, 1984). This current research will not address the problems of extremely large urban districts but will concentrate on financial planning methods suitable for small and medium-sized districts as well as moderately large city districts.

2.2 ORGANIZATION OF SCHOOL BOARDS

School board members are usually elected, though some are appointed, for specific periods of time, usually three or four years. Members are community representatives who are not necessarily education oriented. They may have sought membership on the board to represent a particular point of view concerning taxation, desegregation, union membership, bilingual education, vocational programs, or partisan politics (Iannaccone & Lutz, 1970). The board elects its own officers at an organizational meeting each year, and carries out its duties at public meetings. Board members have authority to act on school district affairs only while the board is in session, not as individuals between official meetings.

The main responsibilities of school boards include setting policies for the districts, raising funds to support schools, hiring superintendents and, in some states, hiring chief financial officers. School boards hire superintendents to carry out the policies of the district and to manage the day to day academic responsibilities. Business administrators are hired to provide support functions which usually include financial management (Jordan & Webb, 1986, p. 171).

To assist the boards and superintendents in carrying out the educational program, districts are often divided into attendance areas, with one school servicing each area. A principal is appointed by the school board to administer each school, and additional administrators are appointed for schools with large enrollments. In districts where the superintendent needs additional assistance, a school board may employ additional personnel such as assistant superintendents, a business or property manager, specialists in special and vocational education, curriculum and personnel administrators. The number of administrators depends mainly upon the size of the district. Size is determined by the number of pupils enrolled and/or the number of schools which must be serviced (Campbell, et al., 1975). Figure 2-1 shows the organizational chart of a typical school district.

School district organization is usually bureaucratic (Iannaccone & Lutz, 1970), and school boards are almost always under pressure to decrease the number of administrators and increase hiring of classroom teachers. While school

FIGURE 2 - 1

TYPICAL SCHOOL DISTRICT ORGANIZATIONAL CHART

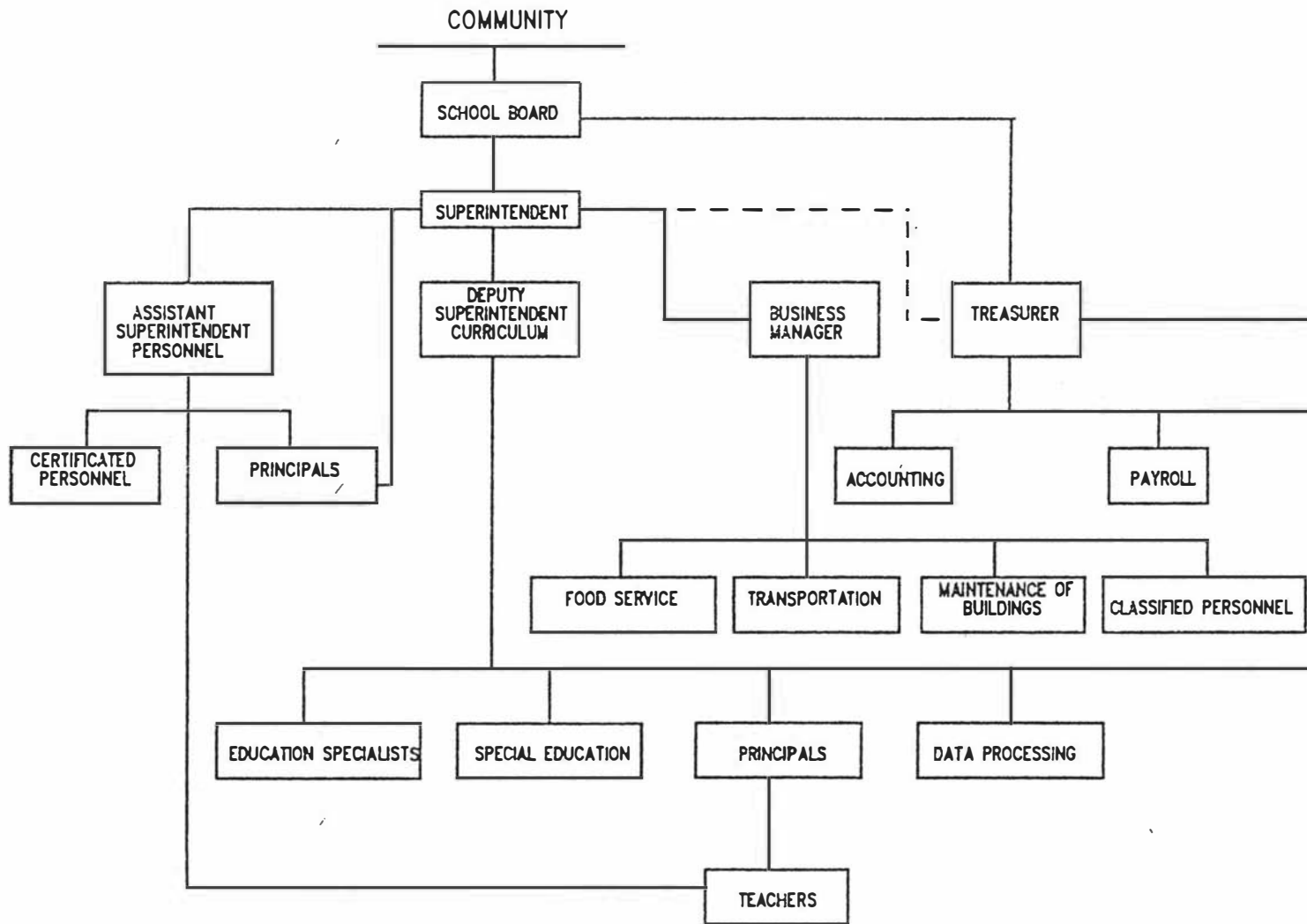


FIGURE 2-1

boards appoint administrators, evaluate their performance and set their salaries, they have an obligation to promote those who show the leadership qualities necessary for successful schools. On the other hand, they "should not hesitate to replace administrators who fail to lead" (Bell, 1988, p. 404).

In the State of Ohio the treasurer is the chief financial officer of the district and the only legally required non-academic administrator. Other business administrators may be hired, however, and held responsible for property management, data processing, purchasing, transportation, or cafeteria management. Large districts may even have budget managers or internal auditors.

There is a difference of opinion about school district involvement in financial and budget decisions. Some authors state that school boards have focused their attention on school business affairs to the detriment of academic programs (Bell, 1988, p. 404). Others say that "educators tended to treat budget administration as requiring no more specialized expertise than any other domain" (Cibulka, 1987, p. 15) and promoted former school principals to business administrators' positions. The consequence of such appointments made "the evolution of a strong budgeting division and the application of state-of-the-art financial management principles" the exception, especially in large city school systems (Cibulka, 1987, p. 15). This lack of financial expertise in many school districts has been recognized by the State of Ohio. In 1984 the state responded to the need for upgrading the professionalism and expertise of school business officials by requiring licensing of school district treasurers and school business managers. A university degree and experience in financial management are minimum requirements for the treasurers' licenses.

2.3 FINANCIAL PRESSURES ON SCHOOL DISTRICTS

Within legal parameters, most school boards seek to provide excellence, avoid uniformity, and tailor their programs to the needs of their students. Among the many pressures facing school boards, members often find themselves having to resolve conflicts between forces competing for diverse views of what

constitutes excellence or what the needs of the students really are (Iannaccone & Lutz, 1970).

School districts are often viewed as the "last stronghold of direct democracy in American public affairs" (Iannaccone & Lutz, 1970, p. 15). This romantic view of local education stems from the view that education is separate from government and is non political. This view persists even though the district is really an agency of the state and decisions must be made by board members in the public and, hence, political arena.

Over the past few decades school boards have been forced to address some of the following issues which will not go away. While negotiating associations or unions are rare among tertiary education organizations, teachers formed strong unions in many states during the 1960s, and collective bargaining in public primary and secondary education is now the rule rather than the exception. Teachers' salaries, which were extremely low in relation to those of other professionals, have increased dramatically. Federal District Courts in many states issued remedial orders, usually to large city school systems, to remedy the effects of *de jure* segregation in response to the U.S. Supreme Court decision in *Brown v. Board of Education of Topeka* (1954). This decision held that segregated schools violated the equal protection clause of the Fourteenth Amendment (LaMorte & Williams, 1985, pp. 61-62). The courts, however, provide no funds for the implementation of their orders with the result that state funds are diverted from other districts to carry out federal mandates in selected areas (Colton, 1977; Tutela, 1988, p. 11A).

State legislatures often require minimum standards in subjects which may not have been taught before in public schools, such as civics, health education, and vocational education (Campbell, et al., 1975). These mandates require school boards to spend additional funds to implement or improve programs at a time when many are facing declining enrollments and weak state and national economies.

The problems listed above are faced by school boards throughout the nation. Lack of financial support ranked number one as a major issue in the American School Board Journal/Virginia Tech survey of school board members in 1988,

as it has for the past six years. For purposes of this annual survey, the states are divided into six regions to compare trends nationally, and only one region did not list lack of financial support as the number one issue. The Southern Region listed lack of financial support as number two and state mandates as their first concern. State mandates, which is the third most pressing concern nationwide, is cited as one important cause of budget problems by school board members (National School Boards Association, 1988).

Unfunded state-mandated programs are a continual problem for all school districts. One state teachers' organization took out advertisements in newspapers throughout the state to publish their view that "schools across the state have been systematically underfunded" by their state legislature and stated that only 20% of the funds recommended by the State Board of Education were included in the state's 1987 education budget (Ohio Education Association, 1988).

At the same time, however, United States Education Secretary William J. Bennett was quoted as saying that taxpayers are "paying top dollar to educate our children, but we're sure not getting top return" (Brazaitis, 1988). He pointed out that states spent proportionally more on education in 1986 than in 1982 with the average expenditure per-pupil rising from 23.7% of national per capita income to 25.6%. The United States Education Department's 1988 survey showed spending for teachers' salaries amounted to roughly 41% of total spending for education nationally. In no State was spending for salaries more than half of the total funds spent. Secretary Bennett stated that the remainder, while some of it may be "well spent", is going to support educational bureaucracies (Johnson, 1988, p. 5D).

Another national educational leader, former United States Education Secretary Terrel H. Bell (1988), says that Congress and the state legislatures should establish a fund for education reform and renewal similar to the trust fund which enabled the building of interstate highways. He also wants to make the funds currently appropriated for education more productive by searching for ways to foster greater efficiency. In addition to his concern about the way funds are being spent, Bell recognizes that over-reliance on property taxes as a source of school funding has been a major obstacle to increasing local

funding. He recommends raising more funds at the state level so they can be distributed more equally to districts. His solutions focus on the role of the federal and state governments rather than on school districts, although he says that school boards must become more assertive and support administrators with leadership qualities (Bell, 1988, p. 404).

Secretary Bennett and former Secretary Bell are among the increasing number of citizens who are concerned about lack of financial support of schools. In a recent Gallup Poll the percentage of respondents who mentioned funding as a problem increased from 9% in 1985 to 14% in 1988. They ranked lack of financial support as number three following use of drugs (number one) and lack of discipline (number two). What was not measured, however, is whether or not this concern will be reflected by increased funding for schools or by additional pressure on school boards to spend what funds they have more efficiently (National School Boards Association, 1988).

2.4 FUND ACCOUNTING

Because of the diverse nature of school district operations, one fund is not sufficient to meet the legal requirements for accountability. Revenues and expenditures are therefore recorded and accounted for in a variety of funds (Jordan & Webb, 1986, p. 181). Revenues, expenditures and balances in these funds are maintained and reported separately. The largest fund is the general, or operating fund. Other funds which may be maintained are bond retirement, permanent improvement, building, student activity, food service, and private or parochial school funds. Most federal revenues and some state revenues are accounted for in separate funds. While the specific nature of these may differ from state to state and district to district, they are similar in kind.

2.5 SCHOOL DISTRICT REVENUES

School district revenues are classified by type and source for each of the various funds of the school district. For 1983-84, revenue receipts for all public

education funds in the United States were estimated at \$127.6 billion, an increase of 5.9% over the estimate for 1982-83. (Estimates are difficult to present because of the dilemma states face when trying to estimate the imputed value of surplus commodities distributed from school food programs by the federal government.) For the decade 1973-74 to 1983-84 total school revenues increased 124.4% at an annual rate of 8.4%. State legislatures have represented the largest source of total school funds nationwide since 1978 (49% in 1983-84). In many states, however, local and other sources continue to contribute well over half of the resources. For example, the State of Ohio contributed 54% of all school district resources in 1987. Receipts of federal funds increased from \$4.7 billion (8.3% of total funds) in 1973-74 to \$8.2 billion (6.4% of total funds) in 1983-84 (National Education Association, 1984, pp. 5, 7, 19-21). The following paragraphs will discuss in greater detail the most common sources of local, state and federal funds.

2.5.1 LOCAL FUNDS - PROPERTY TAXES

The study of local funding of schools is important because in 49 of the 50 states the local property tax levied on both private and business property is the main source of financing for public education, Hawaii being the exception. The value of property for taxing purposes is its assessed, or taxable, value. This value is usually determined as a percentage of the "true" value, also known as the sale or market value. For example, if property is assessed at 40% of true value, a property which could be sold for approximately \$100,000 would be assessed at \$40,000, and taxes would be levied only on the \$40,000 (Brandt, 1986).

Property taxes are computed by multiplying the assessed value of a property by the tax rate stated in mills. A mill is one-tenth of a cent. If the tax rate, or millage, in a school district is 20 mills, the school tax on property with a market value of \$100,000 would be determined as shown in Figure 2-2.

FIGURE 2-2
PROPERTY TAX CALCULATION

Market Value of Property	\$100,000
Assessment Rate of 40%	x .40

Taxable, or Assessed Value	\$ 40,000
Tax Rate of 20 mills	x .02

Tax Levied	\$ 800

During the 1970s when property values were rising very rapidly as the result of high inflation, many states passed legislation limiting the amount of tax which could be levied against property. The most well known of this kind of legislation are Proposition 13 in California and Issue 2 1/2 in Massachusetts. Some states accomplished the same goal of limiting taxes by giving credits which lowered property taxes to residents. These limitations were necessary to protect home owners from large increases in taxes as their residential property increased in value. The credits were not usually extended to business property. Unfortunately, the laws which protected taxpayers seriously eroded the growth in revenue to school districts from the property tax. Some state laws allowed for no increase at all in future years from the dollar amount a school district received the first year a levy was in effect. For example, a levy passed in 1978 to raise an additional \$1 million would still yield only \$1 million in 1988 although the purchasing power of the dollars had declined dramatically over the decade. Laws limiting tax receipts in this way mean no growth (rather than slow growth) in school revenues, except on new construction. These impediments to revenue growth force school districts to ask continually for new levies (Brandt, 1986, p. 13).

In Ohio and a few other states, an additional property tax for schools is levied on tangible personal property owned by businesses. The rate of taxation is the same as the general property tax, but limitations on the dollar amount which can be collected do not apply. This tax is collected by county treasurers and paid to schools districts twice each year with most of the tax being received in October, November, or December of each year. The amount of tax collected varies greatly from year to year, depending upon the health of business in each district. For districts which rely heavily on the personal property tax, uncertainty about the size of the tax collection and the date funds will be

received cause budget and cash flow problems (Christman, 1982). This particular tax is very unpopular with business organizations, especially as it relates to inventories. When sales are large, profits are usually good, inventories are low and, therefore, inventory taxes are low. When sales are down, profits are usually lower, and unsold inventories are large. Therefore, inventory taxes are higher when business income is lower. For this reason, business organizations often lobby state legislatures for lower tax rates, lower assessed valuations or the complete elimination of the personal property tax.

In addition to the property tax levies described above, both of which are for operating funds, school boards may place permanent improvement levies and bond issues on the ballot for a referendum. As the name suggests, permanent improvement levy proceeds may be used only for permanent improvements to school assets or property. These improvements are expected to last at least five years. Proceeds from bond issues may be used only to retire bonds or notes which the school board has sold to finance permanent improvements, usually construction and equipping of buildings. Receipts from permanent improvement levies or bond issues may not be used for day to day operations of school districts and are accounted for in funds other than the general fund (Brandt, 1986).

2.5.2 LOCAL FUNDS - OTHER

Other local receipts include fees, tuition (for summer school, early childhood education, special programs, adult education), rental of school facilities, sale of unneeded equipment, and earnings on inactive funds. These receipts are small in comparison to tax receipts and vary from district to district. In most states fees may be collected from students in public schools only for consumable supplies; all other costs of public education must be borne by taxpayers. Tuition is charged for pupils whose parents reside in another district and for programs offered to pupils outside regular school hours (Brandt, 1986). School facilities and equipment which are not needed for school purposes may be rented or sold. Proceeds from sale of school buildings must be used to pay off remaining debt, if any, from costs of construction. If all debts have been paid, the money may be used for permanent improvements, not for operating expenses. Proceeds from sale of unneeded equipment may go into the general fund.

The balance of money in all of the funds may be invested if it is not needed for current expenses. Each state determines the kinds of investments which it considers appropriate for inactive school funds. In Ohio, for example, the interest earned from investment of all fund balances, except private and parochial school funds, goes into the general fund. While arbitrage is not permitted, planned expenditures and judicious borrowing can enable a school district to increase its earnings on investment of inactive funds (Dembowski, 1981). Research has shown that this often overlooked source of revenue is one of the important indicators of school district fiscal health (Smith, 1985, pp. 133-134).

2.5.3 STATE FUNDS

Public education is, as previously mentioned, a state function. The states determine how schools are to be financed, and the states provide almost half of the funds to districts. Until 1971 the disparity in resources between districts within each state was acknowledged, but rarely addressed. The reason for this disparity was the financing of public education by the local property tax, as mentioned earlier. Because the assessed valuation of property per pupil varies between local school districts, so do tax rates, expenditure per pupil and quality of education. In 1971 the California State Supreme Court in *Serrano vs. Priest* (1971) attacked the property tax as the major source of school support. The court stated that poor districts could not provide quality education even with high tax rates while affluent districts could easily raise funds with lower rates. Finally, the court ruled that "Education may not be a function of wealth, except the wealth of the state as a whole" (Brandt, 1986, p. 33). Although the court did not find in this case that California's method of financing schools violated the state constitution, the major impact of the court's decision was to focus attention on the legality of unequal state educational funding in all of the states (Brandt, 1986).

Soon after the California decision, a Texas case challenging state educational funding methods was brought before the U.S. Supreme Court (*San Antonio Independent School District vs. Rodriguez*, 1973). The court did not find against the Texas system of reliance on the property tax but stated that the need for reform of financing public education was apparent. Since 1973 many

states have shifted some of the burden of school financing from the local districts to the state level as a means of equalization (Brandt, 1986, p. 34).

In addition to the "foundation" or equalization funds which states give to school districts (usually on some kind of a per pupil basis), "categorical" or special funds are also distributed by most states. These resources must be used only for the purposes for which they are granted such as vocational, special, or career education. Some categorical revenues may be part of the general fund, but usually they are accounted for as separate funds (Brandt, 1986, pp. 15-16).

2.5.4 FEDERAL FUNDS

Revenue from the federal government contributes only a small part of most school districts' financial support. Federal contributions are generally grants which are ear-marked for special use and are not usually a part of the general fund. (One exception is the inclusion of money which is received instead of surplus foods as part of a general fund food service account.) Since 1981 these revenues have been distributed by state boards of education. In almost all cases, a plan must be supplied to the state board of education before federal dollars are granted. Federal funds can supplement local revenues but must not supplant them (Brandt, 1986, pp. 17-19).

Some of the major federal education programs are Chapters 1 and 2 of the Education Consolidation and Improvement Act. Chapter 1 provides for the special educational needs of disadvantaged children. Chapter 2 combines into one block grant thirty programs which previously operated independently. Other federal programs are school food service, vocational education, and education of the handicapped (Public Law 94-142) (Brandt, 1986, pp. 17-19).

2.6 GENERAL FUND EXPENDITURES

School systems are essentially service organizations, and most of their expenditures are for personnel. Salaries, wages and fringe benefits account for between 80% and 85% of the average school districts' expenditures. While this percentage includes all personnel, most of the money is for teachers' salaries (Brandt, 1986, p. 22). The average United States teacher's salary in

1987 was \$26,551, up \$7,277, or 37.8% from the 1982 level. Average salaries in each state vary, however, from \$43,970 in Alaska to \$18,781 in South Dakota. Ohio ranked 22nd with the average teacher's salary at \$26,288. Fringe benefits, which may include retirement, hospitalization, sick leave, insurance and other benefits, are added to basic salaries and wages (Johnson, 1988).

While states legislate minimum salary and wage schedules, teachers' basic salaries and the salaries and wages of support personnel are often the result of negotiations between employees' representatives and the school board. The large percentage of expenditures for personnel highlights the responsibility of school boards in the area of decision making. Decisions which change curricula and the number of people needed to teach those curricula directly affect expenditures until priorities are changed again. State minimum standards or employee negotiated agreements may affect the number of persons who must be hired for a specified number of students for counseling, special education, libraries, or other specialized programs (Brandt, 1986, p. 26). Research has shown that since salaries and wages are the largest expenditure of school district funds

responsible officials should respect the absolute necessity of controlling staffing levels, negotiated salary agreements, and fringe benefit costs in order to maintain desirable fiscal health levels in their districts (Smith, 1986, p. 149).

The remaining 15% to 20% of annual school district expenditures which do not include personnel are for building operations (heat, light, maintenance, cleaning, etc.), textbooks, educational supplies, insurance, equipment, transportation, and other support services (Brandt, 1986).

Although building maintenance costs come from the general fund, a district which has a permanent improvement fund can relieve the general fund of the cost of large projects which will last at least five years. Maintenance, textbooks, educational supplies, and equipment are the most vulnerable areas when it is necessary to cut back expenditures. These expenditures, unlike heat and lighting, may be cut out of the budget for a year without closing the system down. However, neglected buildings and out-of-date textbooks and equipment may prove very costly to correct or replace when expenditures in

those areas are deferred for too long. Replacement and maintenance programs providing for regular expenditures over a period of time enable districts to avoid large commitments in any one year.

The large majority of schools districts transport pupils to school at public expense. States usually have a minimum transportation policy which can be expanded by the school district depending on its size and location. In some states students in private and parochial schools **must** be transported (in other states, districts **may** transport them) under the same conditions as public school pupils (Nelson & Purdy, 1974). Thus, transportation costs vary a great deal between districts within each state because of their policies as well as their geography. In urban and suburban districts, many of the children may walk to school. Older students may be encouraged to use public transportation where available. Rural districts may be forced to provide transportation to all pupils because of distance from school; others may transport for safety reasons. Transportation of special education students to centers where their special programs are offered has greatly increased transportation costs for most districts since passage in 1975 of federal legislation (Education for All Handicapped Children Act, P.L. 94-142) requiring specialized programs for handicapped pupils (Brandt, 1986, p. 19). While school districts usually pay for most of their transportation operating expenses, states often help to pay for buses. Some of the operating costs incurred as the result of state transportation mandates may also be reimbursed. As employee and other operating costs increase, some districts have subcontracted transportation of pupils in an effort to cut expenditures (Nelson & Purdy, 1974).

Some states allow districts to have a contingency account in the general fund for emergencies. In other states districts may allow for unexpected expenses by "padding" one or more expenditure accounts, especially if resources (tax rates) are based on estimated expenditures (Christman, 1982, pp. 13-14).

2.7 SPECIAL FUNDS

School districts can have any number of special funds, each designed to enhance one particular aspect of public education. Most states require that

districts receive permission to establish new funds and assign fund numbers. The purpose of this is to assist states when comparing one school district with others. As mentioned above, receipts and expenditures for each fund must be accounted for separately. Approved expenditures from special funds are usually determined before the fund is approved; therefore, the school board has little or no discretion about how the money should be allocated once the grant has been accepted and the fund established.

Unless a school district has paid in full for all of its buildings, a bond retirement fund is required. Receipts for this fund are the proceeds from bond issues passed for the construction of buildings. Notes or bonds are sold to pay for the buildings, and the fund is used to pay for interest and principal on notes and bonds outstanding. The tax rate for bond retirement is lowered annually as notes are repaid and bonds are retired. The tax rate is reduced further if the assessed value of property in the district has increased and will bring in more than must be expended from this fund in the coming year (Brandt, 1986, pp. 11-12).

Permanent improvement fund receipts result from the passing of levies for permanent improvements. Money is also deposited into this fund if buildings no longer needed for school purposes, but fully paid for, are sold. Since voters raised their taxes originally for the purpose of building permanent improvements, none of the proceeds of such a sale may be used for operating expenses without a court order. On the other hand, permanent improvements can be purchased with general fund monies (Brandt, 1986, p. 12).

Some school districts include food service receipts and expenditures in the general fund. As districts increase in size, however, many prefer to keep these in a separate fund. One of the chief reasons for a separate fund is to demonstrate clearly if food service is self supporting, earning a profit, or subsidized by the school district (Nelson & Purdy, 1974).

Some state and federal programs allocate educational funds to private and parochial schools as well as to public schools. This money can be used to provide special services and to purchase books, equipment, or supplies. Public school districts are required to administer all of these funds. The public

school districts hire personnel and purchase the goods requested by the private and parochial schools within their district to the limit of money provided for each school. Each of the state and federal programs is accounted for in a separate fund.

Student organizations often raise money, athletic events attract admission fees, and most school principals have discretionary monies from vending machines or other fund raising events. In some states, Ohio for example, all of these are collected and administered in separate funds by the district's treasurer. They are all considered public funds and can only be spent when appropriated by the school board.

2.8 AUDITING REQUIREMENTS

States differ in their requirements for financial reporting and auditing of school district accounts. Most states require that districts use some form of uniform accounting system, but not all states require an audit by an outside auditor. Federal funds have been audited in the past by the department of the government which originally authorized the grant, and some state auditors included federal funds as part of their state audit. For several years, however, The American Institute of Certified Public Accountants has been urging all states to require an annual single audit of all state and federal funds. Ohio has required a biennial audit of state funds in the past, but beginning in 1987 an annual single audit of all funds will be required of all districts in that state.

2.9 AN EXAMPLE: OHIO UNIFORM ACCOUNT SYSTEM FOR SCHOOL DISTRICTS

As stated above, accounting systems and requirements vary from state to state, but their similarities are greater than their differences. Receipts in all states except Hawaii are largely from local property taxes and from the state. Expenditures in all states are primarily for personnel. It is beyond the scope of this study to describe all of the accounting systems prescribed by each of the states. The Ohio uniform accounting system described below is an example of a typical system.

The Ohio State Auditor's office is concerned with the legal and financial aspects of school finance. State examiners from this office audit financial reports to determine that districts receive, borrow, appropriate, spend, repay, record and account for funds as they are legally required to do. The examiners' report is addressed to the school board, and action is taken to recover any funds not spent according to law. In addition to the audit function, the State Auditor's office monitors districts which have borrowed from the Emergency School Advancement Fund (ESAF). Districts are required to borrow from this fund as a last resort in order to keep operating (Smith, 1985, p. 2).

The State Board of Education is also concerned with the financial reports of school districts. The state board requires annual (SM1) and quarterly (SM2) cash flow reports which compare appropriated amounts with money expended. The concern of the State Board of Education extends beyond the financial aspects, however, and reports are required throughout the year showing details of how the district is meeting minimum standards. Districts also report, in detail, the expenditure of state categorical funds and their impact on educational programs.

Both the Ohio State Auditor and the Ohio Department of Education require that school districts account for receipts and expenditures using a prescribed account numbering system. Until 1986 all school districts in Ohio operated on a financial year ending December 31 and a school year ending June 30. Reports to the state auditor were by calendar year and to the state board of education by school year (Christman, 1982). Since June 30, 1986, districts end their financial and school years on June 30. They are required to prepare one annual report for both agencies containing all the information each requires. As mentioned above, accounting in Ohio school districts is on a cash basis; however, legislation has been passed by the state legislature which will require school districts to present financial statements on an accrual basis within the next few years (exact date of change depends upon the size of the district).

2.9.1 FUNCTION AND OBJECT CODES

In conjunction with the uniform accounting system, the State Auditor has assigned function and object codes for all expenditures. Each of the accounts shows the sum of more detailed accounts. Receipts are accounted for by source as shown in the first list of numbers below and are designated only by function codes.

1110	GENERAL PROPERTY TAX (REAL ESTATE)
1120	TANGIBLE PERSONAL PROPERTY TAX
1130	INCOME TAX
1190	OTHER RECEIPTS
1200	TUITION
1300	TRANSPORTATION FEES
1400	EARNINGS ON INVESTMENTS
1500	FOOD SERVICES
1600	EXTRACURRICULAR (STUDENT) ACTIVITIES
1700	CLASSROOM MATERIALS & FEES
1800	MISCELLANEOUS RECEIPTS FROM LOCAL SOURCES
1940	PROCEEDS FROM SALE OF NOTES
1900	OTHER REVENUE SOURCES (ALL OTHER 1900'S)
2000	RECEIPTS FROM INTERMEDIATE SOURCES
3110	SCHOOL FOUNDATION BASIC ALLOWANCE
3130	PROPERTY TAX ALLOCATION
3170	BUS PURCHASE ALLOWANCE
3000	RECEIPTS FROM STATE SOURCES (ALL OTHER 3000'S)
4000	RECEIPTS FROM FEDERAL SOURCES
5100	TRANSFERS-IN
5200	ADVANCES-IN
5300	REFUND OF PRIOR YEAR'S EXPENDITURES

Expenditures are accounted for by function code and object code. Function codes are listed first as follows:

1100	REGULAR INSTRUCTION
1200	SPECIAL INSTRUCTION
1300	VOCATIONAL INSTRUCTION
1400	ADULT/CONTINUING INSTRUCTION
1900	OTHER INSTRUCTION
2100	SUPPORT SERVICES - PUPILS
2200	SUPPORT SERVICES - INSTRUCTIONAL STAFF
2300	SUPPORT SERVICES - BOARD OF EDUCATION
2400	SUPPORT SERVICES - ADMINISTRATION
2500	FISCAL SERVICES
2600	SUPPORT SERVICES - BUSINESS
2700	OPERATION & MAINTENANCE OF PLANT SERVICES
2800	SUPPORT SERVICES - PUPIL TRANSPORTATION
2900	SUPPORT SERVICES - CENTRAL
3000	OPERATION OF NON-INSTRUCTIONAL SERVICES
4000	EXTRACURRICULAR ACTIVITIES
5000	FACILITIES ACQUISITION & CONSTRUCTION SERVICES
6000	DEBT SERVICE
7000	OTHER USES OF FUNDS

Object codes for each of the expenditure functions listed above are as follows:

100	PERSONAL SERVICES
200	EMPLOYEES' RETIREMENT/INSURANCE BENEFITS
400	PURCHASED SERVICES
500	SUPPLIES & MATERIALS
600	CAPITAL OUTLAY
700	CAPITAL OUTLAY - REPLACEMENT
800	OTHER OBJECTS
900	OTHER USES OF FUNDS

Each expenditure account number contains both function and object codes. Districts expand account numbers to include not only function and object but departments, schools or programs in order to record more detail for annual financial reports.

The school board uses the function and object codes to appropriate funds at the beginning of the financial year. This action authorizes the treasurer to spend district funds for the designated purposes. While appropriations are made by function and object, the annual and quarterly cash flow reports (Forms SM1 and SM2) sent to the state department of education show expenditures by object code only.

2.10 SCHOOL DISTRICT ACCOUNTABILITY

The financial statements mentioned above, which are required by the state auditor and state department of education, are public documents. As such they are accepted by the school board in public sessions and are published in local newspapers. These financial statements account for all local, state and federal funds.

States which require annual budgets may require a public hearing to be held before the budget is adopted by the school board. These budget hearings can be very political as pressure groups struggle to increase allocation of funds for particular programs. Budgets and appropriations must be passed by resolution of the school board before they become effective.

Regular reports are sent to the state and federal government, as mentioned above, which show in greater detail how special grants are spent and their impact on the educational program. Although these reports and the cash flow

reports are not usually published, they may be inspected by interested persons.

These reports, budgets, and audits demonstrate that school districts' expenditures are usually well monitored by both state and federal governments. These documents, however, are indicative of past events only. Decisions affecting the future are dealt with only when determining the following year's budgets. Failure to look beyond the annual budget suggests that school district decision makers concern themselves only with predicting what the next twelve or eighteen months will bring to the district. This short term budgeting has not succeeded in keeping school districts throughout the United States from facing fiscal disaster when expenditures exceed resources. Fiscal distress has been experienced by

school districts across the country from Boston, Massachusetts (1981) to San Jose, California (1983) because of imminent or actual closure due to lack of operating funds (Smith, 1985, p. 2)

The State of Ohio led the nation in school closures during 1976 and 1977 when twenty three districts were closed as the result of deficits. To prevent districts from closing schools in the future, a state loan fund was set up from which Ohio school districts are required to borrow to prevent deficits. This has prevented the closing of schools in Ohio but has not proved to be the answer for ensuring financially secure school districts. From 1978 through to 1983 101 loans were granted to 72 (12%) Ohio school districts which could not increase resources or decrease expenditures in time to avoid fiscal deficits. Other Ohio districts which faced problems during this same period of time (identified as having problems by their applying for, but then not needing, state loans) resolved their difficulties in time to prevent deficits by changing policies, cutting academic programs, reducing staff, and/or passing emergency levies (Smith, 1985 pp. 2, 5).

Few school boards would deliberately pursue policies which would lead to financial crises if they knew far enough in advance when deficits are likely to occur. While the closing of schools often leads to public outcry for greater accountability for school district resources, the real need is for forecasting of financial conditions further into the future. This would allow school districts to identify potential financial crises, demonstrate to voters the need for more

resources, and (if additional resources are not forthcoming in time to avert deficits) to borrow from the state, and/or cut programs to prevent closure of schools. Financial planning would allow school districts to choose policies which would achieve or maintain financial equilibrium (Smith, 1985, pp. 12-13).

2.11 SCHOOL DISTRICT PLANNING AND FINANCIAL PLANNING: INPUTS AND OUTPUTS

In systems terminology, inputs can be simply defined as what enters a system, and outputs are what leaves the system. The processes within the system determine the output; therefore, output of a system represents "the key to possible organizational changes within" the system (Van Dusseldorp, Richardson, & Foley, 1971, p. 4). For example, inputs to a public school district are pupils, teachers, buildings, and other support services. The output is educated pupils. The education pupils receive, unlike the profit motive in business, is very difficult to measure, especially in financial terms. Output of a system must be measured or evaluated in some way, however, or there will be no criteria on which to judge deficiencies in output. Without feedback to decision makers about deficiencies in output, it is likely that no changes will occur (Van Dusseldorp, et al., 1971, p. 4). There is a great deal of literature describing ways in which educational outcomes are measured. See Chapter 3 for detailed discussions of the research of Van Dusseldorp, Richardson, and Foley (1971) as well as that of Lewis (1983), Tanner (1971), and others.

Just as any model represents "a simplification of reality" (Van Dusseldorp, et al., 1971, p. 6), a financial planning model for school districts has limitations because of the difficulty of describing inputs and outputs in financial terms. While inputs can often be stated in financial terms (e.g. local tax receipts and state foundation receipts), educational outputs cannot easily be quantified in dollars and cents. However, a financial planning model can provide the opportunity for educational administrators to determine how to use available financial resources in ways that promote continued operation of schools. Financial planning models also allow decision makers to concentrate resources on programs which are most important for reaching educational goals. When expenditures must be adjusted, financial planning allows time for reductions in the number of teachers and/or other personnel which affect the

least important programs or services instead of forcing cuts across all programs regardless of their importance.

2.11.1 REQUIREMENTS FOR A SCHOOL DISTRICT FINANCIAL PLANNING MODEL

As stated above, the educational outputs of public schools are difficult to describe in financial terms. However, the purpose of financial planning for school districts is to help ensure schools remain in operation over the long term while providing opportunities for quality educational programs. The financial goal, therefore, is to end successive years with cash balances sufficient to keep the school district in operation. To achieve this goal, resources must increase each year to match increases in expenditures. This would enable school districts to achieve what Hopkins and Massey (1981) refer to as long-run financial equilibrium (LRFE).

For school districts in states where tax increases are dependent on taxpayer referendums, LRFE will often be difficult, perhaps impossible, to achieve. Legislation designed to protect home owners during periods of high inflation means that there is no longer significant annual growth in resources for many districts (section 2.5) although expenditures continue to increase. For most districts any increase in revenues depends on a referendum vote, and passing levies which increase property taxes is not usually an annual event. Therefore, the increase in resources from passing an operating levy must be large enough to keep a district solvent until the next levy can be passed. The financial goal for these districts could be to ensure that expenditures over a period of years will not exceed revenues over the same period of time. Publicizing the goal and forecasted receipts and expenditures of financial planning of this kind could serve to inform the community of the need for new levies every few years.

A school district financial planning model should provide school board members and administrators with the financial information they need to make decisions relating to academic goals and objectives, levy and bond issue receipts, staffing, salary and wage negotiations, building needs, support services, extracurricular activities, and other decisions. The model should reflect receipts and expenditures from the general fund only, since this is the largest fund, and the one over which the school board has the most control.

Other funds should be considered (for example, building and permanent improvement funds) only when expenditures from these funds replace expenditures from the general fund. A financial planning model for school districts should also be inexpensive, easy to use, and designed for micro computers (Glose, 1977; Grafton & Permaloff, 1985).

The inputs to a financial planning model might include several years of historical data aggregated into meaningful categories for decision making purposes. In the State of Ohio Uniform Accounting System for School Districts (section 2.9) for example, line item accounts could be aggregated by function and/or object. Input could also include estimates or forecasts of probable changes in enrollments, academic program, staffing, and support services in future years. These planning variables will be discussed in detail in Chapters 4 and 6. Models should allow for changes to be made easily to planning variables so that alternative projections of the future can be analyzed.

Output from a financial planning model should be financial forecasts based on different sets of assumptions. These forecasts should provide the information needed to identify financial crises far enough in advance to increase revenues or selectively reduce expenditures to prevent deficits.

2.12 SUMMARY

This chapter describes school systems in the United States, their organization and funding. School districts in the United States are described as political entities which are regulated by state legislatures. These legislative bodies define how schools are to be organized, determine how they are to be funded, and set minimum academic standards for all schools, usually through the state boards of education. School districts are governed by school boards.

Revenues for the financing of individual school districts and the limitations imposed on both receipts and expenditures are discussed. Legal, contractual and political influences are examined. Fund accounting is explained briefly. The State of Ohio Uniform Accounting System for School Districts is shown as an example of a typical state-prescribed school district accounting system.

This chapter also details some of the ways school boards are financially accountable to state boards of education, state auditors, the federal government and the community in which the district is located.

2.13 CONCLUSIONS

School districts recognize that they are accountable to the public; and annual reports and financial audits provide accountability for past expenditures. However, the literature suggests that few school districts engage in financial planning to ensure that schools will be financially operational more than a year into the future. School district financial planning is suggested as a way to help school districts remain in operation during difficult financial times.

School districts are political entities whose financial resources are determined largely by the states in which they are located and the public which they serve. Decisions relating to use of resources, however, are primarily determined by school board members and school administrators. Financial planning for several years into the future would provide school district decision makers with a tool to show the future financial effects of academic decisions and enable schools districts to identify and, perhaps, avoid deficits.

REFERENCES

CHAPTER 2

- Baker, R.T. (1987). *Handbook of Ohio school law*. Reprinted from text of Baker's *Ohio school law guide*. Cincinnati, OH: Anderson.
- Bell, T.H. (1988, February). Parting words of the 13th man. *Phi Delta Kappan*, 400-407.
- Brandt, J.M. (1986). Ohio school financial handbook (rev.) based on R.G. Stabile & P.E. Spayde, *What every Ohio citizen should know about school finance*. Westerville, OH: Ohio School Boards Association.
- Brazaitis, T.J. (1988, February 26). Bennett says schools lacking. *The Plain Dealer*, 13-A.
- Brown v. Board of Education of Topeka, 347 U.S. 483 (1954).
- Campbell, R.F., Cunningham, L.L., Nystrand, R.O., & Usdan, M.D. (Eds.). (1975). *The organization and control of American schools*, (3rd ed.). Columbus, OH: Charles E. Merrill.
- Christman, L.H. (1982). *Streamlining local school budgeting in Ohio*. Cleveland, OH: Citizens' Council for Ohio Schools. (ERIC Document Reproduction Service No. Ed 233 457).
- Cibulka, J.G. (1987). Theories of educational budgeting: Lessons learned from the management of decline. *Educational Administration Quarterly*, 23, 7-40.
- Cohen, M.C. (1983). Tax capacity, tax effort, and state funding of schools in Ohio. *Journal of Educational Finance*, 9(2), 141-156.
- Colton, D.L. (1977). *Urban school desegregation costs part I, case studies*. St. Louis, MO: Center for Educational Field Studies. (ERIC Document Reproduction Service No. Ed147972).

(References continued - Chapter 2)

- Dembowski, F.L. (1981). An inventory-theoretic approach to school district cash management. *Educational Administration Quarterly*, 17, 91-106.
- Glose, G.P. (1977). A long range financial planning/forecasting model for local school districts. *Dissertation Abstracts International*, (University Microfilms No. AAD78-14000).
- Grafton, C. & Permaloff, A. (1985). Budget implementation with microcomputers. *Public Productivity Review*, 20, 202-212.
- Hopkins, D.S.P. & Massy W.F. (1981). *Planning models for colleges and universities*. Stanford, CA: Stanford University Press.
- Iannaccone, L. & Lutz, F.W. (1970). *Politics, power and policy: The governing of local school districts*. Columbus, OH: Charles E. Merrill.
- Johnson, H. (1988, February 26). States' progress in public education slows down. *USA Today*, 1A, 5D.
- Jordan, K.G. & Webb, L.D. (1986). School business administration. *Educational Administration Quarterly*, 22, (3), 171-199.
- LaMorte, M.W. & Williams J.D. (1985). Court decisions and school finance reform. *Educational Administration Quarterly*, 21, (2), 59-89.
- Monk, D.H. (1984). The conception of size and the internal allocation of school district resources. *Educational Administration Quarterly*, 20(1), 39-67.
- National Education Association. (1984). *Estimates of school statistics, 1983-84 as provided by the state departments of education*. Washington, D.C.: Author, Research Division.
- National School Board Association. (1988). Money still is your top problem, but curriculum is making a big comeback. *American School Board Journal*. Washington, D.C.: Author.

(References continued - Chapter 2)

Nelson D.L. & Purdy, W.M. (1974). *School Business Administration*.
Lexington, MA: D.E. Heath.

Ohio Education Association. (1988, February). In support of increased State
funding of schools (Advertisement). Cleveland, OH: *The Plain Dealer*.

Pipho, C. (1988, February). Urban school districts and state politics. *Phi Delta
Kappan*, pp. 398-399.

San Antonio Independent School District v. Rodriguez, 411 U.S. 1 (1973).

Serrano v. Priest, 5 Cal.3d 584, 487 P.2d 1241 (1971).

Smith, K. (1985). *Forecasting school district fiscal health*. Unpublished
doctoral dissertation, Ohio State University.

Smith, K. (1986). Forecasting school district fiscal health. Dissertation
research. *Journal of Education Finance*, 12, (1), 140-153.

Tutela, A.D. (1988, February 15). Task undone, What Cleveland schools will
have to tackle next. *The Plain Dealer*, p. 11-A.

Van Dusseldorp, R.A., Richardson, D.E., Foley, W.J. (1971). *Educational
decision-making through operations research*. Boston, MA: Allyn and
Bacon.

CHAPTER 3

PLANNING, FINANCIAL PLANNING, AND FINANCIAL PLANNING MODELS

3.0 INTRODUCTION

This chapter surveys literature related to planning, financial planning and financial planning models. Long range planning and financial planning models have been designed for and are used in business and tertiary education where they have often proved to be successful for increasing profits and identifying, solving, or avoiding financial problems. While school districts in the United States have suffered declining enrollments and restricted resources similar to those affecting tertiary education institutions, it appears that long range planning has not been used extensively as a tool to solve school district problems. Long range planning is relatively new for school districts (Martin, 1987, p. 4). This chapter is arranged in several sections designed to build a theoretical base, derived from extant literature, for financial planning and modeling in school districts.

Building on this base, similarities and differences between business and educational administration philosophy and function, kinds of resources, and restrictions on expenditures will be described. The similarities between business and educational organizations suggest that financial planning, which has been shown to be successful in business, can be just as helpful to educational institutions. However, the goals of educational financial planning differ from those of business. This chapter discusses how these differences affect both the inputs and outputs of school district financial planning.

The chapter is arranged in the following sections:

- 3.0 Introduction
- 3.1 Planning Defined
 - 3.1.1 Time Horizons

- 3.2 The Planning Process
 - 3.2.1 Corporate Planning
 - 3.2.2 Educational Planning
 - 3.2.3 Planning Models in Business and Education
 - 3.2.4 Criticisms of Planning
- 3.3 Similarities and Differences
 - 3.3.1 Business and Educational Institutions Compared
 - 3.3.2 Tertiary Education and School Districts Compared
- 3.4 Financial Planning Models and Systems
 - 3.4.1 Planning, Programming, Budgeting Systems (PPBS)
 - 3.4.2 Zero Base Budgeting (ZBB)
 - 3.4.3 Management Information Systems (MIS)
 - 3.4.4 Decision Support Systems (DSS)
 - 3.4.5 Executive Support Systems (ESS)
 - 3.4.6 Other Financial Planning Systems
- 3.5 Financial Modeling
 - 3.5.1 School District Financial Planning Variables
- 3.6 Summary
- 3.7 Conclusions

3.1 PLANNING DEFINED

Planning is defined differently by different planners. Basically, planning is determining what a person or organization wants to do and deciding how to do it (Glose, 1977). The word itself brings responses of both support and skepticism. Planning was in vogue during the 1960s; however, world crises like the oil shortages and the revolution in Iran were not provided for, even though they had been widely forecast. As a result, planning as a discipline suffered a set-back. Planning today is concerned with choosing a path, or direction, with provision for contingencies (Brooke, 1984).

The starting point for direction setting is the mission statement or philosophy which defines the purpose of the organization, establishes strategic objectives, and formulates strategies to reach those objectives (Thompson & Strickland, 1984).

3.1.1 TIME HORIZONS

The time horizon used for planning depends on the kind of planning being addressed. Short term planning is used for daily or monthly activities, for operational decisions. Long term, or long range planning is concerned with trends and evolving events in the environment. There is no sharp division between short and long range plans (Gillenson & Goldberg, 1984, p. 47).

While the division between short and long range plans is unclear, the character of these plans differs.

Specificity is the characteristic of the short-term plan. It contains actions and their expected results and the relationships that the plan predicts will in fact come to pass. On the other hand, the long-term plan is characterized by breadth of view and preparation ... The long-term plan prepares us; the short-term plan directs us (Gillenson & Goldberg, 1984, p. 47).

The term "long range planning" means different things to different organizations. Over the years it has been known as strategic planning, five-year planning, goal setting, future planning, or management by objectives (Martin, 1987, p. 4). Glover and Holmes (1983) state that it covers a time span of ten to twenty years with short range being three to five years and middle range five to ten years (p. 9). Naylor and Thomas (1984) assume a five year planning horizon when describing resource allocation models (p. 2).

Hopkins and Massy (1981) use five years as the time span for their long range financial forecast (p. 33). They state, however, that medium range would be a better term. The school district PPBS models discussed later in this chapter have time horizons of three or five years, and Glose (1977) uses five years for his planning/forecasting model for school districts (p. 70). For the purposes of this research, any period of time three years or longer is considered as long range.

3.2 THE PLANNING PROCESS

The planning process and the importance of planning in business and education are discussed below.

3.2.1 CORPORATE PLANNING

Martz and Kami (1981) published a two volume work detailing in the first volume the steps a corporation can take to establish its own corporate plan and to monitor progress toward organizational goals. Volume II is a book of forms for recording and monitoring subunit goals and objectives. They state that the planning process begins by defining the corporate philosophy or mission and determining corporate goals and objectives. Subunit goals and objectives are integrated with the organizational goals, and planning takes place at all levels of the organization.

Brieve, Johnson and Young (cited in Glose, 1977, p. 41) note the difference between goals and objectives. They state that a goal is explicit; it is a statement of a desirable state which can be measured and is obtainable. An objective must relate to the goal, be measurable or observable, specify the criteria for desired performance and the period of time during which it should be achieved. As goals and objectives are approached, they should be revised and updated as necessary. These definitions agree with those of Martin (1987) in the context of school district planning.

Lynch and Williamson (1983, pp. 140-141) state that planning begins with establishment of the goals and objectives of an organization and proceeds to a financial plan for the allocation of resources to reach those goals and objectives. Their description of the process consists of (1) strategic planning, (2) management control, and (3) operational control. Others (Martz & Kami, 1981) prefer the word "monitor" because of the implication that a manager can(not) "control" the actions of subordinates.

Lynch and Williamson (1983, pp. 140-141) describe top management as being responsible for long range planning for all areas of the organization as well as setting basic objectives, and developing internal operations which take the external environment into account. Managers at all levels plan for the short to intermediate period and are concerned with internal operations. Their goals are tangible within the framework of overall objectives. Supervisors are responsible for planning the day to day operations of the organization (Lynch & Williamson, 1983, p. 141).

Brooke (1984) divides corporate planning into two phases - strategic and tactical. Strategic planning begins with a general review of possibilities and provides a direction for the company. The time period involved is from the beginning of a project until it begins to provide revenue. This period may range from two to thirty years depending upon the industry. Tactical planning is for a shorter period of time and involves steps the corporation can take to achieve the strategic plans. Increases in the technology of business organizations lengthen the decision making and planning horizons.

Decisions to begin a project may be good for the environment when they are made but when the time comes for implementation, which may be many years later, world conditions or technology may have changed (Brooke, 1984). While some enterprises manage to succeed without spending a great deal of time and effort on strategic planning, current research evidence points to strategy management and analysis "as having a positive impact on organization performance" (Thompson & Strickland, 1984, p. 41). As Ross and Kami state:

Without a strategy the organization is like a ship without a rudder, going around in circles. It's like a tramp; it has no place to go (cited in Thompson & Strickland, 1984, p. 41).

Corporate planning is the identification of options and opportunities open to a company and the recommendation of those which are most viable. Methods used vary from simple to sophisticated. Corporate planning may indicate a trend towards centralization. Often those who oppose centralization also oppose formal planning methods. However, corporate planning may also identify areas where responsibility can be delegated, and perhaps this should be considered as one of the purposes of corporate planning (Brooke, 1984).

3.2.2 EDUCATIONAL PLANNING

In the area of educational planning, Caruthers (1981) discusses master plans which he defines as the result of long or medium range formal planning of a tertiary institution. The time horizon is three to ten years. Other terms he uses for this type of plan are mission planning or institutional self-study.

The conditions necessary for successful master plans include:

1. determining readiness of the institution with positive attitudes and commitment of time and resources,
2. clarifying uses of the master plan,
3. organizing for self-study with sufficient staff,
4. determining participation and deciding participants' roles,
5. providing analytical support,
6. communicating, and
7. maintaining viability (Caruthers, 1981, pp. 22-27).

One of the more important tasks for planners is to monitor whether decisions are being made or whether they are being avoided. Easy answers are not necessarily wrong, but too many of them may constitute a pattern of decision avoidance. On the other hand, carefully worded ambiguous statements may signal non-decisions. If hard decisions are avoided by planners, the plan itself will not be worthwhile (Caruthers, 1981, p. 27).

Hopkins and Massy (1981) support the idea that educational institutions should plan because the problems are getting tougher, and financial constraints are getting tighter. The lack of sufficient planning can result in the following:

1. a tendency to concentrate on incremental income and expense on a year-by-year basis;
2. a tendency to deal with macro-parameters one at a time, often setting objectives or constraints on the basis of criteria that are stated in absolute terms rather than by assessing the tradeoffs among desirable (or undesirable) alternatives;
3. the difficulty with which the rationale of macro budget decisions are communicated to faculty, students, and even trustees (p. 25).

The literature contains few indications that primary or secondary school districts practice formal planning of any kind, yet they may derive the same benefits from planning, or suffer the same results from not planning, as tertiary educational institutions. Case studies have shown that some urban school districts show no signs of multi-year planning even when faced with declining enrollments and/or decreasing resources (Cibulka, 1987).

The principal planning tool for most school districts in the late 1980s remains the annual budget (Jordan & Webb, 1986, p. 179). As far back as 1944, however, the Council of Chief State School Officers listed ten guidelines for planning which Morphet, Jesser & Ludka considered relevant many years later (cited in Glose, 1977, p. 42).

1. The responsibility for leadership in planning the educational program properly belongs to and should be assumed by the regularly constituted educational agencies and authorities at the proper level.
2. The planning procedure and process should be carefully formulated, unified, and systematically carried out.
3. Educational planning should be recognized and carried out as an integral aspect of community, state, and national planning.
4. Definite provision for planning must be made in educational organizations in order that planning may proceed satisfactorily and attain tangible results.
5. One phase of educational planning should provide the basis for organized research. Another phase should be built on and utilize fully the results of research.
6. Educational planning must be thought of and established as a continuous process requiring constant adaptation of plans to emerging needs.
7. Educational planning to be functional must be realistic and practical but should not be needlessly limited by existing situations.
8. All educational planning should involve the active and continuing participation of interested groups and organizations.
9. The planning program should result in specific recommendations which are understood and accepted by those who are participating in the program.
10. Provision for continuing evaluation of the planning process is basic to the program (p. 42).

Changes in education over time mean some changes should be made to these basics of planning. The time horizon of planning should be multi-year, the entire enterprise should be coordinated, and the accent should be on innovation and modern educational management (Glose, 1977, pp. 43-44).

Martin (1987) lists twelve steps, paraphrased below, which he believes are necessary to develop a long range plan for school districts.

Step 1 Making the Commitment

Regardless of who decides that long range planning is a good practice for the school system, the superintendent and the board members must be committed to the value of the planning process. The subject should appear on the board meeting agenda, be discussed and voted upon in public.

Step 2 Pre-Planning

Pre-planning consists of reviewing planning models or programs keeping in mind that "there is no single, best long-range planning model!" A planning cycle (such as these 12 steps) and timetable should be determined. The opportunity for input into planning by outside persons and groups should be arranged for. A method of evaluation and reporting should be decided upon, and terms such as "goal", "objective" and "long range planning" should be defined.

Step 3 Selection of Planning Categories

Units or categories for planning should be identified such as Curriculum, Support Services, Transportation, Community Relations and Personnel. Each goal should fit logically into one of the planning categories.

Step 4 Soliciting Input

While staff will be involved in long range planning from start to implementation, it is important to find out what the public expects of schools and give the public a sense of ownership of the plans.

Step 5 Developing Goals

This involves the setting of goals for each of the various activities included in the planning categories. This task may take months to complete. Goals are general and timeless. Unlike objectives, once written goals undergo little change.

Step 6 Identifying Existing Programs

Programs currently in operation which help to achieve a goal should be identified and recorded.

Step 7 Recording Potential Objectives

Objectives should be recorded regardless of when they are suggested. When goals are updated each year, objectives will rise or fall on their own merit.

Step 8 Developing Objectives

The superintendent and staff arrive at cost estimates for key proposals and present the board with objectives recommended for adoption. Objectives have both costs and time deadlines attached.

Step 9 Coordinating With Budget Process

Certainly any objective requiring additional staff, equipment or supplies must be considered and approved in conjunction with

action on the budget. However, long range plans must be flexible enough to allow for new situations and changing priorities.

Step 10 Reporting Progress

Progress reports must be made at regular intervals to the board and to the public.

Step 11 Coping With External Factors

Change must be anticipated. "A key to successful planning is the firm understanding that if the situation changes or if unusual circumstances arise, the plan will be altered to accommodate the change." (p. 21).

Step 12 Evaluation

The evaluation method should be determined when an objective is adopted. Both subjective and objective measures may be used (p.23).

Glose (1977) adds "feedback" as an important part of the school district planning process and summarizes the pertinent activities as follows:

Preplanning - This stage involves leadership, knowledgeable personnel, awareness of resources, and process-guiding policies and procedures.

Goals and Objectives - Development of these is continuous and includes considering variables both known and unknown, controllable and uncontrollable.

Data Collection - Useful and accurate data must be gathered.

Implementation Strategies - Response to strategy adaptation can be programmatic, adaptive, or creative but must satisfy criteria stated in the objectives.

Evaluation and Recommendation - The selection process blends systematic evaluation with judgment over a range of criteria.

Feedback - This is essential to keep decision makers informed through the continuous process (pp. 40-48).

While virtually all school districts engage in some parts of the long range planning process, very few engage in all of them. However, the districts with a plan are likely to be better managed than those without one (Martin, 1987, p. 23).

Of the forty State Boards of Education which responded to a survey about state-mandated long range planning in the early 1980s (Lewis, 1983, p. 1), fewer than one-third (14) required any kind of long range planning by school

districts. School districts which are required to submit long range plans tend to use some variation of an instructional program planning model, an example of which is shown in Figure 3-1. Since few school districts try to forecast the future, "most long-range plans are established as though the future were going to be like the present" (Lewis, 1983, p. 119). Contrasting with this model is a more comprehensive model (Figure 3-2) which attempts to consider the external environment as well as the internal environment in the planning process. The comprehensive model is recommended because "it is more likely that change will occur externally than internally" (Lewis, 1983, p. 120).

Lewis (1983) lists the following three types of planning assumptions (or variables) which should be determined, or forecast, to set the stage for planning:

Noncontrollable Planning Assumptions

- * Rising or declining student enrollment
- * Local, state, and federal legislation
- * Economic factors
- * Increase or decrease in funding level
- * Political environment

Semi-controllable Planning Assumptions

- * Character of staff turnover
- * Staff salaries and fringe benefits
- * Direction of the school
- * Method of appraising performance
- * Projected budget increase or decrease

Controllable Planning Assumptions

- * Instructional program
- * Textbook and materials allocations
- * Purchase of equipment, furniture, and the like
- * Superintendent edict
- * District-wide goals and objectives (p. 88)

Planning assumptions must be clearly stated, prioritized, recorded, tracked continuously, and updated regularly. These assumptions form the basis for both short and long range planning in all areas. For example, based on these assumptions "financial strategies should include such areas as the sale or disposition of unusable buildings; acquiring local, state, and federal grants; school budget; expenditure on facilities; interest income investment; and financing special projects" (Lewis, 1983, p. 111).

FIGURE 3 - 1
AN INSTRUCTIONAL PROGRAM PLANNING MODEL

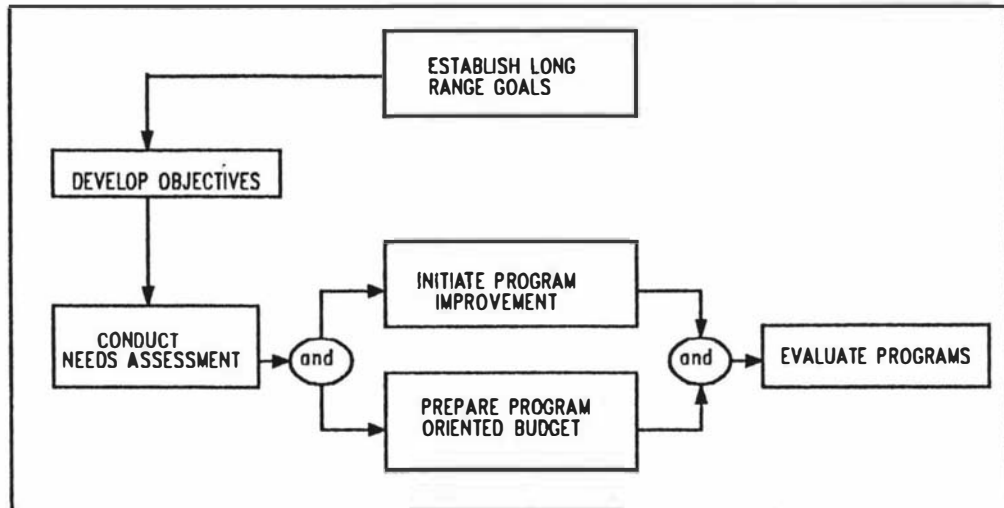
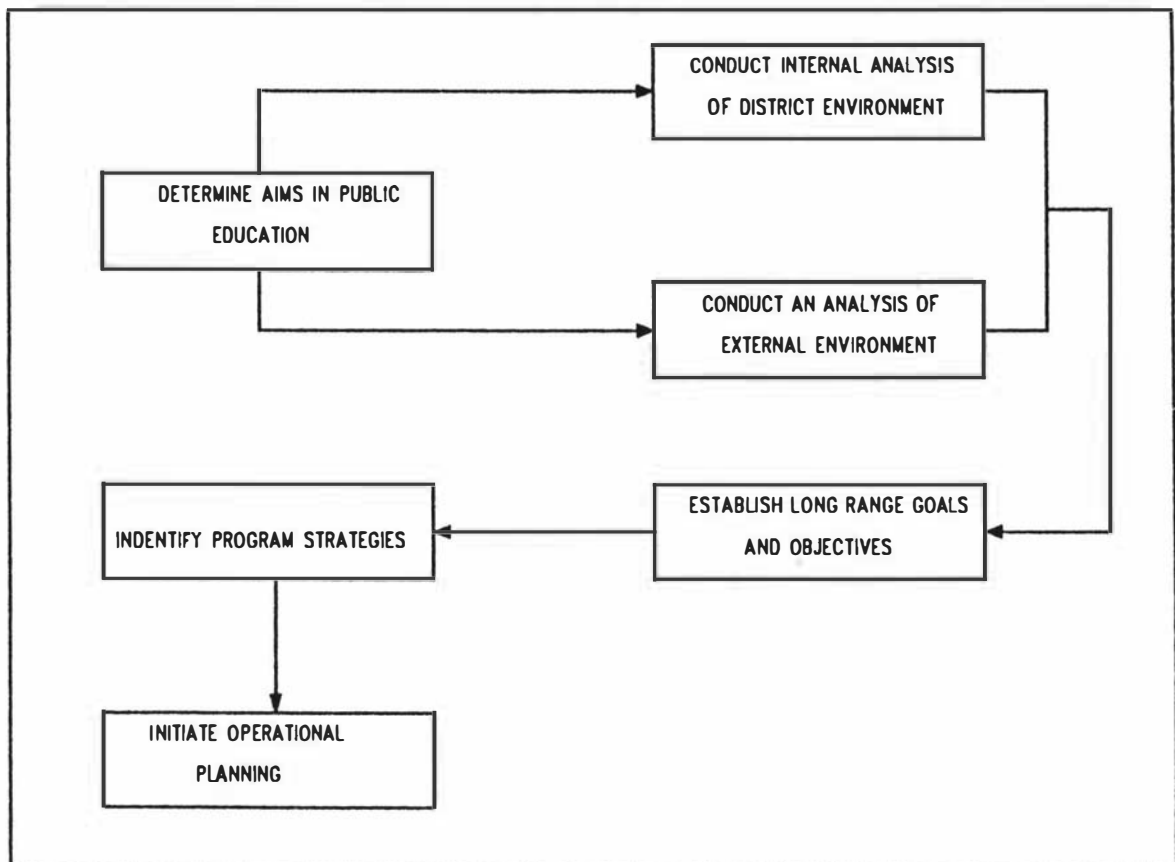


FIGURE 3 - 2
A COMPREHENSIVE STRATEGIC PLANNING MODEL



One of the ways to introduce the planning process to a school district is to develop a planning manual which provides training guidelines, stimulates action, consolidates planning efforts, and serves as a communication tool. It also explains the planning concept and sets standards for evaluating plans. It may take several planning cycles and several updates of the planning manual before the manual meets the individual requirements of a school district (Lewis, 1983, pp. 238-242).

3.2.3 PLANNING MODELS IN BUSINESS AND EDUCATION

Models are designed for several purposes - to increase understanding of a process, for teaching or learning, to improve a decision, or to satisfy curiosity (Hopkins & Massy, 1981, p. 4).

Planning models are usually quantitative, but they may contain descriptions of information flows, personnel interrelationships, or designs. However, since planning usually precedes some kind of resource allocation, numerical models predominate. Planning/budgeting models will be discussed under the financial planning section 3.4. Model building or modeling will be discussed in section 3.5.

One example of a popular planning model which is not quantitative and is used in business and education is Management By Objectives. Management By Objectives (MBO) uses goals throughout a system to manage, motivate, control and reward employees for their actions and behavior. Lewis (1983, pp. 125-127) describes and recommends the benefits of MBO for school districts. One of its best properties is its "conceptual clarity - it is superficially unambiguous" (Bromiley & Euske, 1986, p. 316). However, empirical assessment has indicated some weaknesses.

Bromiley and Euske (1986) consider one of the weaknesses is that strict adherence to MBO may be counter productive. Very detailed, rigid objectives may stifle innovation and long term building of the organization.

In short, the rational planning made inherent in many MBO systems can be dysfunctional. Differing applications could severely constrain mid-level managerial freedom and creativity, force rational and consistent organizational progress toward inappropriate ends, misdirect managerial incentives and even force

an involuntary 'work to rule' as defined through the financial management system (Bromiley & Euske, 1986, p. 316).

Their concern with the effect of MBO on the overall goals of the organization leads Bromiley and Euske (1986) to suggest that MBO may be useful for part of the organization rather than using it throughout. Cuthbert (1981) agrees that an approach is needed which is sufficiently specific to provide guidelines for management but which allows for managers to use their discretion when making decisions.

Traditional planning assumes organizations which are tightly coupled (1) by processes and products, (2) by organizational units, and (3) across organizational levels. "The sequential connectedness of goals, programs, actions, and outputs - or problems, solutions, and decisions - is integral to such technical systems as MBO or PPBS (planning, programming, budgeting systems)" (Clark, 1981, p. 50). The success or failure of one unit affects all others, and the interdependency of units or individuals suggests agreement that organizational goals transcend all other goals. Cumulation across hierarchical levels allows for the emergence of "supra-goals" (p. 50).

Recent studies indicate that educational organizations do not often exhibit the tight coupling described above (Clark, 1981). To achieve the flexibility needed to allow programs like MBO to work in educational settings, the following improvements are suggested:

1. Loosen the connections between subunits within the organization. The organizational planning group should be loosely coupled with most parts of the organization.
2. Employ the technology of "foolishness", that is, allow flexibility for managers to undertake activities without proof that they will work, and evaluate their usefulness after the fact. Encourage the use of intuition.
3. Keep objectives general by identifying the direction of improvements, not specific items (Bromiley & Euske, 1986, pp. 316-318).

While Lewis (1983, p. 124) advocates the use of MBO in his description of the process for developing operational plans in school districts, there is no

evidence in the literature that school districts are currently using this kind of planning technique.

3.2.4 CRITICISMS OF PLANNING

Most articles about long range planning list positive reasons for setting goals and objectives, but several empirical studies are cited by Jones (1986, pp. 111, 115-117) which question the assumption that such planning is necessarily related to good performance. Multiple informal information channels, informal communications, and ambiguity appear highly desirable in certain situations and were associated with better performance than was formalized planning. Pratt (1985) also recognizes the importance of communication and includes it in his conceptual model of a decision support system (figure 3, p. 24).

Jones (1986) is highly critical of the Jarrett Report (excerpts are cited by Jones) which was issued in March 1985 and is designed to address major cuts in university grants in England. The report states that it is in the area of planning, resource allocation, and monitoring that universities have the greatest opportunity to improve their efficiency and effectiveness. Jones questions the benefit of generating increased amounts of information and regrets the academic time which is lost compiling it.

Kee and Black (1985) question whether rational management techniques and budgeting systems lead to good decisions in the public sector. They challenge the notion that concentration on process, rather than results, is desirable. Budgets, controls on expenditures, and inability to hire or fire people tend to inhibit risk-taking in public bodies and discourage increased productivity. They also comment that, for example, talking about management systems is easier than assessing the product of public schools, but such talk is not as productive.

The many participants involved with the public sector have different values, and they may be unable to agree on goals. To manage the multiplicity of values, Kee and Black (1985) suggest harnessing the commitment to public service of employees. They state that this commitment is an untapped resource and that small work units can develop their own set of values or goals to give meaning to their work. An acceptance of diversity in ideas and service

delivery will provide flexibility within the constraints of law and politics, without the necessity for formal organization-wide long range planning.

Criticisms of the planning process appear mainly in connection with public sector organizations, including educational organizations. Differences between business and non-profit enterprises in organizational structure, political pressures, and types of control are cited as reasons why planning and resource allocations systems may need to differ (Jones, 1986, p. 118) between these kinds of organizations.

3.3 SIMILARITIES AND DIFFERENCES

There are similarities and differences between business organization and educational institutions which affect the way they plan. These will be discussed below. Then the differences between tertiary educational institutions and primary and secondary schools will be considered.

3.3.1 BUSINESS AND EDUCATIONAL INSTITUTIONS COMPARED

Business organizations usually begin their planning with a mission statement, corporate philosophy, or a determination of which of their options they will pursue in the long term. Gillenson and Goldberg (1984) compare general business planning systems with information systems planning and note the similarities between the two. They detail the information systems strategic planning methodology developed by IBM Corporation which uses "top-down, bottom up" aspects of planning. Educational institutions can adapt some of these aspects of planning to encourage participation in organizational decision making by department heads or school principals.

Naylor and Thomas (1984) describe many of the components of business planning and optimization models used in strategic planning. Some of the concerns are the same as those for educational institutions, e.g., which businesses should be supported for growth; which should be managed for greater cash generation; should certain businesses be divested and/or should acquisitions be sought? If one reads "departments", "disciplines", or "subjects" for "businesses", the same considerations are true for educational institutions.

Differences between kinds of organizational goals arise when businesses determine the level of dividends to shareholders and the level of debt which they might be willing to assume to finance growth and increase profits. Educational outputs are more difficult to quantify and do not relate to profits. Glose (1977) describes and defines relevant literary contributions about planning in education and industry and does not differentiate between the two. Most authors, however, discuss the difficulty of quantifying the outputs of education as a major stumbling block to commitment by some educational institutions to the planning process (Tierney, 1981; Whetten, 1981).

The systems approach can be used for either business or educational planning. This method categorizes variables as input, process, and output. The output of each model is input to the next. Changes can be made in the output of a system by modifying the inputs and/or the process. Changes in inputs or process are determined by evaluating the outputs according to predetermined criteria. The outputs must, therefore, be measurable (Van Dusseldorp, et al., 1971). Feedback from evaluation of outputs to changes in inputs and process is the most important part of the systems approach. Without feedback the system is out of control.

A systems model for a manufacturing business might have inputs of raw materials, direct labor and factory overhead into the production process with finished goods as the output. The finished goods would be expected to meet company standards of quality and quantity. Depending on the evaluation of the products, changes would be made in the inputs or in the production process within the factory. The finished goods would be input into another model, together with, perhaps, marketing, administration, and capital. The output of the final business model is net income or profit.

Inputs and outputs in education are not so easily defined because they are not so easily quantified as in business. Input variables in the educational process have been defined by Burkhead (quoted in Tanner, 1971) as follows:

1. Student Time
 - A. In the classroom
 - B. At home
 - C. Extracurricular

2. Personnel Time
 - A. Administrative
 - B. Teaching
 - C. Clerical
 - D. Maintenance
 - E. Auxiliary
3. Materials and Supplies
4. Buildings and Equipment (p. 68)

Educational organizations must find ways of quantifying the outputs in some way in order to evaluate the effectiveness of the system. The output of educational institutions is sometimes referred to as "education"; however, education is the process; and the output is educated people. Some of the examples offered for measuring and quantifying the output of educational organizations are (1) the percentage of students graduating from a university, (2) the number of students completing a high school mathematics course and receiving college credit, (3) analysis of student opinion concerning elements of an educational program (Tanner, 1971, Chapter 5). Measuring the output of educational programs is often based on test results and achievement (numbers 1 and 2 above) which are then compared with state or national norms. This strict testing approach, however, equates students with industrial products and may lead to a "cult of testing" (Tanner, 1971, p. 79). Tanner proposes that assessment of the value of an educational program by the participants should be a part of the evaluation element of the systems approach. He details the way in which this assessment can be quantified using the Bayesian program evaluation procedure (Tanner, 1971, Chapter 5).

Another planning technique used in business which might have applications in educational organizations is operations research. Operations research began in a military context in Britain during World War II and brought to business organizations numerous industrial applications involving mathematical and statistical forecasting which could be used in the planning process. In the 1950s the new techniques for planning were being adopted by businesses in the United States and were found to be quite useful, but there was a lag of twenty years before interest was shown by educational organizations. "A primary objective of operations research is still to improve decision making and planning through application of quantitative models" (Tanner, 1971, p. 7), mixed with human relations and subjective judgment. Operations research

tools are "potential vehicles for providing relevant information (feedback) at the appropriate time for decisions (Van Dusseldorp, et al., 1971, p. 4) and as such can facilitate educational as well as business decision making.

Other educational planning techniques, including the Bayesian statistical decision theory mentioned above, are listed by Tanner (1971) with their functions as follows:

- * Bayesian statistical decision theory (evaluation of student achievement; estimation of long range program effectiveness, and short range assessment of program components);
- * cost/effectiveness analysis (for allocation of resources; program planning, program evaluation; curriculum revision; explanation of resource allocation to policy makers and intra-program comparisons);
- * forecasting (long-range evaluation of program; prediction of student population trends, long range budget analysis; definition of long range aims and immediate objectives; prediction of policy variables, staff requirements, forecast facilities needed);
- * simulation (provision of feedback for program design based on expected behavioral changes; facilitation of planning by presenting alternative routes for policy formulation; training personnel);
- * critical path method and program evaluation and review technique (scheduled review of objectives, program analysis, budget development, and project monitor; early identification of trouble spots; facilitation of statement of objectives and task definition); and,
- * linear programming (allocation of resources, optimization of budget expenditures; computerized school lunch menu planning) (Tanner, 1971, p. 10).

Critics of rational systems for planning in educational organizations feel that management science and models might be suitable for business and industry but are inappropriate for educational organizations. Clark (1981) states that traditional planning systems rest on the view of organizations as goal-based entities whereas educational organizations are better characterized as "organized anarchy" (pp.42-60).

Jordan and Webb (1986) point out, however, that in contrast with the moral concerns about experimental research techniques using students, business

administrative practices adapted to education from business are likely to meet with minimum resistance.

Business practices from private and public service agencies conceivably could be transferred or adapted to education without interfering with the desired level of support for the instructional program (Jordan & Webb, 1986, p. 191).

To facilitate the introduction of planning techniques and business practices in educational institutions then, those operations which do not affect students may be the best places to start. More important for the entire organization, however, are models which provide pertinent information to decision makers in a timely manner to assist them with academic decision making.

Right decisions about aggregative and quantitative planning factors can provide the necessary conditions for academic excellence--the environment in which teaching and scholarship can flourish. But sufficiency requires, in addition, sensitive and informed judgments of a qualitative kind. Such judgments are the essence of outstanding academic leadership (Hopkins & Massy, 1981, pp. 9-10).

Models can be used in educational organizations to help "organize thinking and display it for systematic review" (Hopkins & Massy, 1981, p.16), develop a plan, or make a decision.

3.3.2 TERTIARY EDUCATION AND SCHOOL DISTRICTS COMPARED

Sources of Funds

The sources of funds for post-secondary, or tertiary institutions, in the United States differ in several ways from those of school districts. Both public and private tertiary institutions charge fees, or tuition. Many receive research funds. Public institutions receive money from some level of government - state, municipal, or county. Private institutions usually have endowment funds which generate interest and dividends. Both kinds of institutions may have alumni organizations which contribute to annual funding as well as to endowment funds.

School districts are agents of state governments. They derive their powers from state legislatures and usually have the power to raise taxes within the district with (and sometimes without) a referendum vote. Some state taxes are also allocated to school districts; and a small amount of federal money is

available, usually for specially designated purposes. Public schools may not charge fees, except for consumable materials used in the classroom. Details of school district financing are discussed more fully in Chapter 2.

Academic Programs

Academic programs at private and public colleges and universities usually depend upon the institution's charter which is reflected in the programs put forth by the various departments. These programs may be designed to attract only students who wish to enter a profession or study a particular subject such as medicine, law, music, or business. School districts, on the other hand, are required in most states to provide at least a minimum standard of education for all students in the district (standards and age of school leaving are determined by the state legislature), build and maintain adequate buildings, supply textbooks, equip libraries, provide transportation, and balance their finances annually. Expenditures beyond the minimum standards must usually be supported with local funds.

Public tertiary institutions, like school districts, may be mandated to provide certain areas of education (and may be required to balance their budgets annually), but private organizations have more leeway to expand or curtail their offerings. Therefore, private colleges and universities can choose to offer only the programs which they can fund adequately.

Expenditures

Expenditures of all educational institutions are primarily for personnel - teaching and non-teaching. Many states have continuing contracts for teachers in public school districts, similar to tenure for faculty members in tertiary education, which constrain expenditures in this area. Some auxiliary support personnel requirements in school districts are mandated by the states and usually include school counselors, librarians, specialists in education of handicapped students, and administrators.

Colleges and universities often provide residence halls for students, and certain academic programs require expensive equipment for student use and for research. School districts in the United States, however, serve only day students, and equipment purchases vary greatly between districts.

Enrollments

Enrollments also differ between different kinds of educational organizations. Private tertiary institutions may have to market their offerings aggressively or target their market to attract the number and kind of students they want or need. Public tertiary institutions may do the same, or they may be required to have an "open door" policy and admit any high school graduate who applies. School districts are responsible to the state for the education of every child living within the boundaries of their district.

3.4 FINANCIAL PLANNING MODELS AND SYSTEMS

To be effective, long range planning should be integrated with financial planning (Martin, 1987, p. 4). This will ensure that funds are available over a period of years to finance the activities which support the goals and objectives of the organization. Financial planning is the forecasting of receipts and expenditures over the long term. Budgeting is the detailed estimate of receipts and allocation of resources for the short term, usually one year (Nelson & Purdy, 1974, p. 77). Budgets should be prepared based on the first year of the long term financial plan. This section will review various financial planning models and systems used in business and educational organizations to determine which aspects of the models would be applicable for long range financial planning models for school districts.

Models consist of inputs, algorithms, and outputs. They are usually, but not necessarily, computer based. Computer based financial planning models offer the advantages of high speed and the production of low cost "what if" scenarios as input variables are changed (Updegrave, 1981). Financial models or systems can assist policy makers at all levels whether planning is centralized or decentralized (Cyert, 1981). In the context of school systems, financial models can be helpful in decision making at individual schools as well as at central offices.

Researchers (Bloomfield & Updegrave, 1981; Pratt, 1985) have noted that financial planning models and modeling in various types of institutions can be adapted by other public and private tertiary education institutions. Pratt (1985) used his findings in the United States as a basis for developing financial

models for South African universities. The financial planning models described here are designed for business or tertiary education. They will be examined to determine if and how they might be adapted for school districts.

Bromiley and Euske (1986) include financial planning systems in their list of rational budgeting systems. Their list includes Planning, Programming, and Budgeting Systems (PPBS) and Zero Base Budgeting (ZBB). Although budgeting is usually defined as resource allocation for only one year, these systems, particularly PPBS, are usually multi-year models. Clark (1981, p.43) adds Management Information Systems (MIS) and simulation models to the above list. While ZBB is not strictly speaking a financial planning system, it will be considered in this section because of its emphasis on the effectiveness of current programs which may be expanded, curtailed, or even dropped altogether in the future.

All of the systems listed above were widely publicized after United States President Lyndon Johnson first launched PPBS into the federal government's budgeting system in 1965 (Rege, 1986, pp. 25-26) and will be described below. The benefits of these systems were acknowledged to be sought after by business and educational organizations as well as governments.

3.4.1 PLANNING, PROGRAMMING, BUDGETING SYSTEMS (PPBS)

Rege (1986) defines PPBS as "a management technique that can present a substantial operation in simplified and understandable increments that, in turn, can be budgeted" (p. 26). The purpose of PPBS was to help find ways to do jobs faster, better and less expensively. Little wonder that businesses and public sector organizations embraced PPBS. The adoption of rational planning techniques, PPBS in particular, is cited as one of the three major changes in the operation of the United States federal government during the 1950s and 1960s (Mitchell, 1984, p. 133).

PPBS models require completion of a four step process which consists of:

1. program memorandum or an outline of the services to be offered,
2. a detailed plan describing the operations of the project,

3. the financial plan, and
4. program evaluation (Rege, 1986, p. 27).

However, PPBS has not proved as successful in business or education as had been anticipated. When PPBS was first initiated into civilian organizations, programs and possible outcomes were described in detail. They were described, not analyzed, and little selectivity was employed. The result was long shelves of material which were impossible to consolidate into meaningful financial plans (Glose, 1977).

Some of the other reasons PPBS is no longer popular in government and industry may be the same as those noted in tertiary education where experience with PPBS has been disappointing (Clark, 1981). Some of the reasons for this disappointment are:

1. emphasis on complex, detailed formal program structures;
2. difficulties defining benefits and outputs;
3. costly data and staffing requirements;
4. inadequate mechanisms for cost/benefit analysis; and
5. lack of confidence among faculty and administrators in the techniques of the systems (p. 47).

Advocates of PPBS believe that the reason for the failure of the systems in tertiary education lies in technical problems of implementation, while some organizational theorists challenge the "appropriateness of the assumptions supporting goal-based, rational, sequential planning" (original author's emphasis, Clark, 1981, p. 47).

Many PPBS models have been tried in school districts. Glose (1977) describes in detail those PPBS models which were surveyed by Kiser, Lenchyshyn and Douglas in 1976 and determined to be indicative of the types most used. The models are:

1. *The Educational Resources Management System* developed by William Curtis et al. (ASBO Model).

2. *An Educational Planning and Evaluation Guide for California School Districts* developed by Peat, Marwick, Mitchell and Co. (California Model).
3. *PDK Educational Planning Model* developed by the Northern California Program Development Center (PDK Model).
4. *Planning-Programming-Budgeting Systems, Procedures Manual for School Districts* developed by the University of Pennsylvania, Government Studies Center, Fels Institute of Local and State Government (Pennsylvania Model).
5. *SPEC: What It Is and What It Does, School Planning Evaluation and Communication System* developed by John Nagle et al. (SPECS Model).
6. *An Operational Model for the Application of PPBS to Local School Districts* developed by Chester Kiser et al. and *W.N.Y. Planning-Programming-Budgeting System, Self-Instructional Lessons and Performance Guides* developed by John Murphy et al. (W.N.Y. Model).
7. *Systematic Decision-Making in Education: A Planning Guidebook* developed by the Erastask Force (Eras Model) (Glose, 1977, p. 49).

Each of these systems was designed for a particular school district or group of districts. As a result they possess a variety of strengths and weaknesses. The suggestion has been made that users of PPBS choose segments of each of the models and adapt them to suit individual needs (Glose, 1977, p. 51).

During the early 1970s several Ohio school districts experimented with PPBS. Jordan and Weaver (1972) describe the concepts applied to a school district in Dayton, Ohio. The project collapsed under volumes of paper produced for alternative program outcomes and the cost of staff time devoted to the process, a commonly cited shortcoming of this kind of system.

PPBS has been listed as an example of one way an organization can respond to declining revenues by "altering the mix of educational services" (Whetten, 1981, p. 82) rather than just cutting back all programs. But despite the advantages offered to school districts by the implementation of PPBS-type systems, Cardinale notes in 1981 that there is a "relative dearth of PPBS articles in recent education literature compared to a decade ago" (p. 24). Ten urban United States school systems studied in depth during the 1980s showed that "no system had a fully operational system of budget analysis that

incorporated program performance data in budget allocation decisions" (Cibulka, 1987, p. 15), and the greatest deficiencies were in multi-year goal setting and financial planning.

Implementation of PPBS in the United States federal bureaucracy was unsuccessful (Mitchell, 1984, p.134), and its use was discontinued although the model is still used by some state and local governments (Bromiley & Euske, 1986). Hopkins and Massy (1981) note that no PPBS systems were operating successfully in higher education in 1973.

Although not many PPBS models have been successful in business or educational institutions, the rational approach of the systems is appealing and "emphasizes a conceptual framework that can be a very productive tool in the hands of an imaginative chief executive" (Rege, 1986, p. 26).

The concept of combining planning, programming, and budgeting will be expanded in the model to be developed in this study to integrate academic planning with long range financial planning.

3.4.2 ZERO BASE BUDGETING (ZBB)

Zero Base Budgeting (ZBB) is often mentioned as a system similar to PPBS. While ZBB is thought of mainly in connection with an annual budget, it is applicable to financial planning because each program or department is analyzed to determine whether it is needed to reach the overall goals of the institution. ZBB requires that managers justify every expenditure for their programs or departments. They may even be required to justify why any money should be allotted for their budgets (Rege, 1986, p. 28). ZBB systems became popular after United States President Jimmy Carter advocated them for the federal government budgets in 1977. Steps for implementing ZBB include:

1. objective formulation, to determine the responsibilities of persons involved in a program and criteria upon which their performance can be evaluated;
2. determination of decision packages, each package to be independent of others and start at zero base;

3. development of a support system, to describe all information which cannot be quantified and alternative courses of action involved in accepting or rejecting the package;
4. ranking of decision packages, to provide a step-wise incremental analysis for a cut-off based on available resources (pp. 28, 29).

"The allocation of resources to various programs designed to reach the rationally selected goals is assumed to occur on the basis of a calculated cost/benefit analysis" and focuses on the decision makers as problem solvers (Whetten, 1981, p. 90). Although ZBB is conceptually sound, marginal programs are often the ones most thoroughly scrutinized. A zero base may turn out to be, in actual practice, a 70 percent or 90 percent based budget (Rege, 1986, p. 30) with most of the previous year's budget guaranteed and only additions to the guarantee subject to scrutiny.

ZBB is most effective during periods of declining or scarce resources.

Because they have little incentive to innovate during periods of resource abundance, educational organizations typically use additional resources to do 'more of the same.' Therefore, the key to enhancing the adaptive potential of these organizations is utilizing the pressure of scarcity to spur innovation (Whetten, 1981, p. 92, original author's emphasis).

Rege (1986) states that ZBB has problems if senior administrators are not involved in the process. ZBB is a "philosophy, a way of thinking that needs to soak into an organization" (p. 29). Often too much is expected from ZBB, and it is expected too soon. Zero base budgeting will not be part of the model to be developed in this research although the process could be used by school districts when budgeting within the parameters of the first year of a long range financial plan.

3.4.3 MANAGEMENT INFORMATION SYSTEMS (MIS)

Information systems are the means by which information is collected and delivered. Collecting facts, or data, is the first step in an information system. These data are then processed, assembled, analyzed, or transformed in a variety of ways. But data processing is only part of the process. The ways in which facts are analyzed, retrieved and distributed can be information to those

who receive and understand them; or, if not properly processed, they can be piles of paper covered with useless data.

Information can be treated as a scarce resource which should be made available to the group which needs it most. When an organization begins to view data as information, it can become a natural part of strategic thinking and planning according to Gillenson and Goldberg (1984). Other writers agree that management information systems (MIS) can be the base of historical analysis. However, when planning for the future, information which is not normally in an MIS system is needed; and Decision Support Systems (DSS) which are more flexible than MIS are more valuable (Harris, 1983; Milter & Rohrbaugh, 1985; Pratt, 1986). Decision support systems are discussed in section 3.4.4.

Cheit (1977) noted that academic men and women were becoming aware of management systems and thought it was time for technical matters to be understood, analyzed and commented on in print. Since then much has been written about MIS - what it can and cannot do. At about the same time, McCorkle (1977) discussed the subject of decision makers' need for management information (as opposed to data) to know how an organization system is operating. "One cannot know the appropriateness or usefulness of any particular piece of information in the abstract. He must know how that information will be used and by whom" (p. 2).

One of the weaknesses of MIS was recognized early on by Sandin (1977) who suggests that the failure of timing, the need by decision makers for information at a specific moment in time, has not been recognized by designers of large, organizational, information-based planning systems. If information is not available when needed, decisions must be reached without it. Monthly reports show where an organization has been and what it has done, but more timely information is needed for decision making.

Even with very elaborate information systems, educational decision-makers continue to depend very heavily on their experience-based intuitions when it comes to judging the relative costs and benefits of a particular program design or resource allocation. And they tend to use information system output as an after-the-fact rationalization to support intuitive judgment which they have reached independently (p. 23).

Another obvious limitation on the use of MIS is the cost. "Creation and installation of an information system call for information regarding the relative costs and benefits of such development" (Sandin, 1977, p. 24). Administrators may be unsure of exactly what information they want or need, and information system designers may have unrealistic ideas about what decision makers ought to need. The result can be a costly system which does not produce the benefits originally promised.

For the reasons mentioned above as well as other reasons, Hopkins and Massy (1981) conclude, as did Sandin (1977), that organizational MIS is too expensive for most educational institutions to invest in all at once, and it is not necessarily the way to begin computerizing an educational institution. The micro computer revolution has opened the way for departments or segments of an organization to have their own information systems which may, or may not, be connected with an organizational MIS (Grafton & Permaloff, 1985). In time, these independent micro computer systems may be part of the design of a database system. Database systems should include all of the information needed by management in a form in which it can be retrieved and reported. This has become an important aspect of planning an MIS (Gillenson & Goldberg, 1984). The models developed by Hopkins and Massy (1981) and others can be important in MIS design (p. 8).

The financial planning model to be developed in this research will be designed to import information from an MIS or to use summary information compiled by an MIS.

PPBS, ZBB, MIS and other financial planning systems are discussed by Hopkins and Massy (1981) who describe them as forerunners of financial modeling which will be discussed in section 3.5.

3.4.4 DECISION SUPPORT SYSTEMS (DSS)

A decade ago, before decision support systems (DSS) had evolved from information technology, the need for an effective way in which to extract decision making information from large information systems was recognized. McCorkle (1977) realized that MIS systems contained valuable data, but it was inaccessible to decision makers when they needed it. He writes about "the

Magic Computer" and regrets that too many educational administrators believe that the numbers which appear on computer printouts are "facts" and are "in-and-of-themselves compelling" (p. 6). If administrators want an answer to a simple question, they find themselves off on an involved data chase. McCorkle doesn't want to scrap information systems or build new ones. He simply wants to learn how to extract information in a timely and organized way in order to use it for decision making. One of the ways to extract the information needed from MIS is to connect the mainframe with a micro computer programmed with a decision support system.

A DSS is a computer-based set of procedures, mechanisms, equations or algorithms that can analyze various implications and contingencies under a variety of options under consideration (Milter & Rohrbaugh, 1985). It may interface, or connect, with organizational MIS or it may stand alone.

Pratt (1985) presents a definitive study of DSS - what it is and how it can be used in the context of educational financial planning. His empirical work with United States universities presents a complete study of how and why DSS are used by these institutions. He expands Head's and Sprague's hierarchies of information by adding MIS, DSS, and communications to all areas of an organization and presents a conceptual framework of DSS (Figure 3, p. 24) which shows inputs of intuitive forecasts, exogenous variables, and the historical values of variables. Within the model "black box", Pratt includes an econometric model for the exogenous variables and statistical forecasting of the historical values of variables. The model includes risk determination, simulation, optimization, variable manipulation and sensitivity "what ifs". The decision maker is presented with reports and graphics to aid in decision making.

Huber (cited in Milter & Rohrbaugh, 1985, p. 176) points out the often neglected fact that all executives and administrators use their own personal management information system (mis) and decision support system (dss) every time they make decisions. These personal systems consist of the files, memoranda, facts and experiences which they have always had at their disposal for answering questions and considering alternative solutions to problems. He describes MIS as the computer based part of the mis system.

He further describes the computer based system of dss as DSS - a group of analytical tools for presenting alternatives.

Militer and Rohrbaugh (1985, p. 176) state that MIS and DSS are used most commonly to answer repetitive questions and problems and that they work well at the lower levels of management. Strategic decisions, however, are much broader and "must engage the totality of the mis and dss available to them." Therefore,

the challenge for executives ... is to take advantage of the benefits of well-designed MIS and DSS while making full use of the important additional features of their own mis and dss (p. 179).

Pondy (cited in Militer & Rorhbaugh, 1985) agrees that both computerized and personal information should be brought to bear upon solutions and states that

to be exclusively rational is to mediate all one's perceptions and actions through a previously articulated frame of reference; to be exclusively intuitive is to relate to the work without the mediation of such a frame; to join rationality and intuition is to create meaningful frames of reference in the midst of acting, over time, out of one's own lived experience (p. 190).

Harris (1983) discusses the use of modeling for financial forecasting and observes that "the distinction between this item and just giving a mid-range forecast is the involvement of the institutional policy maker" (p. 99). His empirical work, however, fails to confirm that this involvement is taking place in college and universities.

The financial planning model developed as part of this research will be designed for interaction with school district decision makers.

3.4.5 EXECUTIVE SUPPORT SYSTEMS (ESS)

Pratt (1986) differentiates between DSS and Executive Support Systems (ESS). The former support decision making throughout the organization while the latter support individual executives in their decision making roles (p. 38). ESS may be as simple as a spreadsheet or a packaged program.

ESS are designed to assist with strategic choices, unique situations which require decisions after all available quantitative and qualitative information has

been accessed and organized. ESS software is developed to structure complex problems, prioritize major organization goals, justify strategies, discover new questions, and chart the optimum way to reach organizational goals. It is not designed to cope with group decision making (Milter & Rohrbaugh, 1985).

Milter and Rohrbaugh (1985) discuss some of the packaged programs available to executives for their direct use which they describe as "mindware" or "knowledge-based" (p. 180). They are not to be confused with MIS or DSS but are intended to "bring needed structure to unique and complex strategic choices" (p. 180).

ESS are designed for individual managers to support them in their decision functions. Recent research suggests that a significant number of executives design their own computer models rather than using those designed by staff, and most of the models are simple (Pratt, 1986, p. 38).

Both DSS and ESS are designed for micro computers which can be easily operated by persons unfamiliar with computer languages. While central administration may have mainframe or mini computer programs for accounting,

it will often use microcomputers for analysis ... Furthermore, analytically oriented software for mainframe or minicomputers is very costly, and mainframes and minis are often tied up doing routine record keeping ... Administrators have found themselves waiting weeks or even months for ... analyses that could have been done in a few days or hours on a micro (Grafton & Permaloff, 1985, p. 203).

DSS and ESS take a piecemeal approach which is more likely to answer the questions that administrators are asking than a comprehensive system such as MIS (Hopkins and Massy, 1981).

Some of the objections to ESS which have arisen include the fact that many top-level executives see use of a keyboard for data entry as not a part of the executive role. Others see repeated use of computer based decisions as degrading strategic decision making to a mechanical procedure which may limit creativity and stifle novel or innovative approaches to problems (Milter & Rohrbaugh, 1985). It is unknown at this time whether use of a keyboard is a

barrier which discourages school district decision makers. This will be explored empirically.

3.4.6 OTHER FINANCIAL PLANNING SYSTEMS

Some tertiary educational institutions have welcomed analytical models in planning and budgeting like CAMPUS (Comprehensive Analytical Methods for Planning in University Systems) and RRPM (Resource Requirements Prediction Model). These have been described as "cost-simulation" models which focus on academic departments or other smaller units on a university campus. Hopkins and Massy (1981) describe the systems mentioned above and point out that the sheer size of the models and the effort needed to retrieve the data from university records makes these models unsatisfactory for planning purposes. However, Harris (1983) found that

like no other tool, financial planning models forced policy makers to take a hard look at institutional weaknesses and the tough decisions that had to be made (pp. 131-132).

When questioned about planning and budgeting systems by Plourde (1976) in the 1970s, some users of models were unsure about whether the new technologies would increase efficiency in higher education (see pp. 17-32 for results of this national survey). Several years after Plourde's (1976) survey, Pratt (1985, pp. 236-237) surveyed United States tertiary educational institutions and discovered that although some of them were using models developed by others, many of them were creating their own financial models as well (see section 3.5 for a discussion of financial modeling).

Many other financial planning systems, which may have applications for school districts, have been developed for tertiary institutions since the mid-60s when the usual steady expansion of their funds began to erode. Colleges and universities in the United States, like school districts, faced tightening of resources as the result of several factors. These factors include slower growth or even decline in number of students, other social priorities coming to the fore, economic circumstances, and the public's disenchantment with higher education (Hopkins & Massy, 1981).

Hopkins and Massy (1981) detail Stanford University's "Quest for Long-Run Financial Equilibrium" (p. 227) and explain how their modeling concepts evolved and how financial planning models were designed. Their aim was to provide quantitative models to keep track of all the details that mental models fail to track properly when alternatives are being considered.

Hopkins and Massy (1981) discuss the transferability of university modeling concepts (p. 434) and assert that some of these concepts are applicable to other not-for-profit institutions. They describe and evaluate the experiences of four institutions which tested the transferability of the models and modeling concepts developed for Stanford University. The experiences of the institutions in the experiment were varied, but none of them could use the models in their original design. Each organization had to make adjustments to meet their unique situations.

Rege (1986) describes an "efficient" system in preparation for developing another financial planning model. He states that such a system has the following characteristics:

1. It should establish a link between the objectives and budget proposals. It should be based upon a plan of action supported by good forecasting techniques.
2. The system should identify alternatives. It should use incremental budgeting analysis and allow decision-makers to compare incremental budgets of various organizational units by comparing their costs and the benefits generated by them.
3. It should use the packaging approach of ZBB (zero base budgeting) without forcing justification of each and every expenditure.
4. The system should incorporate the evaluation procedures of a PPBS and aim to improve efficiency in the future (p. 30).

Rege (1986) uses these characteristics to design an alternative planning-budgeting system which combines aspects of several of the classical theories.

In 1977 Glose developed a long range financial planning/forecasting model for some local school districts in New York State. Cardinale (1981) designed a

generic MIS system for forecasting personnel information for school districts in Massachusetts. These will be described in detail in Chapter 4.

In addition to the systems and models described above, other packaged models come on to the market every year. Some organizations, however, prefer to design financial planning systems specifically adapted to their own institution. This process, called financial modeling, will be discussed below.

3.5 FINANCIAL MODELING

Financial modeling is the process of designing a financial planning model. A model can be implicit such as a mental model, or it can be explicit - written down in some form. The purpose of a model is to synthesize facts, ideas, theories, etc. into patterns. Models can be graphs, words, or designs and can deal with qualitative as well as quantitative material.

Financial planning models are quantitative expressions of resources and expenditures. Decisions in education are usually qualitative, and financial planning models are designed to show the financial impact in the future of those decisions (Hopkins & Massy, 1981).

Hopkins and Massy (1981) and Pratt (1985) trace the evolution of MIS, DSS, ESS, and financial modeling in educational settings and the advantages and disadvantages of each. While their work relates to tertiary educational institutions in the United States and South Africa, the guidelines and procedures are relevant to other organizations. Before these are discussed, some of the concerns about modeling in an academic setting will be mentioned.

Some of the barriers to effective modeling, are listed by Hopkins and Massy (1981). These are concerns which Massy stated several years before he and Hopkins (1981) were involved in the first attempts to computerize decision making at Stanford University. The list is summarized below.

1. Centralized planning is dangerous because it takes initiative away from those best able to exercise it. Even if the process is participative, it tends to drive out creativity and judgment.

2. It will be more difficult for profound but qualitative judgments to make themselves felt, and most important decisions are value-laden and qualitative. Models represent unfair and undesirable competition.
3. Planning has not always worked well in the past. There are no guarantees that detailed planning will work better than prompt response to feedback. An important question is whether imperfect planning is better than periodic response to changing events (p. 11).

Bloomfield and Updegrave (1981) cite other reasons why tertiary institutions may be reluctant to engage in financial modeling which include:

1. Nothing is measurable in higher education, so modeling is hopeless.
2. Higher education faces too much uncertainty to use modeling effectively.
3. The key policy decisions in colleges and universities, unlike business, cannot be modeled because goals are multidimensional and ill-defined.
4. Modeling approaches are basically anti-intellectual, and thus incompatible with college and university governance.
5. Modeling has been tried in higher education, and it has not worked.
6. Successful modeling requires technical expertise (pp. 94-97).

In their discussion of the above limitations on modeling in higher education Bloomfield and Updegrave (1981) cite examples of institutions which have tried to use modeling and failed. They point out, however, that business organizations also face uncertain futures and that large organizational computer systems are expensive and are not always successful for planning.

The potential benefits of modeling in education, however, far outweigh the concerns. For example, some of the areas in educational institutions function like any other business. Examples are food service, residence halls, motor pools, and computer centers (Bloomfield & Updegrave, 1981). Modeling should be as successful in these areas within universities as it is in business organizations. In addition, the benefits of modeling are usually described as better decisions and greater understanding of the problem at hand. Bloomfield

and Updegrave (1981) state that this second benefit may be more important than the first.

While it is difficult to prove that modeling has changed a decision, the process itself leads to greater understanding of the variables involved and the options available. The benefit of modeling most mentioned in McNeish and Updegrave's survey of users (cited in Bloomfield & Updegrave, 1981, p. 102) is the increase in the number of alternatives which can be considered. The second most important benefit was increased understanding of the problems.

A more recent survey by Harris (1983, p. 133) included a question about the limitations of financial models and modeling and asked respondents to mark them in order of importance. The limitations listed were as follows:

1. Qualitative variables cannot be included in a mathematical model.
2. Political variables cannot be included in a mathematical model.
3. Relationship between some variables is questionable.
4. Values of some variables are not known.
5. Over-emphasis is on the numbers game.
6. Available data used rather than needed data.
7. Limitations are not taken into account by policy makers.
8. Total outcome (e.g. educational outcomes) is not shown.
9. Model structure can't easily change.
10. Does not address the real needs of policy makers (p. 133).

Interestingly, the 107 respondents gave No. 10 the lowest rating which indicates general satisfaction with the modeling process, and none of the ratings of other items revealed outstanding limitations.

Another of Harris's (1983, p. 127) questions lists the conventional advantages of using models and asks that the three most valuable be marked. The list is as follows:

1. Save time in tedious calculations.
2. Consider more alternatives.
3. Policy makers better informed.
4. Better understand situations.
5. See possible courses of action.
6. Constraints of decision defined.
7. Talk more about the issues.
8. "Ripple" effect of a decision is shown.
9. Take future outcomes into account.
10. Ask better questions.
11. Have confidence in decisions.
12. Make different decisions (p.127).

Item No. 1 received the highest rating from respondents with numbers 2 through 4 receiving the next highest number of responses.

Hopkins and Massy (1981) suggest the following guidelines for modelers as summarized by J. Wyatt in 1979 following a pilot modeling program at the University of Pennsylvania:

1. Decision makers who use models must be involved in their development.
2. Data must be representative and reliable.
3. Models must have an executive godfather (key executive).
4. Models must be comfortable to their users.
5. Results must be communicated with care (cited in Hopkins and Massy, 1981, pp. 444-445).

Following those guidelines, Hopkins and Massy (1981) developed their own characteristics of a good model which are listed below:

1. A model should be simple. The simpler it is, the easier it is to understand, and the more likely it is to be accepted by decision makers.

2. A model should be complete on important issues. It must be comprehensive and take into account the main issues important to the decision maker. It must allow the decision maker to integrate its results with his/her own thinking.
3. A model should be easy to control. Its outputs should be more or less predictable from its inputs. Its outputs should be controllable by the decision maker by manipulation of inputs.
4. A model should be stable. Given reasonable inputs it should never produce nonsensical answers.
5. A model should be adaptive. This criterion has much in common with completeness and simplicity. An adaptive model will seem to be easier for the decision maker to control. It will be more like a personal tool, more credible and usable.
6. A model should be easy to communicate with. Careful attention should be paid to ways in which data are input, tested for internal consistency, and saved for future use. The same is true of outputs. The time and energy of the decision maker and staff are limited. It makes a difference if communicating with the model is easy or difficult (Hopkins & Massy, 1981, pp. 19-21).

The above criteria suggest that micro computers are more likely to be appropriate for long range financial planning than mainframes or minis. Financial planning systems which must be manually implemented or which are part of a mainframe computing system do not meet all of the above criteria (Hopkins & Massy, 1981, p. 21).

With the decreasing costs of purchasing micro computer equipment (Cardinale, 1981, p. 35-37), the opportunities for modeling have expanded. In a survey of tertiary educational institutions in the United States, Pratt (1985) discovered that "the majority of modelling (72% of respondents) for both revenue and expenses is performed on an aggregated total university basis" (p. 239) and that 81% of the respondents use spreadsheet models (p. 233). Pratt's models for financial planning for South African Universities were subsequently designed for micro computers.

Pratt (1985) also points out that implementers of financial modeling are accountants or financial administrators, not MIS or data processing personnel. He recommends that policy makers themselves become proficient at modeling (p. 276).

In their chapter covering financial planning under uncertainty, Hopkins and Massy (1981) list eight steps in a planning and budgeting cycle for a tertiary educational institution. Although the steps listed are for one year, the same work is being done simultaneously for the four fiscal years following the current year. The planning cycle begins more than a year before the beginning of the period for which the plan is designed. As each year's plan is completed, the beginning balance for the following year will change. The process is one which allows for ever more accurate estimates of anticipated resources and expenditures which become part of a five year financial plan. The steps in the process are:

1. Perform special analyses.
2. Prepare and present Middle Range Financial Forecast (defined as a five-year forecast).
3. Refine income and expense estimates for next fiscal year.
4. Present to Board for action on budget guidelines.
5. Prepare detailed budgets.

START OF FISCAL YEAR

6. Refine income and expense estimates, make autumn budget revisions.
7. Review income and expense performance, make some "conditional expenditure" decisions.

END OF FISCAL YEAR

8. Complete year-end closing; make final "conditional expenditure" decisions; and determine actual surplus/deficit for the year (p. 279).

Although these guidelines were developed for colleges and universities, they might be adaptable for school districts in the United States.

Educators who are considering financial modeling should be aware of the limitations given above as well as the advantages, and Hopkins and Massy (1981) describe ways that educators can maintain intellectual control during the process of model building. They are:

1. Decision makers should know their models. They should be encouraged to gain practical experience and to know how much control they have over their models. They should communicate any shortcomings they see with the model builders.
2. Model builders should share their assumptions. Technical staff should write up and circulate the assumptions which led to the design of their models.
3. The computer can be challenged. Modelers should be able to explain in simple terms how any number was derived and, perhaps, calculate it by hand. This allows the decision maker to better understand the model.
4. Model builders don't know everything. Specialists in relevant subject areas must make their needs known and should be involved in every aspect of model building (p. 454).

It is not always easy for educators to maintain intellectual control as models become more and more complex. Models should not be more sophisticated than decision makers consider credible and helpful, or they become merely interesting and unused (Hopkins & Massy, 1981).

3.5.1 SCHOOL DISTRICT FINANCIAL PLANNING VARIABLES

This section introduces the subject of variables as a continuation of the discussion of modeling above and describes types of variables. A discussion in more detail will be continued in Chapter 4.

Primary planning variables are the variables on which organizational planning is focused. They are controllable or partially controllable by decision makers. All of the variables "should be important, understandable, and so defined that data can be made available or subjective judgments brought to bear ... (they) should take account of how planners and decision makers actually look at problems" (Hopkins & Massy, 1981, p. 456). Hopkins and Massey (1981) also suggest that many educational institutions begin with computer models for financial projections which lead, over time, to detailed consideration of alternative primary planning variables. Primary planning variables for school districts which meet the criteria listed above include academic programs; pupil/teacher ratios; number of teachers, administrators, and non-teaching personnel; building needs; salary/wage agreements; property tax rates; fringe

benefit costs; equipment needs; purchased goods; earnings from investment of inactive funds; and purchased materials.

Variables which affect school districts but are not controllable by decision makers are called external or exogenous variables. These include the legal requirements of state, federal, and local governments; economic factors; political considerations; demographics; and historical data. Since school districts are responsible for the education of all pupils living within their district, financial planning models for school districts are primarily dependent on enrollment forecasts which may be forecasted using demographics and historical data. Accurate enrollment forecasts are the basis for determining personnel costs, and many researchers have noted that personnel costs comprise 80% or more of school district expenditures (Glose, 1977; Cardinale, 1981; Lee, 1982; Smith, 1985).

Central to the models developed by Hopkins and Massy (1981) for universities is enabling institutions to reach and maintain long range financial equilibrium or annual receipts equal to annual expenditures. Since school districts are also educational institutions, the outcome of long range financial planning should be similar. The differences in sources of operating funds and legal restrictions on expenditures between tertiary and primary/secondary educational organizations, however, indicate that some differences in financial planning outcomes may be required. Positive cash balances at year end indicate fiscal health in school districts (Smith, 1985). However, the size of the cash balance over a number of years should be sufficiently large to keep the district operating until an additional levy can be passed. Since passing levies for additional operating income is not usually an annual event, cash balances in school districts would vary more than those in universities. There would tend to be large cash balances for the first years after passing a new levy, and smaller balances decreasing in size as years pass. Since cash balances (receipts minus expenditures) can be determined by decision makers by manipulating other primary planning variables, they could be termed primary planning variables. They could also be used as constraints by running the model iteratively until decision makers were satisfied with them in the long term.

Some of the primary planning variables and exogenous variables for school districts are similar to those in universities, and Hopkins & Massy's (1981, p. 457) development strategy for financial planning models could prove helpful for developing financial models for school districts.

3.6 SUMMARY

Long range planning and financial planning have been used in business for many years (Brook, 1984; Thompson & Strickland, 1984). Educators have at times been skeptical of the transferability of planning/budgeting programs to tertiary institutions because of the differences between business and education. The most obvious differences are collegial decision making in universities, which Clark (1981) refers to as "organized anarchy". The biggest difficulty is quantifying educational outputs. There are similarities between business and tertiary educational organizations, however, and some departments or segments of universities are run like small businesses (e.g., food service, residence halls).

Differences exist also between tertiary education and school districts in the kinds of resources they receive and the ways in which they may use those resources. School districts, generally, have more legal restrictions in the areas of revenues and expenditures because they are state agencies. There are similarities in that expenditures are primarily for personnel, and the process - education - is the same.

Business and tertiary education institutions begin their planning cycle with a mission statement and a corporate plan (business) or an academic plan (tertiary education) followed by financial planning. Annual budgets are then developed to fit into the financial plan. School districts may have adopted a mission statement and/or goals and objectives, but the literature suggests that the annual budget is not tied to goals and objectives or to a master or academic plan by means of a financial plan.

There is a wealth of material which demonstrates that financial planning models, when part of the overall planning system, enable business organizations and tertiary educational institutions to avoid financial crises.

School districts face the same declining enrollments and similar restrictions on resources as tertiary educational institutions, but there is a lack of information about how school districts are coping with their financial problems in the 1980s.

Planning/budgeting programs like PPBS and ZBB have not been successful in government, business or education, and few are being used today (Rege, 1986). Some school districts have also tried to implement these programs but found them too cumbersome and too expensive (Glose, 1977). Management information systems (MIS), usually on mainframes or mini computers, are useful in business and education for recording historical information, but not for planning or decision making. They are not as accessible as micro computers, and programming must be done by data processing personnel rather than decision makers.

To implement financial planning and modeling successfully, administrators and school board members must be willing to devote the time and resources necessary for the planning process. However, planning for the long term and providing the financial resources to carry out those plans should enable school districts to adapt better to the problems and pressures they face.

The primary planning variables for school district financial planning models include staffing, academic programs, building needs, equipment, support services, and others. The primary decisions affecting personnel costs, the largest expenditure of school districts, are made at the school district level.

3.7 CONCLUSIONS

School boards and administrators should act in purposeful, deliberate and systematic ways and make assumptions which relate to long term optimal choices, not short term pressures. They should recognize that academic decisions have financial consequences. Using financial planning as a tool, school districts can identify and, perhaps, avoid financial crises. The experiences of business and tertiary institutions with business or academic planning, financial planning, and financial modeling can form the basis for the

adaptation and implementation of financial planning and modeling for school districts in the United States.

Some tertiary institutions are successfully using micro computers with financial models and modeling (Hopkins & Massy, 1981; Pratt, 1985). Although there are differences in sources and expenditures of funds, the similarity of tertiary institutions and school districts in their end product - educated people - suggests that financial planning models for school districts can be similar to those for tertiary education. It may be possible to adapt models, or parts of models, for school districts from those already developed for tertiary institutions.

Current literature (Cardinale, 1981; Cibulka, 1987; Jordan & Webb, 1986; Lewis, 1983) suggests that little progress has been made during the past ten years in financial planning for school districts although some districts have MIS. MIS can provide input of historical figures for financial modeling systems, but they are not as satisfactory for financial planning as micros. Micro computers are probably the best hardware for financial planning because no programming knowledge is needed, and they are generally more accessible than mainframes or minis.

Given the diversity among the more than 15,000 school districts in the United States (National Education Association, 1984), it is unlikely that any one model can be developed which will be helpful to all of them. Generic models may, however, be developed which most school districts will find useful for decision making. Those districts which have the expertise and can afford to do so may choose to develop their own financial modeling techniques. The guidelines for implementing financial modeling which have been developed by tertiary educational institutions may be useful for school districts (see Chapter 8). These should enable school district decision makers to avoid some of the financial problems which plague their districts.

REFERENCES

CHAPTER 3

- Bloomfield, S.D. & Updegrave, D.A. (1981). Modeling for insight, not numbers. *New Directions for Higher Education: Management Science Application to Academic Administration*, 35, 93-104.
- Bromiley, P. & Euske, K.J. (1986). *The use of rational systems in bounded rationality organizations: A dilemma for financial managers*. *Financial Accountability and Management*, 2(4), 311-320.
- Brooke, M.Z. (1984). *Centralization and autonomy, A study in organization behaviour*. London: Holt, Rinehart and Winston.
- Cardinale, O. (1981). On a generic management information system model with applications to public school systems. *Dissertation Abstracts International*, (University Microfilms No. AAD82-03949).
- Caruthers, J.K. (1981). Strategic master plans. *New Directions for Institutional Research, Evaluation of Management and Planning Systems*, 31, 17-27.
- Cheit, E.F. (1977). Challenges inherent in the systematic approach. *New Directions for Institutional Research*, 15, 57-78.
- Cibulka, J.G. (1987). Theories of educational budgeting: Lessons learned from the management of decline. *Educational Administration Quarterly*, 23, 7-40.
- Clark, D.L. (1981). In consideration of goal-free planning systems in education. *Educational Administration Quarterly*, 17(3), 42-60.
- Cuthbert, R. (1981). Developing a corporate strategy for college management. *Coombe Lodge Report*, 14(4), 223-233.

(References continued - Chapter 3)

- Cyert, R.M. (1981). Management science and university management. *New Directions for Higher Education: Management Science Application to Academic Administration*, 35, 27-40.
- Gillenson, M.L. & Goldberg R. (1984). *Strategic planning, systems analysis, and database design*. New York: John Wiley & Sons.
- Glose, G.P. (1977). A long range financial planning/forecasting model for local school districts. *Dissertation Abstracts International*, (University Microfilms No. AAD78-14000).
- Glover, R.H. & Holmes, J. (1983). Assessing the external environment. In N.P. Uhl (Ed.) *Using Research for Strategic Planning* (pp. 7-18). *New Directions for Institutional Research*, 37. San Francisco: Jossey-Bass.
- Grafton, C. & Permaloff, A. (1985). Budget implementation with microcomputers. *Public Productivity Review*, 20, 202-212.
- Harris, D.E. (1983). *Representations of a harsh reality: The use of computer planning models in higher education*. Unpublished PhD thesis, Claremont Graduate School.
- Hopkins, D.S.P. & Massy W.F. (1981). *Planning models for colleges and universities*. Stanford, CA: Stanford University Press.
- Jones, C.S. (1986). Universities, on becoming what they are not. *Financial Accountability and Management*, 2, 107-119.
- Jordan, K.G. & Webb, L.D. (1986). School business administration. *Educational Administration Quarterly*, 22, (3), 171-199.

(References continued - Chapter 3)

- Jordon, L.G., & Weaver, J.L. (1972). *Planning-programming-budgeting concepts applied to public school district financial management* (Order No. AD-741-409). Springfield, VA: National Technical Information Service (ERIC Document Reproduction Service No. ED0668 15).
- Kee, J. & Black, R. (1985). Is excellence in the public sector possible? *Public Productivity Review*, Spring, 25-32.
- Kirschling, W.R. (1976). Models: Caveats, reflections and suggestions. *New Directions for Institutional Research*, 9, 1-11.
- LaMorte, M.W. & Williams J.D. (1985). Court decisions and school finance reform. *Educational Administration Quarterly*, 21, (2), 59-89.
- Lee, R. (1982). *Financial and staffing ratio analysis: Predicting fiscal distress in school districts*. Unpublished doctoral dissertation, Ohio State University.
- Lewis, J., Jr. (1983). *Long-range and short-range planning for educational administrators*. MA: Allyn and Bacon.
- Lynch, R.M. & Williamson, R.W. (1983). *Accounting for management*. New York: McGraw-Hill.
- Martin, D.B. (1987). *Long range planning for school districts*. Westerville, OH: Ohio School Boards Association.
- Martz W.M. & Kami, M.J. (1981). *Corporate planning*. Lighthouse Point, FL: Corporate Planning.
- McCorkle, Jr., C.O. (1977). Information for institutional decision making. *New Directions for Institutional Research*, 15, 1-10.

(References continued - Chapter 3)

Milner, R.G. & Rohrbaugh, J. (1985). Microcomputers and strategic decision making. *Public Productivity Review*, 20, 175-189.

Mitchell, D.E. (1984). Educational policy analysis: The state of the art. *Educational Administration Quarterly*, 20(3), 129-160.

National Education Association. (1984). *Estimates of school statistics, 1983-84 as provided by the state departments of education*. Washington, D.C.: Author, Research Division.

Naylor, T.H. & Thomas, C. (Eds.). (1984). *Optimization models for strategic planning*. B.V. Dean (Ed.), *Studies in Management Science and Systems*, 10.

Nelson D.L. & Purdy, W.M. (1974). *School Business Administration*. Lexington, MA: D.E. Heath.

Plourde, P.J. (1976). Institutional use of models: Hope or continued frustration? *New Directions for Institutional Research*, 9, 17-33.

Pratt, M.J. (1985). *Computerized support for financial planning in South African universities*. Unpublished doctoral dissertation, University of South Africa.

Pratt, M.J. (1986). *What are decision support systems?* Discussion Paper Series No. 51. (Available from Accountancy Department, Massey University, Palmerston North, N.Z.).

Rege, U.P. (1986). Planned incremental package evaluation system. *Financial Accountability & Management*, 2, (1), 25-34.

Sandin, R.T. (1977). Information Systems and Educational Judgment. *New Directions for Institutional Research*, 15, 19-27.

(References continued - Chapter 3)

- Smith, K. (1985). *Forecasting school district fiscal health*. Unpublished doctoral dissertation, Ohio State University.
- Tanner, C.K. (1971). *Designs for educational planning*. Lexington, MA: D.C. Heath.
- Thompson, A.A., Jr., & Strickland, A.J., III (1984). *Strategic management: Concepts and cases* (3rd ed.). Plano, TE: Business Publications.
- Tierney, M.L. (1981). Priority setting and resource allocation. *New Directions for Institutional Research: Evaluation of Management and Planning Systems*, 31, 29-41.
- Updegrave, D.A. (1981). Using computer-based planning models. *New Directions for Institutional Research: Evaluation of Management and Planning Systems*, 31, 61-69.
- Van Dusseldorp, R.A., Richardson, D.E., Foley, W.J. (1971). *Educational decision-making through operations research*. Boston, MA: Allyn and Bacon.
- Whetten, D.A. (1981). Organizational responses to scarcity: Exploring the obstacles to innovative approaches to retrenchment in education. *Education Administration Quarterly*, 17, (3), 80-97.

CHAPTER 4

A LITERATURE-BASED INTEGRATED FINANCIAL PLANNING MODEL FOR SCHOOL DISTRICTS

4.0 INTRODUCTION

The organization, funding, and specific financial issues of school districts are examined in Chapter 2. In Chapter 3 the literature is searched in areas related to planning in general and financial planning in particular. Chapter 3 also examines models which have been designed for and are used in business and tertiary education in order to establish a theoretical base for their applicability to primary and secondary education. The conclusion reached in Chapter 3 is that financial planning models developed specifically to meet school district needs should prove successful in identifying, and perhaps avoiding, financial crises in school districts as well as aiding with decision making.

This chapter will investigate and describe significant prior research concerned with aspects of financial planning specifically related to school districts. Because long range planning and financial planning for school districts is relatively new (Martin, 1987), some of the material examined refers to budgeting rather than financial planning.

Relevant research by Glose (1977), Cardinale (1981), Lee (1982), Smith (1985), Cibulka (1987) and others is examined to discover how their findings impact upon this study of financial planning models for school districts. The integration of planning, financial planning, and modeling is discussed and a normative integrated financial planning model for school districts based on the literature is presented. To assist with the presentation of the model, relevant research is examined to determine which variables affecting financial planning can be influenced by school district decision makers and are important enough to be primary planning variables (PPVs). Exogenous factors are examined to determine which forecasting methods are most appropriate.

Conclusions reached in this chapter, as well as those from Chapters 2 and 3, will be coordinated with original empirical research in Chapters 5 and 6. These will then form the basis of a generic financial planning model designed to meet the specific needs of school districts.

The chapter is arranged as follows:

- 4.0 Introduction
- 4.1 Budgeting
- 4.2 Early Planning-Forecasting-Budgeting Models
- 4.3 Research Most Relevant to School District Financial Planning Models
- 4.4 An Overview of a Literature-Based Integrated Financial Planning Model for School Districts
 - 4.4.1 Mission Statement
 - 4.4.2 Long Term Goals and Objectives
 - 4.4.3 Exogenous Variables
 - 4.4.4 SWOT or SWOP Analysis
 - 4.4.5 GAP Analysis
 - 4.4.6 Strategies
 - 4.4.7 Academic Plan
 - 4.4.8 Financial Plan
- 4.5 Input-Output Analysis in Public School Education
- 4.6 Dynamic Planning
- 4.7 Literature-Based Primary Planning Variables (PPVs) and other Variables for an Integrated Financial Planning Model
 - 4.7.1 Methods of Varying PPVs
- 4.8 Uncertainty
- 4.9 Optimization
- 4.10 Forecasting Exogenous Variables
 - 4.10.1 Enrollment Forecasts
 - 4.10.2 Enrollment Forecasts and Building Needs
- 4.11 Sub Models
 - 4.11.1 Enrollment Forecasting Sub Model
 - 4.11.2 Staffing Sub Model
 - 4.11.3 Financial Planning Sub Model
- 4.12 Summary
- 4.13 Conclusions

4.1 BUDGETING

"In education, financial planning is usually thought of as a component of operational or tactical planning. This is far from the truth. Plans must be devised on a long-term basis to expend those funds in the most efficient manner" (Lewis, 1983, p. 70). While most planners agree with this statement, little evidence is available which suggests that long range financial planning is conducted currently in school districts (Cibulka, 1987, p. 15). For this reason, school district budgeting and the budgeting process will be examined to see how this process can be integrated into a long range financial planning process.

The incremental budgeting model is probably the most widely used in school districts, and it worked well during a period of expansion (Jordan & Webb, 1986). With the incremental model, negotiations occur over how much will be added to a base, not the value of the base itself. "Evaluation of ... performance is avoided by concentrating on the increment" (Cibulka, 1987, p. 8). Another reason for the continued popularity of incremental budgeting is that the very complexity of budgets necessitates innumerable calculations and decisions. Decisions which involve comparisons of current programs and can lead to confrontation can be avoided by incremental budgeting. Davis, Dempster and Wildavsky (1966) state that "outside the political process, there is no agreed upon way of comparing the merits of different programs for different people whose preferences vary in kind and in intensity" (Davis, et al., 1966, pp. 530-531). "Budgets are almost never actively reviewed as a whole in the sense of considering at once the value of all existing programs as compared to all possible alternatives" (Davis, et al, 1966, p. 529).

Classic incrementalist budget studies agree that "budgeting is a stable process in which individual allocative decisions are sufficiently independent of one another so that trade offs are only implicit, and conflict is thereby minimized" (Gist, 1976, p. 859).

Where budgets are increasing in aggregate terms, conflict may be reduced because all receive more total dollars. Nevertheless, it would strain credulity to argue that competition and trade offs do not occur in the context of increasing budgets (Gist, 1976, p. 862).

Iannaccone and Lutz (1970) stress that school boards want to avoid conflict and that they thrive on consensus. As a result, incrementalism has been an acceptable basis for budgeting.

The first involvement of many current school business administrators in fiscal management and resource allocation was during a period of enrolment growth that called for incremental planning and budgeting ... However, little research is available to assist the school business administrator in making wise allocation decisions during a period of decline (Jordan & Webb, 1986, p. 181).

Budgeting is a necessary part of financial planning. Therefore, annual budgets should be developed to agree with the first year of a financial plan (Cibulka, 1987, p. 12).

4.2 EARLY PLANNING-FORECASTING-BUDGETING MODELS

Attempts were made during the 1960s and 1970s to implement various planning, forecasting, and budgeting models into school districts. Chapter 3 describes those school district planning, programming, budgeting systems (PPBS) which were surveyed by Kiser, Lenchyshyn and Douglas in 1976 (Glose, 1977). Although the word "budgeting" is part of the name, the planning and programming parts of the systems were designed to be extended for five or more years beyond the annual budget. Good educational managers had used some parts of PPBS in the decision-making process for years, but few had attempted to implement all of the segments (Van Dusseldorp, Richardson, & Foley, 1971).

PPBS have been described as one way an organization can respond to declining revenues by "altering the mix of educational services" (Whetten, 1981, p. 82) rather than just cutting back all programs. But Cardinale notes in 1981 that as far as school districts are concerned, there is a "relative dearth of PPBS articles in recent education literature compared to a decade ago" (p. 24). This may mean that PPBS is being used less frequently in school districts now than formerly.

Although complete PPBS are few in the 1980s, the basic principle of these systems - integrating academic goals with financial planning - is still valid. A

decade ago Glose (1977) pointed out that the small amount of school district planning being performed was fragmented and unsophisticated although the theories and techniques necessary to alleviate the problem were being developed. Martin (1987) admits that ten years later long range planning is still relatively new to school districts, and Cibulka (1987) states that urban districts facing both declining enrollments and decreasing resources are notably lacking in any kind of multi-year financial planning. Thus, research which can assist school district decision makers with long range academic and financial planning is shown to be important.

4.3 RESEARCH MOST RELEVANT TO SCHOOL DISTRICT FINANCIAL PLANNING MODELS

The studies found in the literature that are most relevant to financial planning models for school districts are those by Glose (1977), Cardinale (1981), Lee (1982), Smith (1985), and Cibulka (1987). They will be discussed individually below.

Glose - 1977

Glose (1977) developed a detailed long range financial planning-forecasting model with the following inputs:

- Curriculum
- Enrollment
- Staffing
- Non-Staffing
- Revenue

Curriculum and enrollment projections are inputs to both staffing and non-staffing projections which, in turn, are inputs to revenue projections. The time horizon for this model is five years, and forecasting is basically straight line. The model is described as time-series and does not utilize higher level statistics. Complicated statistics are avoided in order to limit the uneasiness which many planners feel when dealing with models which they themselves have not developed. Glose suggests using the root mean square error (RMSE) to test for reliability of projections but states that the accuracy of the

model is secondary to the discovery during the forecasting process of problems which must be solved.

The introduction to the model outlines some specific items which should be considered when forecasting enrollments. These include building and economic patterns in the district, the status of non-public schools, new roads, plans for integration and national trends in education (Glose, 1977).

The model assumes few or no changes in curriculum; however, an example of how to calculate the effect of a program change is shown in an appendix. The enrollment section suggests that percentage increases in student enrollment for each grade be forecast by the district or that the cohort survival ratio method be used.

Staff salary and fringe benefit projections are the most important since they represent approximately 84% of the average school district's operating expenditures in the State of New York for which this model was designed. (This percentage would vary among school districts throughout the nation, but would always be the largest expenditure item.) Each teacher's salary is determined by her/his education and years of teaching experience. Individual teacher's salaries are aggregated by showing each teacher's position on a scattergram. Average salaries are then determined by the number of positions indicated for each salary on the scattergram. Separate scattergrams are completed for primary and secondary teachers. Projections are then made for both teachers and administrators in elementary schools, secondary schools, ancillary instructional staff, and non-instructional staff.

Any one of three procedures for developing salary-related projections is recommended: (1) simple regression analysis (preferred method in this model), (2) breaking down the total into base salary and individual fringe benefit costs before figuring increases, or (3) adding a percentage increase to the total base costs each year. Although a "what if" scenario based on various salary increases is suggested, this model is designed to be completed manually, and the exercise would be quite time-consuming. Fringe benefits are projected using different aggregations depending on the date each person was hired.

For non-staffing projections it is recommended that separate percentage increases be used each year for enrollment fluctuations and for inflation. Non-staffing projections are calculated on line item accounts and then totaled.

In New York State "a district's total revenues must always equal its total expenses" (Glose, 1977, p. 194), so the totals in the expenditure sections are added together if a total revenue figure is desired. Total revenue may also be estimated by using simple regression analysis. Revenues are computed only to check the "reasonableness" of the staffing and non-staffing projections.

Cardinale - 1981

Cardinale (1981) developed a generalized personnel-fiscal management system to provide information generally unavailable to school district decision makers. One of his assumptions was that school districts had some means to prepare and retrieve data from a mainframe. While this management information system (MIS) is not suitable for financial planning by itself, some of the observations discovered in Cardinale's empirical work are of interest. He found that "planning tasks were described by interviewees as overwhelmingly related to the current and next fiscal years" (p. 156), not long range. He also discovered that the annual budget preparation was the "major fiscal planning task".

The development of the staffing budgets was found to be dependent mainly "on two factors: pupil population and educational program offerings" (Cardinale, 1981, p. 157). Some other significant factors relating to expenditures were "personnel compensation, pupil-teacher ratio, ratio of staff to support personnel, age and condition of physical plant" (p. 157). The financial impact of curriculum changes were found to be a matter of concern for vocational schools because of the heavy capital costs involved. Other school districts did not find curriculum changes affected finances except in relation to changes in enrollment.

Several of the school districts in Cardinale's (1981) empirical study had declining enrollments severe enough to warrant closing of buildings, reallocation of staff, and modifications to the transportation system. All of these changes influenced the school district budget, but the financial impact on

future years was not mentioned. Multi-year planning, including financial planning, was discussed only with respect to capital equipment and facilities. Unlike other states, in the State of Massachusetts special citizens' committees are established when new school buildings are to be constructed. These citizens' committees design, finance, and construct school buildings totally independent of the school board.

When Cardinale (1981) undertook his empirical study in Massachusetts, school boards in that state had the power to override any opposition to their annual fiscal requirements. Therefore, resources were equal to estimated expenditures. However, "the passage of legislation intended to limit real estate tax levies and the elimination of fiscal autonomy for local school boards" (Cardinale, 1981, p. 201) is likely to lead to greater scrutiny of school district expenditures in the future.

Lee - 1982

Lee (1982) examined the 1980 fiscal records of Ohio school districts to determine if these data could predict which districts would need to borrow from the Emergency School Assistance Fund (ESAF) the following year. (School districts in Ohio may not close because of lack of funds, are fiscally independent, and are required to borrow from the state if no other lender is available.) Lee (1981) based his study on an earlier one by Murphy prior to 1980 (cited in Smith, 1985) which also attempted to identify the variables which characterized financially troubled districts.

For his model Lee used multiple discriminant analysis with a qualitative dependent variable - distressed or non-distressed districts. Five of the thirty three ratios examined were found to be predictive and could forecast fiscal distress a year in advance. Of the five, liquidity was the major early warning sign of fiscal distress, and the district's investment earnings as a percent of total operating funds was another. Salaries, wages, and fringe benefits ratios were also predictive indicators.

Interestingly, neither expenditures per pupil nor elevated staffing ratios were found to be predictive variables in this study. (See Cardinale (1981) above for

a contradictory finding.) Other non-predictive variables were trend ratios and borrowing and/or loan repayment.

Smith - 1985

Smith (1985) used all of the 616 school districts in the State of Ohio as a base to build a model similar to that of Lee (1982). However, this model used "fiscal health", a quantifiable amount, as the dependent variable. Absolute fiscal health is defined as "true cash balance (at year end) less ESAF (emergency school assistance fund) and tax anticipation note receipts" (p. 21) not repaid before year end . In other words, fiscal health is the cash balance at year end which is not encumbered or owed to any other organization. Data concerning fiscal health for the years 1980 through 1983 were obtained from the cash flow reports (Form SM2) required of all school districts in the state. Independent variables were required to meet the following criteria:

1. its numerical value must be capable of being changed by local decision makers;
2. its potential usefulness (in making forecasts) is indicated by relevant literature;
3. the data used to compute it must be readily available and accurate (p. 84).

The research shows that the five most important indicators of school district health are, in descending order:

1. personnel costs;
2. local receipts;
3. liquidity;
4. purchased services; and,
5. investment earnings (p. 140).

Weak predictors, when considered with other variables examined, are, in descending order of importance:

1. material, supply and textbook expenditures;
2. capital outlay expenditures;

3. voted and effective millage (tax rates stated in mills per dollar of assessed valuation); and,
4. capital project fund indicators (p. 140).

Smith (1985) also found that these variables maintain their order of importance (or weakness) "irrespective of the prognostic period" (p. 140). An unexpected finding of the study suggests that "local receipts, and hence fiscal health, was largely due to a district's assessed valuation and not to the district's tax rate" (p. 146).

The recommendations of this study for local decision makers emphasize the "necessity of managing personnel costs to keep their inevitable increases within the bounds of the district's fiscal resources" (p. 143).

Cibulka - 1987

Cibulka's (1987) case studies of ten urban United States school districts during the 1980s show little evidence of planning or budgeting even after a decade of public pressure to dramatically improve fiscal controls. The study describes each school district's reaction to decline and shows how neither rational nor political budgeting systems can explain their responses. Cibulka (1987) found little evidence of multi-year planning or financial planning during the research.

Cibulka (1987) argues that traditional rational models alone are not appropriate and advances the outlines of a theory of his own which incorporates political phenomena. Cibulka's theory is not clearly defined, and there is no indication of how it can be implemented. None the less, Cibulka has contributed greatly to the literature with his empirical work which shows the need for financial planning in United States school districts.

Conclusions

Prior research in financial planning for school districts is varied and affects several different areas. Glose (1977) presents the only complete financial planning model, and aspects of it are helpful for designing the developed integrated financial planning model in this research.

Additionally, Cardinale (1981) supports Glose's (1977) emphasis on enrollment as the most important factor for determining personnel costs but also includes academic planning as a critical factor. Lee (1982) and Smith (1985) identify the factors which predict school district fiscal health. All of the factors identified through prior research are incorporated in the literature-based integrated model developed below. Those areas of school district financial planning which are not addressed in the literature are delineated in Section 4.13 (pp. 148-150) and are subjects of the author's empirical research.

4.4 AN OVERVIEW OF A LITERATURE-BASED INTEGRATED FINANCIAL PLANNING MODEL FOR SCHOOL DISTRICTS

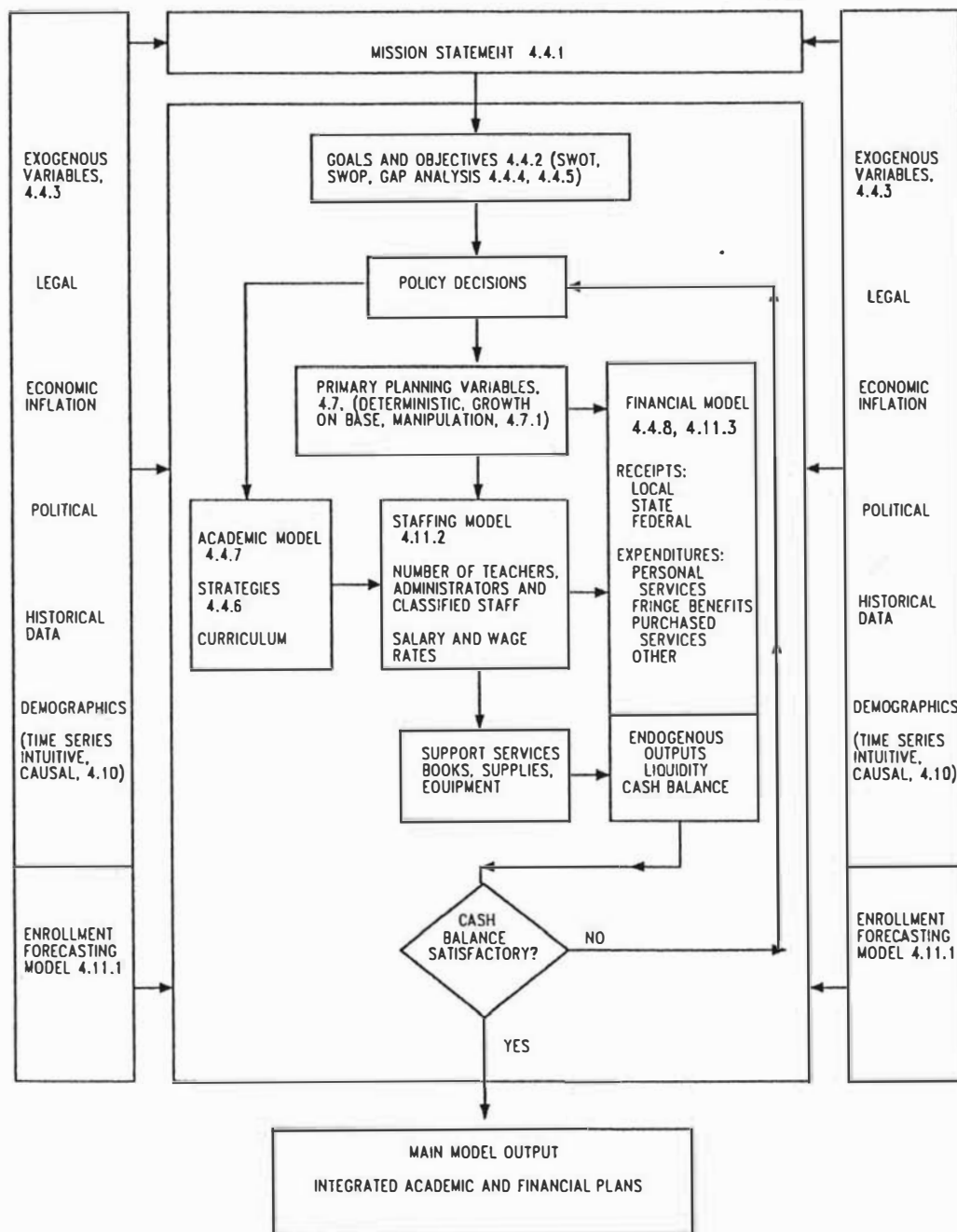
It was shown in Chapter 3 that an effective long range academic plan should be integrated with financial planning to provide adequate resources to carry out goals and objectives of organizations. The model should also provide a complete academic and financial picture of the organization to aid with decision making. Most educational planning researchers acknowledge this need. For example, school district planning researchers have written

To set goals without planning for financing is like trying to operate a vehicle without fuel ... Plans must be devised on a long-term basis to expend those funds in the most efficient manner (Lewis, 1983, p. 70).

... each objective should be subjected to an appropriate cost/benefit analysis ... the existence of limited resources actually increases the importance of long-range planning ... the nature of long-range planning, however, makes it difficult to anticipate its full financial impact ... must be flexible ... (Martin, 1987, p. 19).

This section describes the components of an integrated planning and financial planning model for school districts to assist with decision making and long range planning. A schematic of a literature-based integrated financial planning model derived normatively for school districts is shown in Figure 4-1.

FIGURE 4 - 1
AN INTEGRATED FINANCIAL PLANNING MODEL



* The Numbers refer to the section within this Chapter where detailed discussion occurs.

The entire model is developed from the mission statement. This statement is influenced by external forces over which the school district has no control. These external, or exogenous, variables also affect the entire model.

4.4.1 MISSION STATEMENT

Educational planning usually begins with a mission statement, sometimes called a statement of philosophy. This statement, once adopted by the school board, rarely changes over time. For example, a mission statement may be as simple as the following:

It is the mission of the Blank schools to provide quality educational opportunities for all students in the district's schools to help them become productive members of a changing society (Budget Document, 1988, p. 1A).

A statement of philosophy may be more specific and contain statements such as the excerpts quoted below:

We believe that education is the process whereby society utilizes its knowledge of learning to develop each individual to the highest degree possible as an individual and as a valuable member of a democratic society.

... For effective learning in school, the following conditions must be met: The purpose of the learning activity must be clearly defined ... and the learning itself must be related to the needs of the student.

... Our goal is to provide each child the opportunity for growth as an individual ... and to achieve these ends, we must provide both curricular and extracurricular activities.

... The nature of our changing society requires that we develop individuals who are perceptive, can exercise critical thinking, and make logical decisions.

Finally, because we believe that this society provides maximum opportunity for all, we must develop citizens who will be able to preserve the fundamentals of the democratic way of life (Five Year Plan, 1987, pp. 6-7).

4.4.2 LONG TERM GOALS AND OBJECTIVES

Long term goals are similar to mission statements in that, once adopted, they rarely change. Although they may be modified, the course towards which their goals direct the school district is rarely altered. Objectives are usually more specific and contain some indication of the time needed to achieve them. The terms goal and objective are, unfortunately, often used interchangeably.

Kami (1979) suggests that the first time an organization considers objectives it should be an emotional experience, not necessarily logical or analytical, and that objectives should represent the best that can be imagined. It should be understood that in subsequent meetings objectives will be adjusted to the realities of the situation. "Ultimately, objectives must be challenging, but logical; unemotional, and practically attainable" (Kami, 1979, p. 7). These are the kind of objectives which school boards should ultimately adopt. Objectives should be prioritized, state the time expected to achieve them, indicate the form of evaluation to determine when the objective has been accomplished, and include an estimate of any additional resources needed to reach the objectives (Martin, 1987, pp. 15-16).

The following are four examples of different approaches to goals and objectives. The first example is of a planning goal and an objective; both of them have been prioritized and are designed to support the mission of a school district.

Planning Goal 3

(Devise) Methods to meet the current and future needs of students.

Priority 3.1

(Institute) Drug and Alcohol Education and Counseling
(Budget Document, 1988, p. 6A).

The goal shown above is broad, and the objective is specific. No time limit or estimate of additional cost to the district are mentioned in this objective, although the strategy designed to fulfil this objective (see below) does recognize that there are time constraints. If the objective can be reached with no additional cost (e.g., drug and alcohol education will comprise a unit in an established health program), this should be stated. Otherwise, an estimate should be made of the additional resources needed.

The second example is a short term objective related to a long term goal.

Long-Range Goal: To reduce staff illness absences from 11.5 to 4.0 percent by June 30, 19x3 (three years).

Short-Range Objective: To reduce staff illness absences from 11.5 to 8.5 percent by June 30, 19x1 (one year).

Short-Range Objective: To reduce staff illness absences from 8.5 to 6.0 percent by June 30, 19x2 (two years) (Lewis, 1983, p. 139).

The base number of the two year objective would be adjusted at the end of year one to reflect actual percentage reduction in staff illness absences. Presumably these objectives will not add additional costs to the district but will result in a saving of the cost of substitute teachers. Estimating the savings would enhance the objectives.

The next two examples of objectives are the most specific and include an estimate of cost. They also represent two different ways of stating objectives. The first of these examples is action oriented; the second is predictive.

1. Goal: To increase the number of students in the district who are reading on grade level to 50 percent.

Objective: To increase the number of primary students reading on grade level from 19 percent to 29 percent by June 30, 19xx (one year) at a cost not exceeding \$290.00 per student.

2. Goal: To increase the number of students in the district who are achieving on grade level in math to 60 percent.

Objective: By June 30, 19xx (two years), the number of intermediate students achieving on a grade level in math will increase from 35 percent to 45 percent at a cost not exceeding \$350,000 (Lewis, 1983, p. 137).

To work toward their goals, school districts should examine the gaps between current programs or objectives and future objectives and then design strategies to fill the gaps. But prior to that examination, they should look at exogenous factors which will control the environment of the future.

4.4.3 EXOGENOUS VARIABLES

Exogenous variables are factors in the external environment over which school districts have little or no control, but which influence the ability of school districts to operate. Exogenous factors include legal requirements, demographics, state of the economy, inflation rates, assessed valuation of property, state education minimum standards, federal programs and others. In addition to these, and of particular interest to school districts, are local birth rates, percentage of working mothers, facilities for preschoolers and/or after school care, and non-public schools. In the past, changes in the external environment were often neglected by school districts while they concentrated on their own academic programs (Lewis, 1983). However, all of the exogenous factors mentioned above have been the subject of rapid changes

during the past decade, and there is every reason to believe that they will continue to change rapidly in the future. A continuous, detailed, systematic analysis of these factors and their effect on school districts should be part of the planning process. Forecasts of these factors should be as accurate as possible and should reflect the most reliable information available. A flexible planning program will allow for varying forecasts of these factors. Such flexibility allows for examination of various possible environments within which school districts must function (Lewis, 1983).

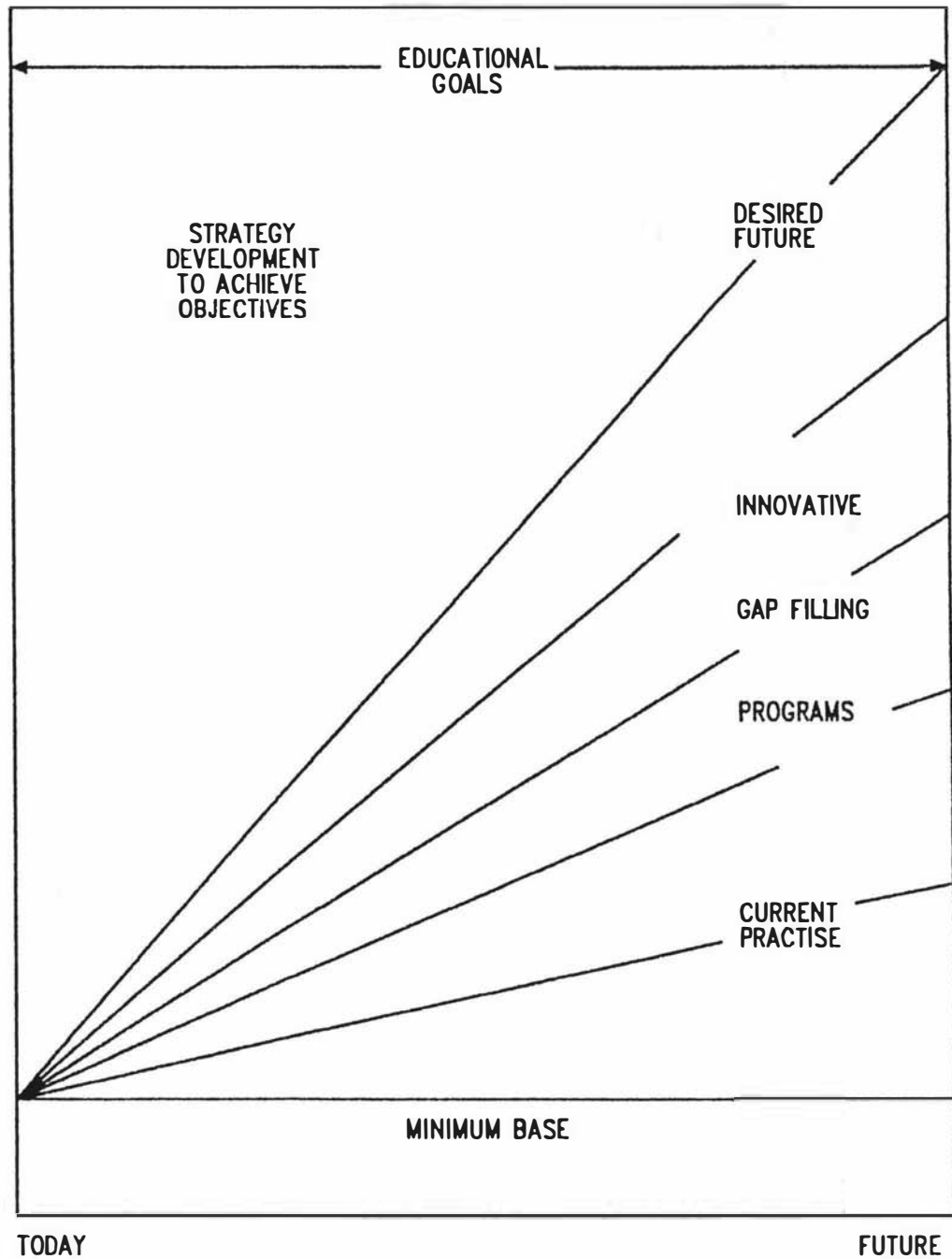
4.4.4 SWOT OR SWOP ANALYSIS

In addition to the exogenous factors, a school district must examine its past and current environments. This type of examination must be realistic and should include all areas of the district. Sometimes referred to as the SWOT or SWOP approach, this type of examination is an identification of an organization's strengths, weaknesses, opportunities, and threats, or problems. The object of such an approach is to define strategies, build on strengths, take advantage of opportunities, avoid or overcome weaknesses, and turn threats or problems into opportunities (Lewis, 1983, pp. 39-40). Strengths and weaknesses should also be examined for relevance and importance. An excellent woodworking or Latin program, for example, is only relevant if there are students interested in studying the subject, and the district can afford to offer it.

4.4.5 GAP ANALYSIS

The differences between current practice and future goals and objectives are sometimes referred to as gaps. These can be analyzed by comparing projections of the future based on no internal changes with projections of the future if strategies are implemented to reach stated objectives. Projections of current practice indicate what the district will probably be like in the future if nothing is changed. Districts facing reduced resources, increasing enrollments, failed levies, or other indications that "business-as-usual" cannot be supported in the future, should establish minimum "base line" projections based upon elimination of programs or services at or near the bottom of the district's priority list. Projections of the future based on reaching educational goals indicate the "desired" future. The gaps between what is (current practice) and what is desired (goals) should be filled with creative, innovative programs or strategies which can be funded. Figure 4-2 shows a gap analysis model adapted for a school district based upon Kami, 1979.

FIGURE 4 - 2
GAP ANALYSIS MODEL



BASED ON KAMI'S (1979) MANAGING THE FUTURE, p. GAP-8

4.4.6 STRATEGIES

A strategy in educational planning involves weighting information to maximize resources for educational gains after considering both the external and internal environments. There are many different approaches which can be used to determine strategies. Several of them are detailed in Lewis's (1983, pp. 112-118) discussion of selecting program strategies. Among those listed are the following approaches:

- * guideline (based on an instrument used to analyze alternatives),
- * planagement (based on collection and analysis of pertinent information, an approach produced by Robert M. Randolph and cited by Lewis, 1983, p. 114),
- * SWOP (see section 4.4.4), and
- * investigative (examination of results of successful strategies and the resources used to achieve them) (Lewis, 1983, pp. 112-118).

They all involve some analysis of historical data, judgement of desired results, and choice of alternatives to determine what actions are necessary. An example of a strategy to meet one of the goals and objectives cited previously is as follows with the goal and objective repeated here for the reader's convenience. The researcher's additions and comments are shown in the square brackets.

Planning Goal 3

[Devise] Methods to meet the current and future needs of students.

Priority 3.1

[Institute] Drug and Alcohol Education and Counseling.

Strategies

The secondary drug and alcohol counseling program should [will] be further refined and evaluated [by the Substance Abuse Committee on a continuing basis. No additional resources are needed].

The total K-12 drug and alcohol counseling and education program will be designed [by the Substance Abuse Committee under the direction of the assistant superintendent] to include a component which stresses involvement of the community and related resources within the community. [After adoption by the board, the program will be implemented at the beginning of the next school year. Three thousand dollars for secretarial assistance is provided in next year's budget.]

[Because it is deemed to have higher priority,] the decision to enhance instruction in human sexuality and AIDS education will

cause a delay in the design and implementation of a plan to involve parents of District students in drug and alcohol education and counseling. [These plans will be finalized, adopted by the board and put into action by the Substance Abuse Committee and the assistant superintendent during the fall of 1988.] This activity will now occur during the fall of 1988 rather than this spring. Plans to involve parents may [will] be broadened to include an emphasis on human sexuality and Aids education as well. [This program will involve no additional costs to the district.] (Budget Document, 1988, p. 6A).

An additional example of an appropriate strategy selected to meet another of the goals and objectives stated previously is shown below.

Long-Range Goal: To reduce staff illness absences from 11.5 to 4.0 percent by June 30, 19xx (three years).

Short-Range Objective: To reduce staff illness absences from 11.5 to 8.5 percent by June 30, 19xx (one year).

Short-Range Objective: To reduce staff illness absences from 8.5 to 6.0 percent by June 30, 19xx (two years) (Lewis, 1983, p. 139).

Strategy:

Establish a method for recording, collecting, and analyzing staff absences. Use Hertzberg motivational approach to improve behavior. Make use of positive reinforcement and recognize excellent attendance (Lewis, 1983, p. 305).

Lewis (1983) lists a number of reasons why even well developed program strategies in school districts fail. Shown below are his list of reasons with comments describing the main points of his explanation.

- * failing to respond to major stakeholder (community groups, parents, etc.) expectations,
- * failing to consider the competition (private schools),
- * failing to identify planning assumptions (see Chapter 3),
- * failing to profit from the past (blame the pupils, instead of the programs, if they fail to learn),
- * planning for too much too soon (start the planning process slowly),
- * mismatching human resources and strategies (failure to train staff for new programs) (Lewis, 1983, pp. 119-121).

Like every other phase of planning, strategies should be prioritized. They should, like the objectives themselves, be consistent with the mission

statement and forecasted external and internal environments. Lewis (1983) does not include the costs of implementing objectives and strategies among the reasons they sometimes fail. This failure to take costs into account while developing objectives and strategies is typical of academic planning. Although many authors recognize the importance of budgeting, financial planning, fiscal problem resolution, and adequate funding, they rarely devote more than a paragraph or two to the subject. Integrating academic and financial planning should enable school districts to use their resources to finance their most important objectives and strategies thus realizing their academic plans.

4.4.7 ACADEMIC PLAN

The academic plan, often referred to in school districts as curriculum, reflects the academic programs to be altered, added, or deleted according to the strategies developed. It identifies areas where additional resources are needed for both current and new programs as well as the resources which will be available for other uses when programs are discontinued. Of course, the most important and costly additional resources to be considered are new staff and/or new classrooms and equipment. Integration of the academic plan with the financial plan will identify the long term cost of program changes.

4.4.8 FINANCIAL PLAN

Forecasting revenues is the most difficult area of financial planning since the factors which determine revenues are, for the most part, exogenous ones. School districts which have levies coming up for a vote during the years for which planning is being undertaken are advised to develop two plans, one anticipating levy passage and one providing for levy failure. Two financial plans should also be prepared for any year when large amounts of estimated revenues are in doubt (e.g., new state foundation system; change of state administration; large industrial company moving in or out of the district; budget increases requiring voters' approval).

In an integrated financial planning model the expenditure elements of the financial plan should be developed in conjunction with the academic plan. School districts which find it necessary to prepare two financial plans will, therefore, also prepare two academic plans thereby assuring that the academic plan adopted has sufficient funding.

4.5 INPUT-OUTPUT ANALYSIS IN PUBLIC SCHOOL EDUCATION

Input-output analysis is a technique designed to examine the output of a system when the variable inputs are changed. Cohn and Millman (1975) surveyed the development of the educational production function (output) for elementary and secondary education in the United States and summarized the major studies using input-output analysis. The emphasis is placed on studies utilizing production functions based on simultaneous equation systems (Cohn & Millman, 1975, pp. 31-46). Some of the inputs used in more than one of the 23 studies are class size, student-staff ratio, teachers' experience, teachers' salary, teacher turnover, school building size or age, library and textbook supply. Outputs are evaluations of pupil performance usually measured by standardized achievement tests, verbal ability tests, reading ability, school holding power, or students going on to higher education. There is a lack of consistent results from the studies; however, the authors point out that some school components (inputs) have been shown to have a positive influence "in a number of places and at a number of times" (p. 47). Those components are teacher experience, salary, and facilities.

Averch and his associates (quoted in Cohn & Millman, 1975) conclude after reviewing these and other existing studies:

Research has not identified a variant of the existing system that is consistently related to students' educational outcomes (p. 47).

They state that the answer lies not in giving up educational research but in "refining measures of cognitive ability ... non-cognitive functioning ... better data collection ... and more sophisticated data manipulation and analysis" (p. 48). Perhaps the largest and most controversial of input-output studies is the Coleman report published in 1966 (discussed in Cohn & Millman, 1975, pp. 37-38). It was criticized for the choice of measurement and handling of data. Many contend that the manner in which the regression technique was used made any strong showing by the school factors difficult to determine.

Stepwise regression requires the statistical assumption of independence of variables ... Where such independence is not present ... the first variables to be entered (in this case nonschool factors) will appear most potent ... In fact, the nonschool and school factors may be so nested within each other that their effects cannot be so arbitrarily separated (Cohn & Millman, 1975, p. 37).

An input-output educational model was developed in 1971 using data from 53 Pennsylvania secondary schools (Cohn & Millman, 1975). It used the most extensive number of inputs and outputs ever analyzed in a simultaneous-equation context. The 31 input variables listed as examples of those used in the model is only a subset of the Pennsylvania Department of Education data which were used. Other input variables (nonschool) are compressed into a set of four socioeconomic variables. Not all input variables are used in every analysis. Output variables are related to twelve goals which are interactive and feedback (or input) into other models.

... endogenous (output) variables were chosen in a given equation when they appeared to have relatively high correlations with the respective dependent variable - provided, however, that an a priori argument could support their inclusion in the model (Cohn & Millman, 1975, p.61).

Specifying the set of exogenous variables "was influenced by the desire to investigate as many of the instrumental (manipulative) variables as possible" (p. 61). The authors observe that while "non-school variables contribute a large portion of the explanatory power of the model, it is equally beyond question that school related factors are also important" (p. 75). The authors suggest that changes in the internal reallocation of resources within schools might affect changes in output (pp. 76-77). They also state that the main thrust of the analysis is that when comparing schools, those "with different input levels ought to expect different output levels" (pp. 78-79). Cohn and Millman (1975) conclude, however, that "regression analysis only describes the educational production process, and does not explicitly account for managerial objectives and constraints" (Cohn & Millman, 1975, p. 91).

Mathematical programming is recommended by Cohn and Millman (1975) for modeling the decision making process for managerial objectives. Although linear programming is the most widely used mathematical technique, goal programming may be more relevant. Goal programming is described as follows:

Goal programming is a special type of linear programming. In linear programming only one goal can be incorporated into the objective function to be maximized or minimized. In goal programming more than one goal can be incorporated into the objective function. Environmental conditions such as resource availability are put as constraints. Each goal is set at a level desired by the decision maker. This level need not be the best possible one, and it may or may not be attainable due to the limitations of available resources. Goal programming will provide

the set of x values that satisfied the constraints and comes closest to the targets of the decision maker as represented by the stipulated levels of the different goals" (Cohn & Millman, 1975, p. 93).

One of the conclusions reached in this study is that "the technique of goal programming is particularly suitable for implementation at the district level" (Cohn & Millman, 1975, p. 97). However, the difficulty of estimating the educational production function (output) is such that large changes in educational manipulative variables (input) based on using this technique are not recommended (p. 97).

Other authors also recommend input-output analysis and linear programming for solving educational problems involving the allocation of resources "in such a way that the outcome is optimized (maximized or minimized)" (Van Dusseldorp, et al., 1971, p. 58). They also distinguish between an "open" system and a "closed" system, the criteria being that an open system is one "exchanging energy with the environment in any form" (Van Dusseldorp, et al., 1971, p. 16). By this definition, school districts are open systems. Input-output analysis has been used extensively in educational research and, therefore, will be used in the literature-based integrated financial planning model presented in this chapter.

When using input-output analysis for integrated financial planning for school districts, all of the above-mentioned items are inputs to the model:

- Mission Statement
- Long Term Goals and Objectives
- Exogenous Factors
- SWOT or SWOP Analysis
- GAP Analysis
- Strategies
- Academic Plan
- Financial Plan

When manipulation of primary planning variables results in satisfactory endogenous outputs (cash balances) of the sub model, the output of the main integrated financial planning model will be integrated academic and financial plans.

4.6 DYNAMIC PLANNING

Hopkins and Massy (1981) discuss deterministic dynamic planning as it applies to colleges and universities in general (p. 228), and Stanford University in particular, as an introduction to their models for transition to equilibrium. Equilibrium is defined as receipts equal to expenditures, and the transition period is the time required to reach equilibrium. The time horizon of Hopkins and Massy's long term model is ten years, and optimization would have to be performed over 150 variables. They conclude that

The extensive form of the dynamic optimization problem does not provide a very practical handle by which to grasp the multiyear planning problem. A more promising method ... is to partition the problem into medium- and long-run components, and deal with the latter in terms of aggregated proxy variables (Hopkins & Massy, 1981, p. 230).

The medium range horizon is limited to where decision makers feel comfortable making year to year estimates or projections based on specific knowledge (3 to 5 years). The long range is based on economic reasoning rather than on specific projections (p. 231). The primary tool used at Stanford University for financial forecasting and tradeoff analysis was designed to allow decision makers control of variables in order to seek their own preferences. It consisted of four basic parts:

- * primary planning variables (PPVs),
- * background variables and parameters,
- * financial routines (including submodels), and
- * constraints (Hopkins & Massy, 1981, p. 389).

These subjects will be discussed below as they apply to school district financial models.

4.7 LITERATURE-BASED PRIMARY PLANNING VARIABLES (PPVs) AND OTHER VARIABLES FOR AN INTEGRATED FINANCIAL PLANNING MODEL

There are hundreds of factors whose values or rates of growth are unknown but which affect financial planning for school districts. Some of these variables

can be manipulated by school district decision makers. Others, exogenous or external variables, are not under the control of the school district. Below is a list of the more important variables which affect school district financial planning.

EXTERNAL ENVIRONMENT - NOT CONTROLLABLE

- Legal requirements - federal, state, local
- Demographics
- Economy - inflation
- Assessed valuation - school district property
- State's contribution to district
- Federal contribution to district

LOCAL ENVIRONMENT - PARTIALLY CONTROLLABLE

- Negotiated agreements with employees
- Building and equipment previously purchased
- Employees' continuing contracts
- Tax rates
- Heat, light, water, telephone
- Non-public education
- Community image
- Other state and local receipts

SCHOOL DISTRICT - CONTROLLABLE

- School board policies and procedures
- Mission statement
- Goals and objectives
- Academic programs
- Staffing
- Transportation
- Extracurricular activities
- Purchased services

(Adapted from Lewis, 1983, p. 88).

Primary planning variables are the input variables on which an integrated financial planning model for school districts will focus. Hopkins and Massy (1981, p. 456) define primary planning variables as the most important of the policy variables which can be changed by decision makers. In this section primary planning variables for school districts will be determined based on the foregoing definition.

Some of the variables which affect the academic plan, such as goals and objectives have been discussed previously and not all of them are repeated here. This section is directed at the financial effect of academic decisions which can be quantified and increase or decrease costs of operating school districts. Wacht (1984) points out that non-profit organizations have two kinds of goals which he calls professional goals and financial goals (p. 35). The

normatively derived financial planning model for school districts being described here seeks to integrate the policy decisions of the professional (or academic) goals with the financial goals of solvency and liquidity (determined by a positive cash balance at year end).

The objective of financial planning in school districts is to seek financial equilibrium (receipts are equal to expenditures) over the long term in order that academic plans have sufficient resources and financial crises are avoided (Smith, 1986, pp. 140-141). For this reason, variables which affect school district fiscal health are likely candidates for primary planning variables. Smith (1985) identified the primary indicators of school district health in the State of Ohio as (1) personnel costs, (2) local receipts, (3) liquidity, (4) purchased services, and (5) investment earnings (p. 140). Some of the indicators which Smith (1985) found were not the most important indicators also meet the definition of primary planning variables and will be included in the model as PPVs (e.g., capital projects, materials, supplies, equipment).

With personnel costs ranked as number one, the variables which determine the number of teachers employed (demographics, academic programs, and pupil/teacher ratio) could be considered as primary planning variables. Demographics, which determine enrollments, is, however, an exogenous variable not controllable by school districts and therefore does not meet the definition of a primary planning variable (exogenous variables will be considered later in this section). Variables which affect personnel costs, in addition to those listed above, are number of administrators, non-teaching personnel employed, salaries and wage rates, and fringe benefits. With the exception of enrollments these variables are under the full or partial control of school district decision makers and may be considered as primary planning variables.

Salary, wage, and fringe benefit indicators is a category of variables that comprises the majority of school district general fund expenditures because of the labor-intensity of the enterprise. This category of expenditures does not lend itself to rapid downward adjustment by school district managers should the need arise to make such an adjustment. It is, therefore, the single most important category to be able to control through long-range planning (Smith, 1985, p. 85).

The reason personnel costs, primarily those costs related to teachers and administrators, cannot normally be adjusted downward is that these employees

have contractual arrangements which may not be abrogated except for specific reasons stated in law. As mentioned in Chapter 2, most teachers acquire continuing contracts after three or four years of teaching, and all administrators have contracts for at least one year, usually longer. Classified (non teaching) employees often have job protection negotiated by unions. All of these contractual arrangements contribute to the need for long range personnel cost planning.

Local receipts are mentioned by Smith (1985) as another of the indicators of school district fiscal health in the State of Ohio. Local tax receipts are important because they comprise almost half of the total receipts in most school districts (Brandt, 1986; National Education Association, 1984). Tax receipts depend primarily upon property tax rates and assessed valuation of property within school district boundaries. However, previously voted and unvoted tax rates are not under the control of decision makers nor are the assessed valuations of property. (Assessed valuations of all property are determined by county auditors as discussed in Section 2.5.1.). The only aspect of tax receipts over which decision makers have partial control is new tax levies because only the school board can put tax levies on the ballot, determine how large those levies will be, and decide whether they will be for a specific number of years or continue to be collected until repealed. The number of dollars needed is determined by the school board, and the county auditor calculates the tax rate which will raise that number of dollars in the first year of collection. Various sizes of levies may be considered by the school board to meet the needs of the district for a specified number of years or the levy may be a continuing one which remains until removed by taxpayers. While tax levies can be placed on the ballot by school boards, the ultimate fate of levies is in the hands of the voters. Therefore, the only aspect of tax receipts which is a PPV is additional tax levies.

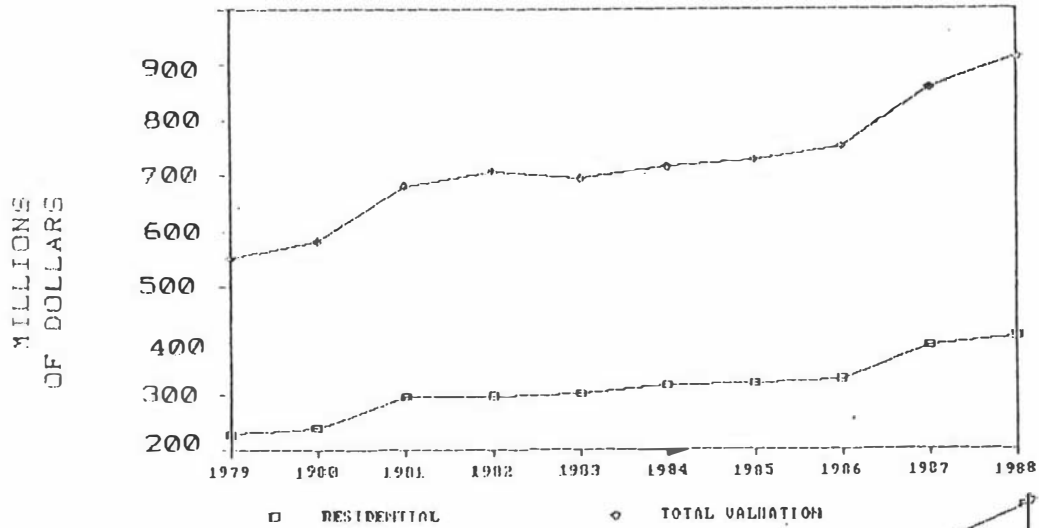
As noted above, the basis for determining school district tax receipts is assessed valuation of property in the district multiplied by tax rates for the district. However, the calculation of taxes has been complicated by legislation designed to prevent excessive tax receipts when the value of property increases dramatically as it did in the 1960s and 1970s. This legislation has taken the form of tax credits which work to offset the increase in tax receipts which would otherwise result from the increase in property values. Whereas school district income previously grew with the increased value of real and

personal property, this growth has been slowed by legislation which limits the dollars collected from voted levies to the dollar amount levied in the first year of collection. States accomplish this by lowering tax rates or by allowing credits to assessed valuation of property which decrease the amount of tax which would be collected if the full tax rate were in effect. The methods of restricting tax receipts depend upon state legislatures. In Ohio, for example, "reduction factors are computed by the State Department of Tax Equalization, then used by the county auditor in calculating property tax bills" (Christman, 1982, p. 19).

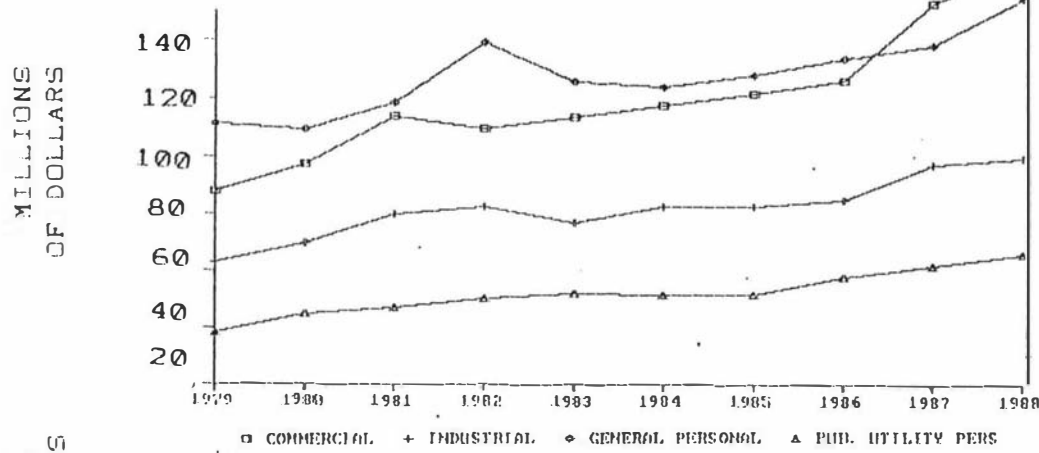
Brandt (1986, pp. 37-40) describes legislation in the State of Ohio which divides real and tangible property into five components, provides for sexennial reassessments and triennial readjustments of all property, and reduces the effects of the growth in property taxes by means of reducing the percentage of assessment on some types of property in addition to credits against taxes levied.

Assessed valuation of property in any school district can fluctuate due to random factors not under the control of school districts (Brandt, 1984, pp. 37-38). Figure 4-3 shows an example of how the assessed valuations of one Ohio school district fluctuated over a ten year period. While assessed valuation has decreased in this district on agricultural (D) and public utility real property (C), it has increased on other types of property such as commercial (B) and residential (A). Examination of total valuation (A) shows the effect of reassessment in 1981 and 1987 and the increase in total valuation because of new commercial and residential property in 1988. An increase in the assessed valuation of property in a school district means more taxes for that district only on the non-voted, or "inside", millage and on new construction.

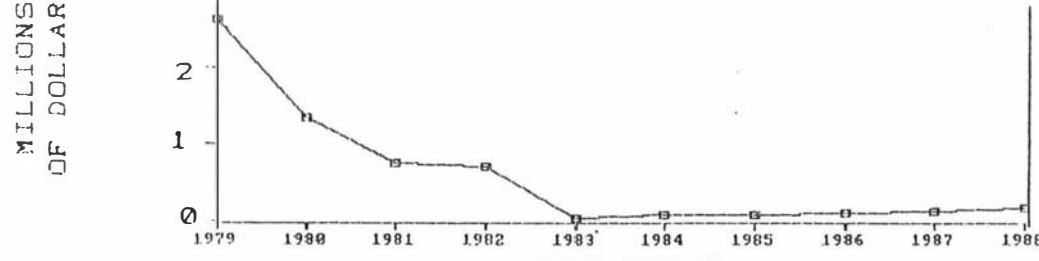
FIGURE 4-3
 EXAMPLE OF ASSESSED VALUATIONS
 OF AN OHIO SCHOOL DISTRICT



A



B



C

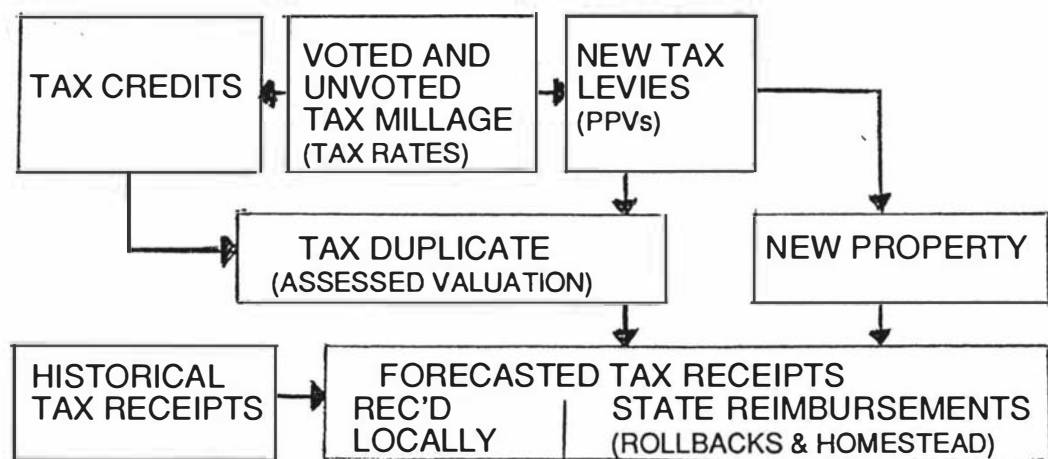


D

□ AGRICULTURAL

The following model shows factors which influence tax receipts and which should be considered by decision makers when using their professional judgment to forecast future dollar amounts of receipts. Each of these influences will be discussed below.

FIGURE 4-4
FORECASTING TAX RECEIPTS



As noted above, tax receipts are a function of tax rates, assessed valuation of property and tax credits. Both voted and unvoted tax millage, or tax rates, affect the tax levied on the tax duplicate. Unvoted millage was awarded to school districts in the State of Ohio several decades ago as part of the ten mill tax base determined by the state legislature. Unvoted millage rarely changes over the years and is not subject to tax credits. All other school tax millage has been voted into existence by the taxpayers of the school district (Brandt, 1986, p. 38). Many school levies were voted as continuing levies which can be removed only by voters; others are emergency levies which are in existence for no longer than five years. Tax credits, which are determined by the state, reduce the amount of tax levied on the assessed valuation of various classes of real (land and buildings) and personal tangible property (machinery, equipment and inventories) multiplied by tax rates. Credits offset increases in taxes which result from higher assessed valuations, except on new property. The interaction of these three factors (tax rates, assessed valuations, and tax credits) is complex and designed to mitigate increases in taxes as property values rise and to eliminate inequities in the tax burden borne by residents and business organizations. Legislation mentioned above has worked to keep taxes levied for school districts in any given year at or near the amount

received the prior year, except for growth attributable to inside or unvoted millage, new construction, and additional tax levies. (Brandt, 1986, pp. 37-38).

As shown in Figure 4-4, tax credits do not affect new construction the first year this property appears on the tax duplicate (list of taxable property); therefore, the full tax rate determines the tax receipts from this property (Brandt, 1986, p.39). For this reason the tax duplicate of each school district should be monitored continually by school administrators to be certain that all new property is recorded promptly and attributed to the proper district.

In some states, the State of Ohio for example, tax credits are not applied equally against commercial and residential property since the values of residential property tend to rise faster than those of commercial or industrial property. Ohio and some other states give additional tax credits to residential or low income tax payers to remove some of the tax burden. These rollback and homestead exemptions decrease locally collected tax receipts but are reimbursed by the state to tax recipients, including schools, as shown in Figure 4-4. (Brandt, 1986, p.5).

New tax levies (PPVs) are collected in full on all property in the first year of collection (Five Year Plan, 1987, p.57). With no other means of increasing income substantially, school districts place levies on the ballot with increasing regularity in many districts. Passage of levies which raise taxes is often in doubt and cannot be forecast; and passage or failure directly affects school district financial planning (Five Year Plan, 1987, pp. 49-51). School districts should plan for both levy passage and levy failure until referendums are completed. The school district used in the example of assessed valuations, for instance, has two forecasts. Unless a five-mill levy is passed in the fall of 1990 for January 1991 collection, their adjusted ending cash balance June 30, 1993 will be a deficit of more than ten million dollars. With passage of the levy, the balance will be almost two million dollars.

Because legislation cited above has kept the growth of tax receipts in individual districts at or near the prior years' receipts (Christman, 1982, pp. 16, 18), historical tax receipts in most communities will give an indication of estimated receipts in coming years. Planners should attempt to forecast the development of new property and the outward movement of large industries over the planning horizon and adjust historical tax receipts accordingly since

these are the best indicators of changes in tax receipts from those received in prior years (Brandt, 1984, p. 39). Because of the large number of random external influences on tax receipts which school district decision makers cannot control, judgmental, rather than mathematical forecasting is advisable. Since tax receipts cannot be forecasted statistically (Christman, 1982, p. 18-21), they are put into the integrated financial planning model as exogenous variables arrived at judgmentally. The only PPV in the determination of local tax receipts is additional tax levies (Section 4.7, p. 120).

Smith (1985) elaborates on an interesting finding related to tax rates and assessed valuation.

Neither voted nor effective rates were important indicators ... (and) ranked last or next-to-last ... This would suggest that local assessed valuation accounts for the importance of the local receipt indicator ... This is certainly a matter that deserves further investigation ... (If) local wealth (as measured by property values) is ... found to be the important determinant of local receipts ... there is little that local decision-makers can do ... their control of the fiscal health of their school district could be significantly diminished ... (Smith, 1985, p. 136).

This current research will not investigate the finding further although it appears to run counter to the belief that voters control the quality of education in any given district by passing tax levies. This would be an interesting subject for further research.

Other factors based on assessed valuation and affecting of property receipts are equal yield formulae in many states, similar to those in the State of Ohio, which base state foundation payments to districts on the assessed valuation per pupil in each school district.

Although the school district will receive more dollars from the state for each additional pupil who enrolls, the equal yield formula will take away dollars as ... valuation increases (Five Year Plan, 1987, p. 52).

Purchased services range from building repairs to utility costs with the latter accounting for an increasing share of these expenditures (Smith, 1985, p. 88). Purchased services are mentioned as an important indicator of school district fiscal health (Smith, 1985, p. 140), and decisions regarding these purchases are under the control of school district decision makers. Although capital projects are not a strong indicator of fiscal health because they represent only

a small part of school district budgets, they too are under the control of decision makers. Both categories therefore qualify as PPVs. The cost of many of these services is greatly affected by inflation; so quantity and mix of purchased services are the effective decisions made by school district decision makers in these categories. The State University of New York (SUNY) at Albany aggregates expenditures, including salaries and wages, into several categories and forecasts separate inflation rates for each of them (Hopkins & Massy, 1981, p. 134). Because decision makers can manipulate these expenditures, purchased services and capital projects are PPVs in the model presented here.

Liquidity and investment earnings are the other two categories identified by Smith (1985) as important indicators of school district fiscal health. They are functions of the timing of receipts and expenditures, the size of the cash balance at year end, the short term borrowing policies of the school board, and the investment policies and procedures of the treasurer.

The liquidity indicators - cash balance and true balance (defined as cash balance minus loans outstanding) - reflect how long a district could operate with just the funds on hand at the end of the fiscal year ... these funds serve as a buffer against unanticipated expenditures, cash-flow problems, and unanticipated drops in receipts (Smith, 1985, p. 84).

The year end cash balance is also necessary to protect the district from late receipt of property taxes. For example, school districts in Ohio receive the bulk of their real property tax in January and July and their personal property tax receipts in October, November, or December (Christman, 1982, p. 9). Since 1985 when school districts in Ohio changed to a fiscal year ending June 30 (also the end of the school year when, historically, school districts in Ohio have the least amount of cash) it is important to have cash to pay bills until tax collections are received (Christman, 1982, p. 6). While short term borrowing (repaid before fiscal year end) is at the discretion of school boards, borrowing over the year end in anticipation of personal property taxes to be received later in the calendar year, requires the approval of the State Department of Education. The importance of the cash balance at year end is recognized by Lee (1982) and Smith (1985) who use cash balance at year end minus loans outstanding to define school district fiscal health. All cash balances are factors in the amount of inactive funds which can be invested for interest earnings; and by their short term borrowing policies, school district decision makers can

manipulate these balances to some degree. Since the cash balance at year end is an important variable under the control of school district decision makers, it could be considered a PPV. However, PPVs have been defined as inputs to a system, and the cash balance is an output, the result of total financial resources minus expenditures. Although in the State of Ohio school districts may not have deficits at year end (they are required to borrow to cover all negative balances) (Christman, 1982, p. 3), there are no requirements as to the size of cash balances. Therefore, the size of year end cash balances can be determined by decision makers.

Given the legal requirement to avoid deficits at year end and the difficulty of passing levies annually, desired year end cash balances could be determined by decision makers and used as constraints in the model. Varying the PPVs and operating the financial planning model iteratively with the year end cash balance as a constraint would help ensure that receipts from new levies allow growth in expenditures over a period of years.

Cash balances at year end are important inputs for the following year. The size of the cash balance will vary from year to year depending upon how long it has been since the most recent levy was passed. For example, the first calendar year after a tax levy is passed, only half of the receipts from the levy will be collected during the first six months (second half of the district's fiscal year). This is because tax receipts from levies are collected beginning with the calendar year following passage of the levy. During the following fiscal years the full amount of the additional tax from the levy will be collected. The cash balance at the end of each fiscal year should be large enough to ensure that another levy is not needed sooner than one can be passed. To achieve long range financial equilibrium or stability over a period of time, cash balances should be carefully controlled.

Smith (1985) notes that "investment earnings are largely a function of a district's liquidity - more specifically, cash-on-hand" (p. 134). Like the cash balance, borrowing policies of the board and investment policies and procedures of the treasurer are under the control of school district decision makers. Liquidity and investment earnings, important indicators of school district fiscal health, are the results of other decisions made in the districts. Lee (1982) found the ratio of investment earnings to total operating funds to be predictive when measuring school district health. This ratio could be used to

forecast investment earnings for future years. An interesting and important research project would be to investigate the ratio of investment earnings to year end cash balances, interest rates and total operating funds.

Although not mentioned by Smith (1985) as an indicator of school district fiscal health, the state of the economy of the district as indicated by the rate of inflation directly affects school districts' financial planning. For example, the rate of inflation affects projected increases in salary and wage negotiations, the cost of fringe benefits, and the purchase of supplies, equipment, and services.

PPVs and exogenous variables can be divided into three types depending upon how they are put into the model. The types are level (numerical), ratio, or growth rate (percentage) (Hopkins & Massy, 1981, p. 390). Level variables are put into a model as specific numbers such as 23 new teachers or \$3M for salaries and wages. Ratios are the comparison of two related numbers. For example, the cost of fringe benefits is directly related to total salaries and wages since both depend upon the number of employees and the amount of remuneration they receive. Growth percentages may reflect the rate of inflation on historical percentage increases in base salary or wage schedules as the result of annual incremental or step increases. The following list summarizes the PPVs which have been identified in this section as important policy inputs which are fully or partially under the control of school district decision makers and shows which type of variable they are.

PPVs	Type
-----	-----
Number of teachers	Level
Other personnel	Level
Teacher/pupil ratios	Ratio
Salaries and wage rates	Level
Projected salary and wage rate increases	Growth
Fringe benefits	Ratio
Purchased services	Growth
Materials, supplies, equipment	Growth
Capital projects	Level
New tax levies	Level
Investment Earnings	Ratio

Other Variables

Exogenous variables in a school district financial planning model are legal, economic (inflation), political, and demographic. As stated above, school districts have little or no control over these factors, although they may try to

influence them. For example, demographics determine enrollments, and school districts have no control over enrollments since they are legally responsible for the education of all pupils residing within their districts. All school district models are enrollment driven. In other words, all school districts' planning models are based upon this one variable, the number of pupils who will be attending public schools. Because the accuracy of the enrollment forecasts (external to the main model) is so important to the forecasts of the main model, an integrated financial planning model should be operated for more than one forecasted level of enrollments. Forecasting exogenous variables will be discussed below in section 4.10.

4.7.1 METHODS OF VARYING PPVs

The PPVs listed above can be varied by several possible methods including the following:

1. deterministic estimation (e.g., estimating an annual staff salary figure),
2. growth percentage from a base figure,
3. normatively or empirically derived ratios (comparison of one variable to another),
4. statistical forecasting (Pratt, 1985, pp. 182-183).

Since no computerized financial planning models for school districts have been found in the literature, it is uncertain at this time which of the above listed methods would be most appropriate for each of the PPVs. Empirical work undertaken to determine if and how financial modeling is conducted in school districts is reported in Chapters 5 and 6 and addresses this issue.

4.8 UNCERTAINTY

Stochastic control has been described as "dynamic control under uncertainty (or) to act in the expectation that even the best current predictions will prove inadequate" (Hopkins & Massy, 1981, p. 537). Studies of financial modeling and decision support systems used in tertiary education describe stochastic modeling (Hopkins & Massy, 1981; Pratt, 1985) but find that "what if" analysis is the most prevalent way of

dealing with uncertainty. Since nothing is known about how school districts deal with uncertainty, this will be investigated as part of the empirical work in school districts and will be reported in Chapter 6.

4.9 OPTIMIZATION

Optimization techniques are discussed by Hopkins and Massy (1981), but were not used in their models. Other authors describe how optimization problems can be solved in educational settings.

In order for an optimization problem to be solved through linear programming, the problem must be of such a nature that it can be described through a series of linear relationships ... The problem ... will not involve finding the single solution but, rather, choosing the best solution from among many possible solutions ... (Van Dusseldorp, et al., 1971, p. 59).

Pratt (1985, p. 184) examines optimization techniques and discovers little evidence of effective operation of goal programming models for university resource allocations, although theoretical studies have proposed their use. He concludes that such techniques are not useful for university financial planning at the current state of development. For this reason, optimization is not built into the school district financial planning model being developed here nor will it be part of the empirical work.

4.10 FORECASTING EXOGENOUS VARIABLES

Forecasts show a set of results that are expected to occur should certain growth rates and other variables be realized. Plans are built by experimenting with different forecasts and choosing the one (plan) that best suits the institution (Hopkins & Massy, 1981, p. 133). Lewis (1983) warns that any mathematical solutions must always be subjected to other information specific to the school district.

Exogenous variables can be forecasted using a number of techniques. The techniques used can be intuitive, time series, or causal (Pratt, 1985, p. 29). All three of these techniques could be used to forecast growth rates of assessed property values within the school district. However, tax receipts are no longer a

simple function of tax rates and assessed valuation of property in the district. In the State of Ohio, for example, because of the complexity of state legislation which restricts school districts' tax receipts, school districts are forced to rely on the estimates developed by county auditors who are entrusted by the state to assess property, apply tax rates, implement restrictive legislation, and collect the taxes (Christman, 1982, pp. 18-21). For these reasons, future real estate and personal property tax receipts will be arrived at intuitively in this integrated financial model. In addition, it is suggested that county auditors be consulted and asked to review forecasts of tax receipts. All school district receipts will be discussed later in this chapter under Section 4.11.3. The following analysis by Glose (1977) suggests that total receipts may be accurately forecasted using simple regression and the results used for comparison with figures arrived at intuitively.

Glose (1977) presents an interesting analysis of the aggregated total revenue of all New York State school districts which reveals a consistent and predictable pattern over a twelve year period. These revenues "form a straight line with a .996 coefficient of correlation when these revenues are related to time in years" (p. 194). A random sample of individual districts showed a similar pattern over thirteen years. The "average individual correlation coefficient for the revenues of these districts over time is .987 and covers a range of .973 to .994" (p. 194). Glose (1977) warns that linear trends are "generally valid only when future consideration (such as enrollment, state aide, the economy, etc.) are like those in the past" (p. 194). The integrated model being designed here will not include statistical forecasting of total revenues. However, forecasted total revenues from the model could be compared with total revenue of prior years to test the reasonableness of the model's forecasts.

There is no way to determine what share of the state's contribution to primary and secondary schools will be received by any particular district. "The issue is clearly beyond school officials' control" (Christman, 1982, pp. 21-22); therefore, state foundation and state categorical receipts will be forecasted normatively. It is suggested that the previous year's receipts from the state be used for the

following years unless reliable indications of an increase or decrease are available.

One area where causal techniques are most appropriate is the determination of the rate of inflation. Since this rate is most difficult to forecast, the use of national trends is recommended (Hopkins & Massy, 1981). The consumer price index (CPI) can be used to separate increased costs over a period of years resulting from inflation and those which reflect increased enrollment (Glose, 1977, p. 159). These rates can be used to help decision makers determine the growth of expenditures. Although school districts have no control over inflation, the effects of inflation on the cost of materials, supplies, purchased services and capital purchases can be mitigated by decisions to purchase more or fewer of the items concerned.

The same reasoning applies to earnings on investments. Regardless of the interest which must be paid on borrowed money or the interest which can be earned from investments, the amount of interest paid or earned is a result of borrowing and investment policy decisions and, therefore, this item should be forecasted using normatively derived percentages.

Because of the difficulties of forecasting the exogenous factors which are discussed above, all of the exogenous variables which are quantified in this financial planning model (with the exception of enrollments) are determined normatively. They are local real estate tax receipts, local personal property tax receipts, state foundation, and other state receipts.

State reimbursements for tax rollbacks and homestead exemptions are the result of tax credits given to home owners by the state legislature. The state's liability is calculated as a percentage of real estate tax receipts. The percentage in this case is not crucial to the accuracy of the model, since the total of the taxes will be received from one or the other of the sources.

Federal funds are not included in the model being described here. For most districts these funds are not significant, and the expenditure of these funds is usually determined before the money is committed. Also expenditures from federal funds supplement but may not supplant other expenditures (Christman, 1982, p. 22).

4.10.1 ENROLLMENT FORECASTS

Enrollment projections are the foundation upon which future academic and financial plans of school districts are built. They must reflect the district (Glose, 1977, p. 100). The size of the areas from which pupils enroll in a given district may be quite small, and local conditions can cause school districts adjacent to each other to have completely different enrollment patterns. While national and state demographics, reflect to some degree on all of the districts in a state, the affect on individual districts may be the opposite of the trend. While the State of Ohio is losing population, for example, some of the school districts in the state continue to grow (Costs Per Pupil, 1986; Five Year Plan, 1987). In addition, while the external environment ultimately reflects on school districts, the time lag between the occurrence of events of state or national significance and their effect on schools is usually long enough for schools to adopt new adaptive strategies. If a district's population is in a state of flux, a house by house census may be necessary. This is probably the most accurate way to forecast enrollment, particularly for the early grades, although an influx of new families with children can make even the first year's projection unreliable. While a census might be considered an expensive undertaking, parent-teacher associations can often be called upon to provide volunteers. All enrollment forecasts must be updated regularly. Leggett (quoted in Glose, 1977, p. 109) suggests monitoring additional sources of information such as local planning boards, county or state birth records, and outside consultants.

Probably the easiest method of projecting future enrollment is by class progression. This method projects autumn enrollments in a given class based on "ratios of (a) the number enrolled in a given class level at the beginning of a given year to (b) the number enrolled in the next-lower class level one year earlier" (Hopkins & Massy, 1981, p. 363). Glose (1977) recommends a similar method of projecting a percentage increase or decrease for each grade based upon the current year's enrollment and that of the same grade for the prior three years. This type of trend analysis can be modified by changing the percentages as the result of local conditions. He also uses a "resident weighted average daily attendance" or RWADA which includes all of the students that live within a district whether they attend public or private schools in or out of the district for prior, current and future years. To check the reliability of the projections, Glose (1977) suggests comparing observed data with the forecasts as they become reality.

The cohort method projects enrollments by classes made up of survivors of various groups, or cohorts, that entered at various times in the past. To obtain the survival rate for grade one, birth rates in the district for the previous nine years are required. The survival rates are established by dividing the first grade enrollment figures for any given year by the resident live births six years previously. Kindergarten enrollment is not used since it tends to fluctuate in most districts (Lewis, 1983, p. 95). For grades other than first grade, the survival rates of previous years (up to four years when available) are calculated, and the most appropriate rate is used to forecast future enrollments for that cohort. Once the survival rate has been established, it tends to remain stable (Hopkins & Massy, 1981). The cohort survival method of forecasting enrollments is preferred by several authors, for example, Hopkins and Massy (1981) and Lewis (1983). Although Glose (1977, p.210) notes that the cohort method is preferred by the New York State Department of Education, he presents it (p.103) only as an alternative, preferring the simpler, less intimidating model presented above. Because the cohort method is preferred by most authors, it is suggested for forecasting enrollments in the literature-based integrated financial planning model presented in this chapter. However, empirical work will be undertaken to discover how school districts currently forecast their enrollments.

4.10.2 ENROLLMENT FORECASTS AND BUILDING NEEDS

In addition to providing the information on which an integrated financial planning model for the general fund is based, enrollment forecasts indicate when additional classrooms will be needed. Accurate projections of enrollments are particularly important when a district is expanding because of the time necessary to construct new buildings. If increased enrollment is a temporary aberration, however, arrangements may be made with other organizations such as churches or YMCAs to provide temporary classrooms. Overbuilding can cause political problems when school buildings are no longer needed and must be closed and sold. Community pressure to keep neighborhood schools open can lead to unwise use of resources (Cibulka, 1987, p. 24). As stated previously, money for the construction of new buildings is usually kept in a special building fund, not the general fund. The general fund does, however, provide for equipping, staffing, and operating new buildings.

4.11 SUB MODELS

The integrated financial planning model incorporates four sub models for

- (1) enrollment forecasting,
- (2) academic planning,
- (3) staffing, and
- (4) financial planning.

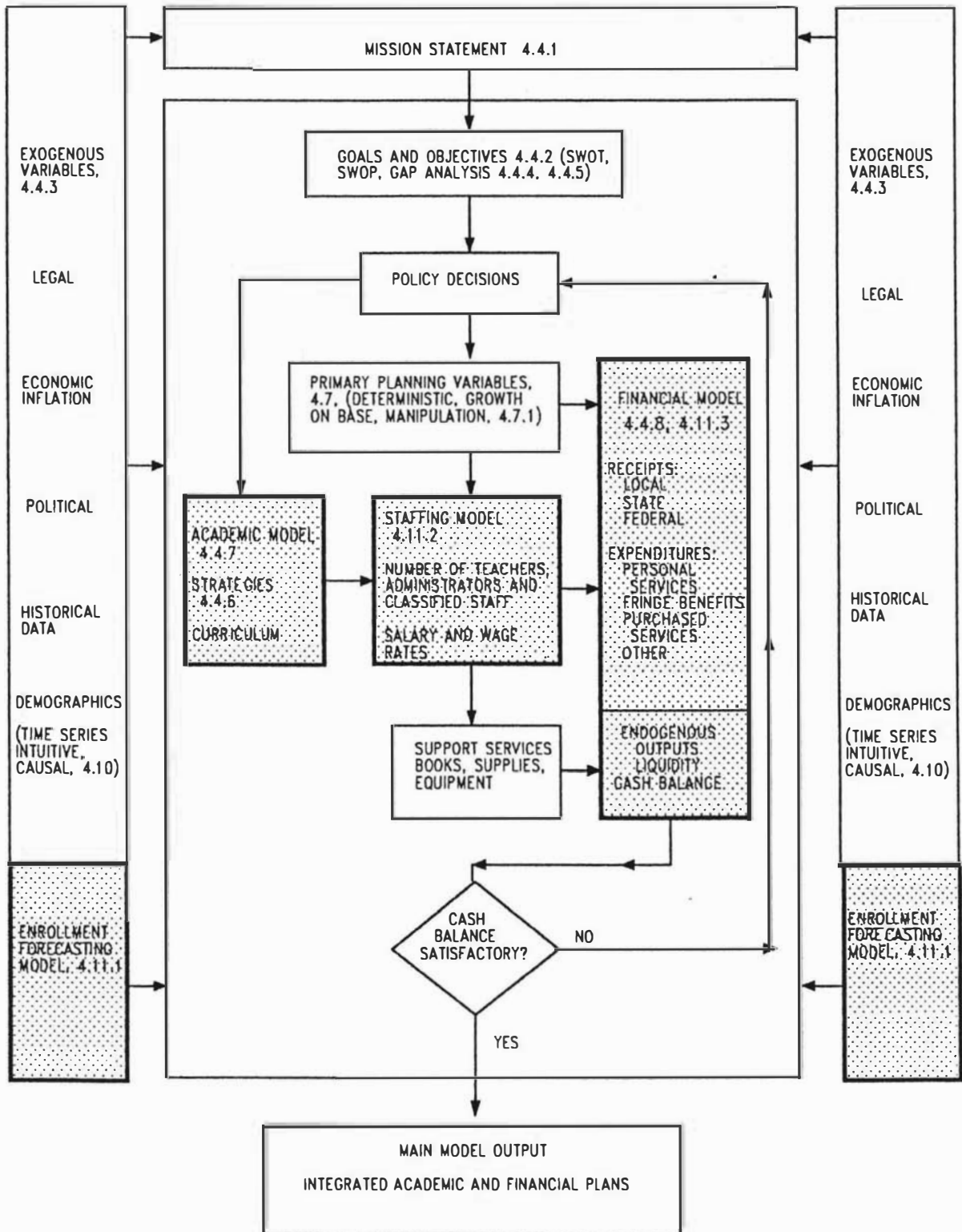
Figure 4-5 shows the relationship of these sub models to the main model. The enrollment forecasting model is separate from but integrated with the main model because it forecasts an exogenous variable on which all school district models depend. The academic planning model determines the curriculum to be offered to all of the pupils. The staffing model computes the number and cost of the teachers needed to teach the prescribed curriculum and the number and cost of other personnel needed to support the academic plan. These costs for personnel comprise 75% (Cardinale, 1981, p. 157), 84% (Glose, 1977, p. 124) or more of the total expenditures of school districts. The financial plan compares the total estimated revenues with total expenditures and determines the cash balance at year end.

The inputs and outputs of the academic planning model have been described in section 4.4.7 and will not be repeated here. Inputs and outputs of the other three models are discussed below.

4.11.1 ENROLLMENT FORECASTING SUB MODEL

Total enrollment is sufficient for financial planning for the second year of the plan and beyond; however, staffing in the initial year (budget year) of the financial plan depends a great deal on the number of pupils in each class. For this reason, the cohort method of enrollment forecasting will be used in the

FIGURE 4-5
RELATIONSHIP OF SUB MODELS WITH INTEGRATED MODEL



enrollment forecasting sub model. Figure 4-6 shows an example of the output of a cohort model to forecast enrollments. The model is based on Glose's (1977, pp. 210-213) worksheets for enrollment forecasts using the cohort method. Input and output formats for a complete cohort model are shown in Figure 6-4.

For determining survival rates for first grade for three years into the future, inputs of (1) live birth rates in the district for the previous nine years and (2) first grade enrollments for the current and past four years are required. Outputs are the survival rates to be used for the first grade forecast. These rates are established by dividing the first grade enrollment figures for any given year by the resident live births six years previously. After examining the trend of the ratios, a decision is made to use the most appropriate ratio. This ratio could be an average or weighted average of the four ratios, or it could be any ratio the decision makers believe to be the most predictive. Since the most recent information is usually most relevant, the decision could be to give more weight to the most recent ratio.

For the other grades to be forecasted, inputs are the enrollments in each grade for the current and prior three years. Based on this information, outputs are survival rates for three years for each cohort. The most appropriate survival rate to use for forecasting should be decided as above. It could be the most recent rate, an average of the three, a weighted average, or another ratio.

Forecasts of future enrollments for each grade are based on the current year's enrollments in the previous grades and survival rates. For example, fifth grade enrollment next year will be the product of this year's fourth grade enrollment multiplied by the fourth grade survival rate as determined above. All of the historical data needed for this model should be available in school district records.

FIGURE 4-6

INPUTS		COHORT SURVIVAL METHOD			OUTPUTS		
BIRTHS Year Prior	No. of resident births	1ST GRADE ENROLLMENT! School Year	on Oct. 1 !	RATIOS 1st grade to births	FORECASTED 1ST GRADE RATIO		
9th 19--	100	3rd year prior			1st year 19__-19__	147	
8th 19--	112	19__-19__	125	1.25	2nd year 19__-19__	153	
7th 19--	120	2nd year prior			3rd year 19__-19__	146	
6th 19--	130	19__-19__	127	1.13	4th year 19__-19__	146	
5th 19--	130	1st year prior			5th year 19__-19__	142	
4th 19--	135	19__-19__	130	1.08			
3rd 19--	129	current year					
2nd 19--	125	19__-19__	140	1.08			
1st 19--	127	AVERAGE RATIO		1.14			

OTHER GRADES	HISTORICAL INPUTS			RATIO	FORECASTED ENROLLMENTS		
	YR-3	YR-2	YR-1		YR+1	YR +2	YR+3
KINDERGARTEN					(Kindergarten forecasts normatively derived. 1st grade forecasts above)		
Grade 1							
Grade 2							
Grade 3							
Grade 4							
Grade 5							
Grade 6							
Grade 7							
Grade 8							
Grade 9							
Grade 10							
Grade 11							
Grade 12							
TOTAL							

4.11.2 STAFFING SUB MODEL

The number of teachers required in any given year could be simply stated as a function of enrollment for that year and a normatively derived teacher/pupil ratio (which will be a PPV) as follows:

$$\frac{\text{Enrollment}}{\text{Number of pupils per teacher}} = \text{Number of teachers required}$$

(Adapted from Pratt, 1985, p. 158).

There are, of course, other factors to consider such as grade and class enrollments in each school, curriculum offerings, teachers' certifications (subjects or grades teachers are certified to teach), special programs, and teachers' seniority. While all of these are vitally important matters to consider when budgeting the first year of the financial plan, the teacher/pupil ratio method of projecting the number of teachers to add or deduct could be used for future years and to compare with historical ratios for the purposes of "broad brush" financial planning.

Inputs to a staffing model include current teachers on continuing contracts and teachers who are expected to be re-employed for another year. Other inputs are the outputs of the enrollment model above and an acceptable pupil/teacher ratio. All changes in curriculum which increase or decrease the number of teachers needed in future years are also inputs to the model. After the first year, the number of teachers to be added or subtracted based on enrollments should be based on the formula shown above (increased enrollments and the pupil/teacher ratio). Figure 4-7 shows a staffing model with these inputs and outputs.

Personnel costs for forecasting purposes are determined by the current cost of employees plus or minus any anticipated changes in number of persons hired or dismissed as the result of enrollment or curriculum changes. Also included are increases in base rates which occur annually as employees receive an increment for additional experience. Teachers added to the number currently employed should be entered at the average salary for the district the year they are to be employed. The number of classified personnel could be based on historical data, normatively derived acceptable levels, and new or expanded services.

FIGURE 4-7
STAFFING MODEL

INPUTS	ANALYSIS	OUTPUTS
List of teachers currently employed	Teachers employed	Current teachers' salaries
Teachers salary schedule	X Salary schedule	
<hr/>		
Enrollment		
Teacher/pupil ratio	Increase/decrease in number of certified personnel	Added teachers' salaries
Programs requiring more or fewer teachers	X Average salary	
<hr/>		
Administrators and administrators' salaries	Increase/decrease	Administration salaries
<hr/>		
Substitute teachers current cost	Increase/decrease	Substitute cost
<hr/>		
Special programs (e.g. summer school) costs	Increase/decrease	Other costs
<hr/>		
		Total certificated salaries
Classified personnel (Non-teaching)	Classified employees	Classified salaries (Including step increases)
Increase/decrease in employees	X Salaries or wage rates and hours	
Wage rates and salary schedule		
<hr/>		
		TOTAL personnel services cost

Salaries for teachers in the State of Ohio for example are based, like those in many other states, on a single salary schedule. That is, teachers are paid depending on their years of education and experience rather than on merit. Each year teachers move up one step on the schedule and receive an increment. Another addition to a teacher's salary may be made when additional education is completed. Contracts with classified personnel often contain similar yearly increments for experience. These increments will increase total personnel costs each year regardless of whether or not a general pay increase on the base is negotiated. Districts can use historical data to determine the yearly cost of increments and build this into projected personnel costs. Other items which may be built into salary projections are estimates of the annual cost of graduate studies completed by teachers and longevity increments. If all of this information is included in salary and wage projections as a percentage of the previous year's cost, the forecast will include total personnel costs before any general salary and wage increases are considered. This increment percentage will be a PPV since decision makers control these costs. With this kind of a projection, the cost of various negotiated base wage and salary increases can be separated from those which will occur without an increase on base salaries and wages. Knowing the additional cost of salary and wage increases can be helpful particularly during salary and wage negotiations (Glose, 1977, p. 125). This is the method used in the staffing model shown in Figure 4-7.

An alternative method of forecasting personnel costs includes increments, longevity, and the cost of graduate study in the percentage increase offered in negotiations. The forecasted personnel costs would then include only increases in number of persons employed. This is a simpler method but still offers flexibility to decision makers (Glose, 1977, p. 125). This method will not be used in the model described here for the reasons stated in the previous paragraph.

Riscile and Smith (cited in Glose, 1977) surveyed instructors' salaries and concluded that "the pattern of the data was such that simple regression analysis is a viable and reliable method to forecast instructor salaries" (Glose, 1977, p. 124). Simple regression assumes that there is a direct relationship between two sets of variables (salaries and years) and that if plotted on a graph, an approximately straight line will result. This method of forecasting

requires considerable data, but total personnel costs for districts are easy to obtain. Glose (1977) gives a detailed explanation of simple regression which he recommends for forecasting aggregated groups of personnel (pp. 214-217). He demonstrated that the coefficient of correlation can be used to add validity to the regression analysis process (pp. 216-217). If a percentage increase is required for any year of the projection, Glose (1977) suggests working backwards from a long range forecast to calculate the percentage (pp. 124-125). This method might be used by school districts to forecast very long range (beyond five years) total personnel costs. These could then be compared with total receipts (forecasted in a similar manner) and the percentage of personnel costs to receipts examined. This analysis is similar to the ratio analysis used by Lee (1982) for all Ohio school districts and found to be highly predictive of school district fiscal health. For fewer than five years this method may be too general for planning purposes. Furthermore, it does not recognise the decision maker's ability to manipulate the number of teachers employed, salary increases, and other PPVs.

For the financial planning model being developed here the method shown earlier in this section which forecasts salaries and wages of current personnel with increments, longevity, and graduate credits will be used. This method is included in the model because it affords decision makers the flexibility to look at alternative general salary and wage increases in terms of percentages and to determine their effect on total finances.

Staffing Model - Level of Aggregation

It is not clear from the literature what advantages accrue from forecasting certificated (personnel holding teaching certificates) personnel costs by individual employee (Cardinale, 1981) or aggregating costs by elementary, middle, and high school (Glose, 1977) and forecasting by averages within each grouping. Personnel information might also be aggregated by function or object code or both (see the State of Ohio uniform accounting code in Chapter 2). In the integrated model total personnel costs (object code) will be used to focus attention on the overall financial needs of the districts rather than on smaller groups of personnel. The forecasting of personnel costs by pupil/teacher ratio or enrollment will be explored empirically and reported in Chapter 6.

4.11.3 FINANCIAL PLANNING SUB MODEL

Inputs to a financial planning model have been discussed in detail in this chapter. However, the format of the model has not been addressed. As stated above, it is unclear at this time whether personnel expenditures should be aggregated by function or by object codes or both. Because the cash flow reports (form SM1) in the State of Ohio, for example, aggregate expenditures by object code, historical data by these categories are readily available in all Ohio school districts. Categories of expenditure may differ slightly, but the expenditures themselves will be similar in other school districts. The tentative format shown in Figure 4-8 uses object codes. Receipts are aggregated in a similar manner.

Historical data are input to the model for trend analysis and as a basis for percentage increases. Exogenous variables and primary planning variables are entered by decision makers for each forecast year as percentages on the base, ratios, or normatively determined amounts. Outputs of the sub models for enrollment forecasts and staff planning are also inputs into the financial planning sub model.

Receipts

Property tax receipts are a function of assessed valuation of property and tax rates within each school district. However, state legislation designed to protect property owners from large tax increases as the value of their property rose during years of double digit inflation has resulted in complex credits and tax rollbacks. The determination of the amount of property tax to be collected in each district is determined by state and county auditors and the information is communicated to school district treasurers (Christman, 1982, pp. 4-5, 8-11). Since these variables cannot be forecasted using causal methods they should be determined intuitively as exogenous variables. Possible increases in tax receipts based on passage of a levy are PPVs and are entered in the fiscal year they are to be collected. These are entered as dollar amounts since the tax rates which will bring in the requested dollar amount will be determined by the county auditor (Christman, 1982, p. 14) based on the assessed valuation for the first year of collection. Earnings on investments ratios are PPVs since they depend on borrowing and investment policies (Smith, 1985, p. 86). However, ratios from prior years are calculated based on the ratio of earnings to total revenues as a guide for decision makers. It is recommended that these

ratios be increased if money is borrowed since this would increase cash balances throughout the year. Other local receipts (e.g., tuition, rents, fees) are also PPVs determined by decision makers as an increase or decrease on the prior year's base. It is recommended that state receipts be based on the current year's estimated receipts and any additional information derived from state sources (Christman, 1982, p. 8). Federal receipts and expenditures are not included in the model because they are categorical funds which are received and spent for specific projects, and the school district has little or no control over either receipt or expenditure of them (Campbell, et al., 1975, p. 43).

Expenditures

Personnel services costs are forecasted by the methods described in the staffing model and input to the financial model from the staffing model. Fringe benefits are forecasted as a percentage of personnel services costs because the total number of personnel employed and total salaries and wages paid determine the cost of retirement benefits and other fringe benefits. In the State of Ohio, for example, retirement costs to school districts as employers are a percentage of total salaries and wages. In other words, the percentage paid to state retirement funds is the same for all employees. In states where different rates are paid for different positions in the district, benefits can be forecasted as a percentage of salaries and wages of different categories of employees (Glose, 1977, pp. 131-134). Other fringe benefits such as hospitalization, workers' compensation, unemployment compensation, and sick leave can be forecasted as a percentage of total salaries and wages based on historical data. However, since some of these benefits can be changed by decision makers the percentage is a PPV.

Purchased services, supplies, materials, and capital goods can be forecasted using the historical rate of change and/or the rate of inflation (Glose, 1977, p. 159). However, these items have been identified as PPVs, since decision makers may increase or decrease these amounts. Capital outlay for the purchase or replacement of buses is from the general fund. Part, and sometimes all, of the cost of buses is paid for by the state. This percentage varies depending on how the buses are used (e.g., public or private school transportation, special or handicapped pupils) and whether the district purchases equipment in excess of state minimum standards. Since buses are

expensive and the cost can be large one year and non-existent another, decision makers should input this data directly when relevant (Glose, 1977, pp. 160,161). If all or most of the cost of buses is paid by the state, the decision may be made by the district to include neither receipts nor expenditures which cancel each other and hence do not affect financial planning.

Borrowing and repayment of short term notes or loans are not included in receipts or expenditures so that comparisons of totals between years are not distorted. Interest on all loans and notes is included.

The endogenous outputs of the financial planning sub model are cash balances, the difference between total revenues (beginning cash balance plus receipts) and total expenditures each year. The ending cash balance each year is, of course, input into the following year. The main model is iterative. Policy decisions which affect PPVs can be changed as often as desired until the year end cash balances are satisfactory to decision makers. In other words, the model can be operated using a pupil/teacher ratio of 20 pupils per teacher. If the cash balance during the final year of the financial plan is a deficit, decision makers can change the ratio to 22 pupils per teacher to see what the effect of that decision would be on the cash balances. For example, a deficit in one of the early years of the model, but a satisfactory balance after three years, might lead to a policy decision to change the year in which equipment is purchased instead of obtaining a short term loan.

The output format of the financial planning sub model shows forecasted financial plans for three years which will keep the district solvent while supporting the curriculum in the academic plan. The model can easily be extended further into the future.

4.12 SUMMARY

This chapter has briefly described budgeting and early planning-budgeting systems in United States school districts. Relevant research about school district financial models is scarce and approaches school district financial planning from several different perspectives. Glose (1977) designed a

financial forecasting system to help school districts plan their finances. Cardinale (1981) recognized decision makers' need for greater access to information and developed a personnel management information system. Lee (1982) and Smith (1985) identified the indicators of school district fiscal health in the State of Ohio. Cibulka (1987) studied ten urban school systems and cited the lack of long range financial planning as one reason for their poor performance.

The literature discussed in Chapters 2 and 3 as well as other relevant research examined in this chapter form the basis for the literature-based integrated planning and financial planning model for school districts which is presented here (Figure 4-1). Primary planning variables and exogenous variables are listed and means of varying the PPVs and forecasting the exogenous variables are discussed.

Sub models for enrollment forecasting, academic planning, staffing, and financial planning as well as inputs and outputs of sub models are described.

4.13 CONCLUSIONS

The literature survey has identified few areas where information is available regarding financial planning or computerized financial planning models in school districts in the United States. No empirical studies have been discovered which indicate whether or not a significant number of school districts are using financial models, although current literature (Cardinale, 1981; Cibulka, 1987; Jordan & Webb, 1986) suggests that little progress has been made during the past ten years in financial planning for school districts.

The theoretical model in this chapter is normatively derived, based on those elements which the literature suggests should be included in a financial planning model. They are as follows:

PPVs PRIMARY PLANNING VARIABLES	EXOGENOUS VARIABLES
-----	-----
No. of teachers	Demographics - enrollments
No. of administrators and other support personnel	Local real tax receipts
Teacher/pupil ratios	Personal property tax receipts
Salaries and wage rates	State foundation receipts
Projected salary and wage rate increases	State receipts - other
Increments and graduate credits	State reimbursement (for tax credits)
Fringe benefits	Other local receipts(increase or decrease)
Purchased services	
Materials, supplies, equipment	
Investment earnings	
Capital purchases	
Other expenditures	
New tax levies	

The main model contains sub models for enrollments, academic plan, staffing, and financial planning. The enrollment sub model (enrollments are an exogenous variable) is outside the main model but integrated with it. The other sub models are all affected by the PPVs which reflect policy decisions. The outputs of the enrollment, academic plan, and staffing sub models are input into the financial planning model.

The financial planning model compares total revenues (beginning cash balance plus total receipts) with total expenditures to determine the cash balances (endogenous outputs) at year end. If the cash balances are satisfactory to decision makers, the outputs of the main model are academic plans and financial plans which are integrated. In other words, the academic programs determined by the policy decisions are financially operational for the term of the integrated financial plan. If the cash balances are not satisfactory, the PPVs can be varied until decision makers are satisfied with the cash balances.

Empirical work will seek to answer questions about school district financial planning which are not addressed in the literature and which may modify the model design.

The work will be undertaken to discover (1) if and how long range planning and financial planning models are currently being used in school districts, (2) whether or not school district decision makers would consider financial modeling helpful for decision making, (3) the decisions for which financial models are deemed most helpful currently, (4) which school district staff are modeling or operating financial models developed by others, (5) what obstacles deter school districts from adopting computerized financial models, and (6) how and at what level of aggregation current models are designed and operated.

To discover the extent of long range financial planning and modeling in school districts and the need, if any, for financial planning models, answers will be sought for these questions:

1. Do school districts have long range financial plans? If not, do they want them?
2. Do school districts use financial planning models? If not, would they consider using models specifically developed to meet their needs?
3. If districts have financial plans, do annual budgets agree with the first year of their financial plan?
4. Have districts with financial plans ever used computers or computer financial models? Would they consider using them? If not, what are the obstacles?
5. Who takes part in the budgeting and/or financial planning?

To discover how computerized financial planning models currently in school districts are designed, who operates them, and how they are used, answers to the following questions will be sought from treasurers of those districts.

1. Who instigated, developed, operates your models?
2. How do you use your financial models? For long range financial planning? Enrollment planning? Staffing planning? Capital projects? Salary and wage negotiations?
3. How do you vary your primary planning variables? Deterministic? Percentages? Ratios to other variables? Statistical forecasting?
4. If you use statistical forecasting, what techniques do you use? Historical trend? Causal?

5. How do you deal with uncertainty? Stochastic methods? Sensitivity analysis of variables? "What if" scenarios?
6. How do you forecast enrollments? Cohort? Class progression? Other?
7. How do you forecast staffing? Pupil/teacher ratios? Enrollments? Other?
8. Do you run your models on a mainframe? Mini? Micro?
9. Do your administrators object to using keyboards?
10. Do any of your administrators design their own models? Why?
11. Are administrators concerned about the influence of data processing personnel when computers are used for financial planning?
12. At what level do you aggregate numbers for financial planning? Budgeting?

Chapters 5 and 6 analyze the author's empirical research in the State of Ohio designed to answer these questions. The literature-based integrated financial planning model for school districts presented in this chapter is then refined depending on the results of that research.

REFERENCES

CHAPTER 4

- Brandt, J.M. (1986). Ohio school financial handbook (rev.) based on R.G. Stabile & P.E. Spayde, *What every Ohio citizen should know about school finance*. Westerville, OH: Ohio School Boards Association.
- Brazaitis, T.J. (1988, February 26). Bennett says schools lacking. *The Plain Dealer*, 13-A.
- Budget Document*. (1988). Unpublished 1988-1989 budget. OR: Beaverton School District No. 48J.
- Campbell, R.F., Cunningham, L.L., Nystrand, R.O., & Usdan, M.D. (Eds.). (1975). *The organization and control of American schools*, (3rd ed.). Columbus, OH: Charles E. Merrill.
- Cardinale, O. (1981). On a generic management information system model with applications to public school systems. *Dissertation Abstracts International*, (University Microfilms No. AAD82-03949).
- Christman, L.H. (1982). *Streamlining local school budgeting in Ohio*. Cleveland OH: Citizens Council for Ohio Schools. (ERIC Document Reproduction Service No. Ed233 457).
- Cibulka, J.G. (1987). Theories of educational budgeting: Lessons learned from the management of decline. *Educational Administration Quarterly*, 23(1), 7-40.
- Clark, D.L. (1981). In consideration of goal-free planning systems in education. *Educational Administration Quarterly*, 17(3), 42-60.
- Cohen, M.C. (1983). Tax capacity, tax effort, and state funding of schools in Ohio. *Journal of Educational Finance*, 9(2), 141-156.

(References continued - Chapter 4)

Cohn, E., & Millman, S.D. (1975). *Input-output analysis in public education*. Cambridge, MA: Ballinger.

Costs per pupil. (1986). Columbus, OH: Department of Education, Division of Computer Services and Statistical Reports.

Davis, O.A., Dempster, M.A.H., & Wildavsky, A. (1966). A theory of the budgetary process. *The American Political Science Review*, XL(3), 529-547.

Five year plan 1987 - 1992. (1987). Unpublished document. North Royalton, OH: North Royalton City Schools.

Gist, J.R. (1976). "Stability" and "competition" in budgetary theory. *American Political Science Review* 76, 859-872.

Glose, G.P. (1977). A long range financial planning/forecasting model for local school districts. *Dissertation Abstracts International*, (University Microfilms No. AAD78-14000).

Hopkins, D.S.P. & Massy W.F. (1981). *Planning models for colleges and universities*. Stanford, CA: Stanford University Press.

Iannaccone, L. & Lutz, F.W. (1970). *Politics, power and policy: The governing of local school districts*. Columbus, OH: Charles E. Merrill.

Jordan, K.G. & Webb, L.D. (1986). School business administration. *Educational Administration Quarterly*, 22(3), 171-199.

Kami, M.J. (1979). *Managing the future*. Lighthouse Point, FL: Corporate Planning.

Lee, R. (1982). *Financial and staffing ratio analysis: Predicting fiscal distress in school districts*. Unpublished doctoral dissertation, Ohio State University.

(References continued - Chapter 4)

- Lewis, J., Jr. (1983). *Long-range and short-range planning for educational administrators*. MA: Allyn and Bacon.
- Martin, D.B. (1987). *Long range planning for school districts*. Westerville, OH: Ohio School Boards Association.
- National Education Association. (1984). *Estimates of school statistics, 1983-84 as provided by the state departments of education*. Washington, D.C.: Author, Research Division.
- Pratt, M.J. (1985). *Computerized support for financial planning in South African universities*. Unpublished doctoral dissertation, University of South Africa.
- Smith, K. (1985). *Forecasting school district fiscal health*. Unpublished doctoral dissertation, Ohio State University.
- Smith, K. (1986). Forecasting school district fiscal health. Dissertation research. *Journal of Education Finance*, 12, (1), 140-153.
- Van Dusseldorp, R.A. , Richardson, D.E., Foley, W.J. (1971). *Educational decision-making through operations research*. Boston, MA: Allyn and Bacon.
- Wacht, R.F. (1984). *Financial management in nonprofit organizations*. Atlanta, GA: Georgia State University.
- Whetten, D.A. (1981). Organizational responses to scarcity: Exploring the obstacles to innovative approaches to retrenchment in education. *Education Administration Quarterly*, 17(3), 80-97.

CHAPTER 5

HYPOTHESES AND ANALYSIS OF RELEVANT EMPIRICAL RESEARCH

5.0 INTRODUCTION

Literature pertaining to the special problems of school district financing and use of resources was described in Chapter 2. A theoretical base for financial planning for school districts was developed in Chapter 3 from the literature relating to planning, financial planning, and financial modeling for business, tertiary education, and school districts. The elements of school district financial planning were explored in Chapter 4, and an integrated financial planning model based on the literature was developed.

Specific hypotheses derived from the literature search are listed in Chapter 5. Questions are formulated to prove or disprove the hypotheses and to discover if there is a need for this study. Objectives of this research as stated in Chapter 1 also relate to some of the questions and are repeated below.

A description is given of the empirical research undertaken to prove or disprove the hypotheses and to further the objectives of the research. The results of responses to the questionnaire and other empirical work are analyzed in detail and conclusions are drawn. Other responses to the questionnaire, those pertaining to the structure and use of financial models currently being operated in school districts, will be analyzed in Chapter 6. This information will then be used to refine the literature-based financial planning model for school districts described in Chapter 4.

This chapter is composed of the following sections:

- 5.0 Introduction
- 5.1 Objectives and Hypotheses
- 5.2 Structure of Empirical Research
- 5.3 Interviews
- 5.4 Questionnaire

- 5.5 Other Empirical Research
- 5.6 Analysis of Questionnaire Responses by Hypotheses
- 5.7 Analysis of Questionnaire Responses by Objectives
- 5.8 Summary
- 5.9 Conclusions

5.1 OBJECTIVES AND HYPOTHESES

Chapter 1 listed the objectives of this research as follows:

1. determine if a significant number of school districts in the United States use computerized financial planning,
2. identify the factors which inhibit or advance the use of computerized long range financial plans,
3. adapt or develop a computerized financial planning model to assist school decision makers with long range financial planning.

The following conclusions were reached from the literature survey discussed in Chapters 2, 3, and 4. They form a basis for the hypotheses listed on page 156.

1. School district decision makers can benefit from financial planning (Glose, 1977, pp. 242-244; Smith, 1985, p. 11).
2. Few school districts engage in multi-year financial planning (Cibulka, 1987, p. 15).
3. Research in school district financial planning is mainly in the area of state and federal funding (Adams, 1980, p. 4-6; La Morte & Williams, 1985; Matthews & Holmes, 1984).
4. The most important decisions which affect school districts' "fiscal health" are made by local school decision makers (Smith, 1985, p. 143).

Hence, the following hypotheses have been developed from the above conclusions. If significant support is found for the hypotheses, the development of a computerized financial planning model for school districts should prove to be a worthwhile research project.

1. Most school districts in the United States recognize the need for financial planning (Glose, 1977, p. 77).
2. Few school districts use computerized financial plans (Cardinale, 1981; Cibulka, 1987; Grafton & Permaloff, 1985).
3. The most important barriers to school district use of computerized financial plans are lack of money and expertise (Cibulka, 1987; Glose, 1977).
4. Most school districts which do not use computerized financial plans would consider using financial planning models if they were designed specifically for school districts. (Glose, 1977, p. 77, 242-243).

To prove or disprove these hypotheses, empirical research was conducted within school districts in the State of Ohio (see section 5.3) in the United States. The research is both descriptive and normative. The questions and hypotheses are related to (1) perceived need for financial planning, (2) interest in computerized financial planning models, and (3) a description of how computerized financial models are being operated currently.

The empirical research also seeks to answer the questions asked at the conclusion of Chapter 4, the answers to which were not found in extant literature. In this chapter replies to the first set of those questions will be addressed. These questions seek to discover the extent of long range financial planning and modeling in school districts and the need, if any, for financial planning models:

1. Do school districts have long range financial plans? If not, do they want them?
2. Do school districts use financial planning models? If not, would they consider using one specifically developed to meet their needs?
3. If districts have financial plans, do annual budgets agree with the first year of their financial plan?
4. Have districts with financial plans ever used computers or computer financial models? Would they consider using them? If not, what are the obstacles?

Answers to the other questions in Chapter 4 will be dealt with in Chapter 6.

5.2 STRUCTURE OF EMPIRICAL RESEARCH

Empirical research is conducted for the following reasons:

1. to prove or disprove the hypotheses drawn from the literature surveys;
2. to promote the aim of the research stated in Chapter 1, namely, to assist school board decision makers with long range financial planning;
3. to further the objectives stated in section 5.1.;
4. to obtain descriptive evidence of school district financial planning where it is occurring;
5. to seek replies to questions about school district financial planning and financial planning models which are not answered in extant literature; and
6. to discover financial planning models which are in use and might contribute to a generic model designed specifically for school districts.

Empirical work for this research includes:

1. a questionnaire to school districts to discover if and how financial planning is used;
2. letters to all fifty State School Board Associations asking about financial planning models in use in their states;
3. letters to members of School Business Officials Associations seeking additional information about financial planning models;
4. interviews with school board members, superintendents, and school business officials discussing their particular school district financial planning;
5. interviews with state officials involved with school financing to discover other financial planning models;
6. letters to and interviews with persons who have recently conducted research into various aspects of school district financing; and,
7. development and testing of a generic financial planning model.

Interviews with school district officials which relate to the content and structure of the questionnaire or the need for the research are reported first. Then empirical work analyzed in this chapter will test the hypotheses. Replies from the questionnaire which relate to the objectives will also be discussed. Questions pertaining to current financial planning which are listed at the conclusion of Chapter 4 will be addressed.

5.3 INTERVIEWS

The following interviews were held in the State of Ohio to seek information about the state of financial planning in school districts and advice about the design of the questionnaire.

OHIO SCHOOL BOARDS ASSOCIATION OFFICIALS

On January 6, 1988, the researcher met for three hours in Columbus, Ohio, with the Executive Vice President of the Ohio School Boards Association (OSBA) and his deputy. They examined the questionnaire in detail and offered many helpful suggestions for clarifying questions and increasing the number of respondents.

OHIO DEPARTMENT OF EDUCATION

At the suggestion of OSBA officials, the author met with the Director of School Finance of the Ohio Department of Education, at the Ohio Departments Building in Columbus, Ohio, on January 27, 1988, for one and a half hours. He described a programming, planning, budgeting system (see Chapter 2 for a description of PPBS) which is operating in an Ohio school district. He mentioned prior research in the State of Ohio by Lee (1982) and Smith (1985) which concerned school district finances but did not know of any school districts in Ohio which operated computerized financial planning models.

OHIO STATE AUDITOR'S OFFICE

One of the lawyers with the Management Advisory Services Department of the Ohio State Auditor's Office, met with this researcher on February 16, 1988 for more than an hour. She expressed a great deal of interest in this research since school districts in Ohio are no longer required to submit an annual

budget prior to the beginning of each fiscal year. The State Auditor's Office, while mainly concerned with auditing of school district records, would like to encourage financial planning in the hope that it will alert school districts to financial problems in time to prevent them.

SCHOOL DISTRICT OFFICIALS

The author met with an Ohio school district superintendent and his data processing manager twice during January 1988. They described how financial planning had enabled the district to recognize problems in time to avoid them. All historical data for this district are recorded on an IBM mainframe. Micros in the treasurer's office are not connected to the mainframe, so aggregated data must be re-entered on the micro for timely "what if" analysis. Lack of administrative time has been a barrier to development of a financial planning model for their micro.

The author met with another school district superintendent who has performed considerable research concerning school district fiscal health. The meeting took place on February 3, 1988, for about two hours. This superintendent recognizes the need for computerized financial planning models and is currently developing a model for his school district. He offered valuable suggestions to the author about how to proceed with this study.

Other school board members and treasurers (at meetings of the Cuyahoga County Treasurers' Association in Cleveland, Ohio) offered information and support for the project. They described their need for financial planning models and offered to evaluate models developed as a part of this research.

5.4 QUESTIONNAIRE

A five page questionnaire was developed and sent to all of the school district treasurers in the State of Ohio. The State of Ohio was chosen for the empirical research for several reasons:

1. Ohio has a population of 10.5 million people, one of the ten states which together contain half the people in the United States. It ranks seventh in total school district expenditures (National Education Association, 1984).

2. Ohio is located in the mid-western United States and has several large industrial centers as well as many farming communities. There are large and small urban, suburban, and rural school districts providing a variety of settings thus reflecting the varied nature of the United States as a whole.
3. All of the regular school districts in Ohio teach grades from kindergarten through twelfth grade and are, therefore, easily compared with each other and with school districts in other states.
4. Ohio ranks 25th in expenditures per pupil, spending close to the average per pupil for all United States school districts (National Education Association, 1984).
5. Ohio's public school finances have been the subject of several studies including those of Christman (1982), Lee (1982), Cohen (1983), and Smith (1985), some of which contribute to the background of this research.

The State of Ohio therefore is a good test venue for empirical work as it has characteristics similar to those of many other states, making the findings potentially relevant to school districts in other states.

In addition, it was assumed that the response rate would be relatively high in Ohio because of the enthusiastic cooperation of the Ohio School Boards Association (OSBA) which eased the mailing of the questionnaires by making available, at cost, labels personally addressed to the recipients. Additionally, the cover letter is written on OSBA stationary by the OSBA executive vice president. Also, the researcher, as a former school board member and school district treasurer, has many personal contacts, particularly in Ohio.

The questionnaire was pre-tested by a school district treasurer whose board and administration had just completed a long range financial plan. Her suggestions were incorporated into the questionnaire. The OSBA executive vice president and his deputy also suggested several changes to the questionnaire format. The final version of the questionnaire and cover letter are shown in Appendices A and B. Figure 5-1 is a matrix of the hypotheses and objectives compared with the questions which seek to prove or disprove them. The specific questions relating to each hypothesis and objective will be discussed in detail later in this chapter.

FIGURE 5-1

MATRIX OF HYPOTHESES AND THE QUESTIONS TO TEST THEM							
QUESTIONS	HYPOTHESIS 1. Most School Districts recognize need for FP	HYPOTHESIS 2. Few School districts use CFPs	HYPOTHESIS 3. Barriers to CFPs	HYPOTHESIS 4. Would consider specific model	OBJECTIVE 1. Same as Hypoth. 1	OBJECTIVE 2. Factors in- hibiting or advancing LRFP in School Dist.	OBJECTIVE 3. Adapt or develop generic LRFP model
1. Do you have plan?	X				X		
If not, need one?	X						

1. Length of plan							

3. Who does FP/Budgets?			X			X	X

5.&6. Only if no Comp FP		X					

8-20. Only if Comp FP How designed & used.		X					X

5.&6. a. Tried but quit			X			X	

b. Not practical			X			X	

c. Too complicated			X			X	

d. Data Processors control			X			X	

e. Don't like keybds			X			X	

f. Decisions are political			X			X	

g. No time to learn			X			X	

h. Too expensive			X			X	

6. Other reasons			X			X	

7. Would consider CFP model for School Districts in your State				X		X	

8-20. Currently use computer models How models are designed and used in School Districts		X					X

FP=Financial Plan

LRFP=Long Range FP

CFP=Computerized FP

Following the advice of OSBA officials, school district treasurers (instead of superintendents or school board presidents) were chosen to answer the questions. Ohio School Boards Association experience with surveys indicated that school board presidents are often not well informed about the day to day financial administration of their districts. It was thought that superintendents might answer financial questionnaires but were more likely to give them to their treasurers to complete. For these reasons, questionnaires were sent directly to treasurers, the officials most likely to be interested in the project and have the information requested at hand.

Questionnaires were sent to all 616 school district treasurers in the State of Ohio. All Ohio city, local and exempted village districts were included. The special education, county, and joint vocational education districts were excluded. These special districts were established to support regular districts, and their total spending is less than 4% of current expenses for all school districts in the state (Costs Per Pupil, 1986). The questionnaires were mailed in the United States. The suggested return date was approximately one month after they were received. Return envelopes were addressed to the author at the OSBA address in Columbus, Ohio.

One week after the questionnaires were to be returned, a post card was sent to all district treasurers thanking them for answering the questions. It contained once again the address of OSBA and served as a reminder for those who had not yet responded. A copy of the post card is shown in Appendix C.

Two hundred and sixty-six questionnaires were answered, and one was returned blank with the treasurer stating he was too new in the position to offer any comments. This represents a return of 43.3%. The response is of a sufficient size to provide descriptive evidence of financial planning in school districts in Ohio. Two hundred and fifty-four (95.5%) respondent school districts identified the county in which they were located. Of these 254 returns at least one was received from 66 (75%) of the 88 counties in Ohio, suggesting a representative geographical distribution. Included were returns from large, urban city districts (more than 50,000 pupils), large and small suburban districts, and large and small rural districts (fewer than 100 pupils). When all 616 districts are ranked by size (Costs Per Pupil, 1986) in descending order

according to average daily membership (ADM) and converted into deciles (61.6 school districts per decile), it is observed that between 20 and 33 responses (from the 254 school districts which could be identified) were received from each decile as shown in Figure 5-2. Had the distribution been equal in each decile, the number of respondents in each decile would be 25.4. This suggests that responses show little bias in favor of either large or small districts and are usable for descriptive purposes.

Most of the questionnaires were returned by the date requested. Only 15 were returned after the reminder was sent. As may be expected, not all questions were answered on every questionnaire.

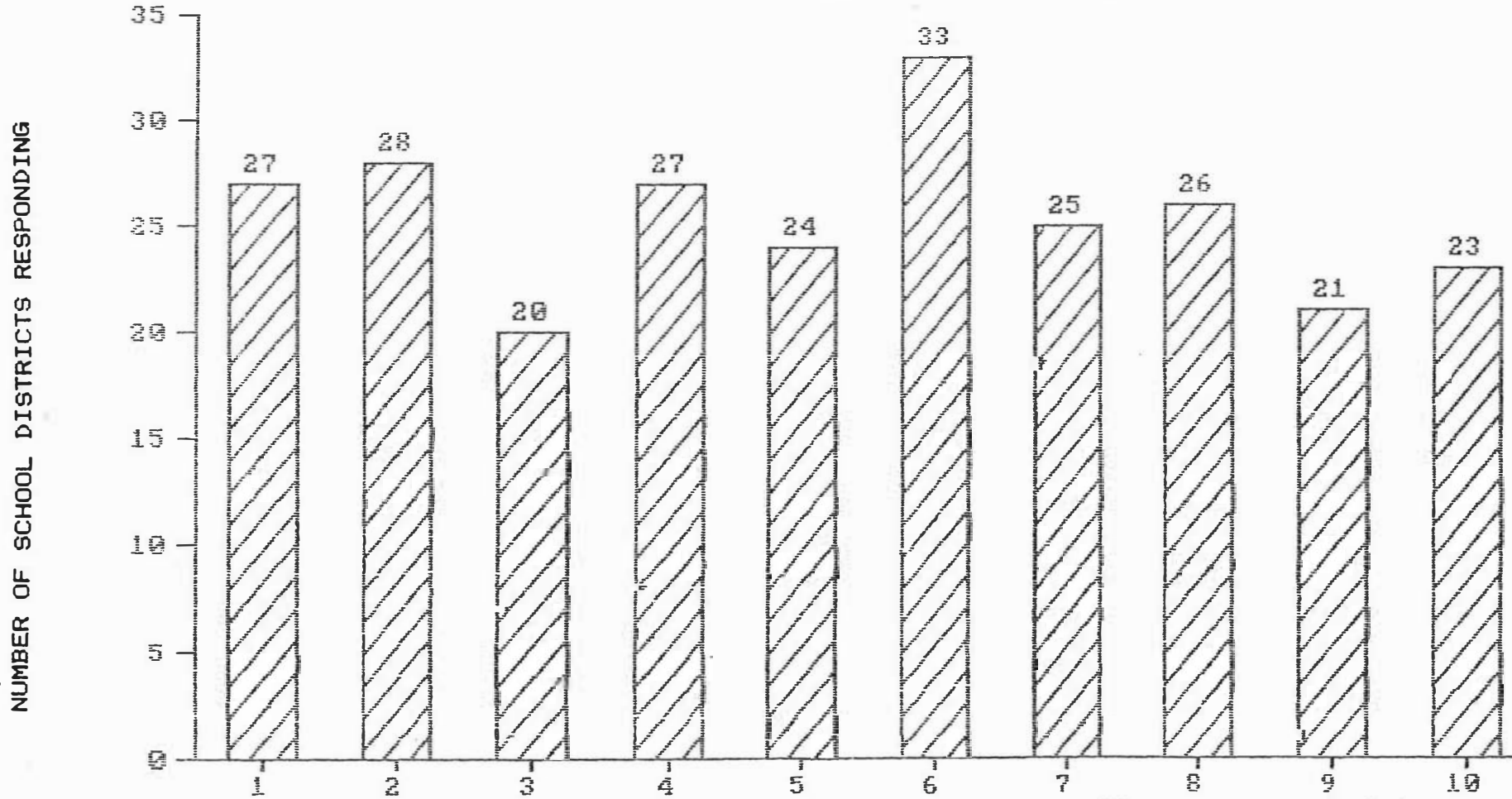
5.5 OTHER EMPIRICAL RESEARCH

Letters were sent to Associations of School Boards in all states except Ohio and Hawaii, a total of 48 in all, asking them to provide the name of any school district within their state which used financial planning models. Hawaii is not divided into school districts, so no information was expected from that state. A sample of the letter is contained in Appendix D.

Replies were received from nine states, a return of only 18.75%. However, all of the replies showed a great deal of interest in the project. Several associations asked to be kept informed of progress in development of a generic model. The letters contained names, addresses and telephone numbers of interested persons. The researcher contacted all of these people by telephone or by mail.

In addition to the OSBA officials mentioned above, interviews were held with superintendents, treasurers, and other school district personnel who have a particular interest in financial planning. Two school districts which conduct financial planning were visited. Officials in the Ohio Department of Education and the Ohio State Auditor's Office were interviewed about their interest in financial planning. They offered valuable information not available in the literature. Details of some of these contacts are delineated in section 5.7.

FIGURE 5-2
RESPONDING SCHOOL DISTRICTS BY SIZE



DECILES (ONE TENTH OF THE TOTAL DISTRICTS) OF 61.6 DISTRICTS
DETERMINED BY AVERAGE DAILY MEMBERSHIP (ADM)

FIGURE 5-2

5.6 ANALYSIS OF QUESTIONNAIRE RESPONSES BY HYPOTHESES

A matrix of answers to questions related to the hypotheses is shown in Appendix E. The answers are discussed in detail in this section.

HYPOTHESIS 1 Most school districts in the United States recognize the need for financial planning.

In reply to question 1 asking if their school district has a long range financial plan (long range was defined as any plan beyond the following year's budget), 143 districts (54.2%) indicated that they have such a plan. If the answer to the question was negative, treasurers were asked if they thought their district needed a long range financial plan. One hundred and three treasurers (39%) thought their district needed a financial plan. Treasurers in only 18 districts (6.8%) thought their districts did not need a financial plan. See Figure 5-3.

FIGURE 5-3

SCHOOL DISTRICTS WITH FINANCIAL PLANS

	Number	Percent
Have a financial plan	143	54.2
No plan, but need one	103	39.0
No plan, don't need one	18	6.8
	-----	-----
Total replies (to Q. 1)	264	100.0

This high percentage of districts who have financial plans is surprising. Current literature suggests that financial planning is relatively new in school districts and that few districts undertake multi-year financial planning (Cibulka, 1987; Martin, 1987).

Of the 121 districts who do not have a financial plan, 103 (85%) of the treasurers indicate they think their district needs one. Only 18 (15%) treasurers indicate their district has no need for financial planning. This agrees with the finding of Glose (1977) who found that most school officials recognize the importance of financial planning although they may not translate that recognition into action (p. 77).

Of the treasurers who indicate their districts do not need financial plans, one notes that they do have unwritten long range goals. Another says that their district is small, rural, and agricultural so that most forecasting can be handled with their current methods. (They use both manual calculations and computer spreadsheets for employee salary and wage negotiations.) One treasurer mentions the difficulty of estimating resources from the state. Another district is temporarily closed because of small enrollment and sends its students to another district.

It is interesting to compare the size of school districts which conduct financial planning with those which do not. Below is a comparison of size of school districts which answered the questionnaire about financial planning.

FIGURE 5-4

COMPARISON OF SIZE OF DISTRICTS
Determined by Average Daily Membership (ADM) or Enrollment

Districts	ADM Max	ADM Min	ADM Ave	Standard Deviation
WITH FINANCIAL PLANS				
not computerized	65,557	710	3,584	7,651
mainframe or mini	16,000	587	3,251	3,657
micro	12,494	131	3,997	3,042

WITHOUT FINANCIAL PLANS				
but need one	7,679	431	2,141	1,698
but use computer models	3,009	1,213	2,248	758

and don't want one	3,221	73	1,364	813

While the evidence is not conclusive, it appears from an examination of the average daily memberships (ADMs) that larger school districts are more likely to conduct financial planning than smaller districts.

Annual budgets should be based on the first year of a financial plan. To find out if this is the practice in school districts, those which have financial plans were asked if their annual budgets are based on the first year of their financial plans. One hundred and thirty-one (91.6%) of the districts with financial plans (143) answered this question. Of those who responded, 124 (94.7%) replied affirmatively. Only seven districts (5.3%) do not coordinate their annual budget

with their financial plan. It is interesting to note that five of the seven districts not coordinating their budget with their financial plan are not computerized. The other two districts conduct their financial planning on micros. Since no further questions were asked in this area, no conclusions can be drawn about the lack of coordination between financial planning and budgeting in these seven districts. However, most districts with financial plans do base their annual budgets on the first year of the plans.

CONCLUSION - There is much support for hypothesis 1 with 93.2% of respondents stating that their district already has a financial plan or needs one. It is reasonable to expect, for reasons discussed in section 5.3, that replies to this questionnaire would be much the same throughout the United States. Although questionnaires were sent only to Ohio treasurers, Chapter 2 demonstrates that all public school districts in the nation have similar kinds of resources and expenditures, are expected to educate all of the pupils living within their boundaries, and provide similar kinds of schools from first through twelfth grades.

Of the 264 school district treasurers who answered this question, 246 (93.2%) either have a financial plan or think their district needs one. They recognize that an annual budget alone is not enough. This conclusion agrees with prior research (Cardinale, 1981; Glose, 1977; Martin, 1987) which suggests that school districts recognize that financial planning is a valuable tool.

HYPOTHESIS 2 Few school districts use computerized financial plans.

Questions 8 through 20 were to be answered only if the district uses computerized financial planning. Of the 54 (20.3%) districts who answered these questions, 31.5% conduct financial planning on mainframes or minis. The majority, or 68.5%, operate micros.

Questions 5 and 6 were to be answered only if the district does not use computers to conduct financial planning. These questions were answered by 89 (33.5%) districts who have non-computerized financial plans (as well as the 121 (45.5%) districts without financial plans). Therefore, of the 143 districts which have financial plans, 54 are computerized, and 89 are not. This

demonstrates that 62.2% of districts who have financial plans do not have them computerized. See Figures 5-5 and 5-6 for details of these replies.

FIGURE 5-5

SCHOOL DISTRICTS WITH COMPUTERIZED PLANS

	Number of Replies	Percent of Replies
Computerized Plan on Mainframe or Mini	17	31.5
Computerized Plan on Micro	37	68.5
	----	-----
Total Computerized	54	100.0

FIGURE 5-6

SCHOOL DISTRICTS WITH COMPUTERIZED FINANCIAL PLANS
COMPARED TO NON COMPUTERIZED AND ALL RESPONDENTS

	Number of Replies	Percent with Plans	Percent of Total Replies
Computerized Plan on Mainframe or Mini	17	11.9	
Computerized Plan on Micro	37	25.9	
	----	-----	
<u>Sub-Totals</u> Computerized	54	37.8	20.5
Non computerized Plans	89	62.2	33.7
	----	=====	
<u>Sub-Totals</u> with Financial Plans	143	54.2	
No Financial Plans	121	45.8	45.8
	----	-----	-----
Grand Total	264	100.0	100.0

Although only a small percentage of school districts have computerized financial plans, it is interesting to note that those with computerized plans are not necessarily the largest districts answering the questionnaire. It is also interesting that the size of districts which use micros is generally smaller than that of those with mainframes and minis as shown in Figures 5-7 and 5-8.

FIGURE 5-7

SIZE OF DISTRICTS WITH FINANCIAL PLANS
Determined by Average Daily Membership (ADM)

	No. of Replies	ADM Max	ADM Min	ADM Ave	Standard Deviations
FP not computerized	89	65,557	710	3,584	7,651
Plan computerized on Mainframe or Mini	17	16,000	587	3,251	3,657
FP computerized on Micro	37	12,494	131	3,997	3,042

FIGURE 5-8

SIZE OF DISTRICTS WITHOUT FINANCIAL PLANS
(Determined by Average Daily Membership ADM)

	No. of Replies	ADM Max	ADM Min	ADM Ave	Standard Deviations
No Financial Plan, but need one	98	7,769	431	2,141	3,042
No Financial Plan, but use computer models	5	3,009	1,213	2,248	758

CONCLUSION - There is a great deal of support for hypothesis 2, that few school districts use computerized financial planning. Only 37.8% of responding Ohio school districts which have financial plans (54) have computerized them. This represents only 20.5% of all districts (264) responding to these questions. While the questionnaires were sent only to Ohio treasurers, letters from other State Associations of School Boards indicate that computerized financial planning is not practiced by a significant number of districts in other states throughout the United States.

HYPOTHESIS 3 The most important barriers to school district use of computerized financial plans are lack of money and expertise.

Question 5 lists some of the barriers to using computerized financial plans. The question was asked of all respondents who do not use computers for

financial planning. There was a potential of 210 answers for each part of the question (89 have financial plans which are not computerized and 121 do not have financial plans). Interestingly, not all parts (a through h) of question 5 were answered by every district. For example, only 98 replies were received for part a while 112 answered part b. For this reason the number of districts replying to each part of question 5 is followed by a percentage of the total number of replies to that part of the question in Figure 5-9. This figure is a matrix of all the replies to this question. The percentages should assist the reader with comparisons.

Treasurers were asked if they strongly agree or strongly disagree with eight statements, a through h. Part a states that school districts have used computer models in the past but no longer do. The answers show that 86 districts, or 87.8%, disagree with that statement. Only three districts (3%) agree that they had tried computer models but then stopped using them. The nine answers (9.2%) which neither agree nor disagree indicate uncertainty about what has happened in past years.

Part b questions the practicality of computer models. The replies point out quite clearly that although they do not use models, the majority of districts (70.5%) view computer models as practical; only 7.2% agree that they are not practical; and 22.3% are uncertain. Since this question was answered only by districts not currently using computerized financial planning models, the large percent of "uncertain" replies may indicate unfamiliarity with computer models.

Part c suggests that computer models are too complicated for decision makers. Answers show that most school administrators (78.1%) do not find computer models too complicated to understand. Only three, or 2.9%, find models too complicated, and 19% are uncertain. The fairly large percentage which are uncertain may again represent unfamiliarity with computer models.

Part d indicates that control of computer models by data processing personnel may be a deterrent to using them. Most respondents (84%) do not perceive this kind of control as a problem. The answers are contrary to the position taken by decision makers in earlier surveys when computers were relatively new (see Chapters 3 and 4). Fewer than 2% of respondents to this questionnaire strongly agree that data processing personnel might exert too much

FIGURE 5-9

	REASONS FOR NOT USING COMPUTERS FOR FINANCIAL PLANNING						Median (0-4)
	Strongly Disagree		Neither Agree nor Disagree		Strongly Agree		
	0 Number and % of Replies	1 Number and % of Replies	2 Number and % of Replies	3 Number and % of Replies	4 Number and % of Replies		
a) We tried computer models but stopped using them.	72 (73.5)	14 (14.3)	9 (9.2)	3 (3)	0	0	
b) Computer models are of little practical use.	54 (48.2)	25 (22.3)	25 (22.3)	5 (4.5)	3 (2.7)	1	
c) Models are too complicated to understand.	51 (48.6)	31 (29.5)	20 (19.0)	2 (1.9)	1 (1)	1	
d) Computers allow too much control by data processing personnel.	59 (55.7)	30 (28.3)	15 (14.1)	0	2 (1.9)	0	
e) Our administrators do not like to use keyboards.	42 (40)	15 (14.3)	29 (27.6)	13 (12.4)	6 (5.7)	1	
f) Decision making is largely political.	37 (34.9)	26 (24.5)	31 (29.3)	9 (8.5)	3 (2.8)	1	
g) Our administrators do not have time to learn modeling skills.	26 (23.9)	25 (22.9)	30 (27.5)	15 (13.8)	13 (11.9)	2	
h) Micro computers and programs are too expensive for this district.	29 (26.1)	24 (21.6)	28 (25.2)	11 (10)	19 (17.1)	2	

control if computer models are used, and 14.1% are unsure. The large percentage of districts unconcerned about control by data processing personnel should be viewed with caution. In many small and medium sized districts all financial data are processed by employees of the treasurer's office, and there are no separate departments or personnel for data processing.

Part e is concerned with whether or not administrators like to use keyboards to input data for computer models. The replies indicate that administrators are not unduly anxious about using keyboards. Fifty-seven respondents, or 54.3%, disagree with the statement that administrators do not like to use keyboards, and 27.6% are uncertain. However, 18.1%, agree strongly that their administrators do not like to use them. If decision makers are not comfortable with using keyboards, it is unlikely they will adopt micros and models for financial planning.

Part f of the question deals with whether or not decision making is perceived as largely political. This statement has the largest number neither agreeing nor disagreeing (29.3%). Only 11.3% of those answering strongly agree with the statement that decision making is largely political. The rest (59.4%) disagree with the statement.

Part g is concerned with whether or not administrators have time available to learn modeling skills. The respondents show little agreement among their answers. Fewer than half (46.8%) indicate that administrators have time to learn modeling skills, 27.5% are not sure, and one quarter (25.7%) agree that their administrators do not have the time.

Part h indicates that micro computers and programs may be too expensive for the district. There was less agreement among replies to this statement than any other. Hardware and software are not too expensive for 47.7% of the districts, are too expensive for 27.1%, while the remaining one fourth (25.2%) of the respondents are unsure.

While the answers to parts g and h do not show clearly that lack of expertise and money are the most important reasons for not using computerized financial planning, they are the only parts of the question on which fewer than

half of the respondents disagree with the statement. Replies to question 6 (see below) also mention these two obstacles as being most important.

Question 6 is open-ended and asks for other reasons why computerized financial planning is not used. Eighty-three districts replied to this question. Answers are classified into six groups depending upon the reasons mentioned. Figure 5-10 shows the number of answers in each group with some replies being included in more than one group. Lack of money and expertise are mentioned by 72.3% of the respondents.

FIGURE 5-10

OTHER REASONS WHY DISTRICTS DO NOT USE
COMPUTERIZED FINANCIAL PLANS

	Times Mentioned	% of Replies	% of School Districts
District is too small to warrant plan.	4	4.0	4.8
Lack of time to start up and learn.	6	6.1	7.2
District is in process of computerizing.	10	10.1	12.0
Software is not available.	13	13.1	15.7
Administrators lack expertise.	27	27.3	32.5
District lacks funds.	33	33.3	39.8
Other reasons (listed below)	6	6.1	7.2
	----	-----	
Total number of answers	99	100.0	
No. of districts replying <u>83</u>			

(Some districts gave more than one reason; therefore, percentages total more than 100%.)

Additional reasons mentioned include: treasurer new in the district, waiting for state software to be available, board not interested, not enough historical data, incompatible software in past years, and unwillingness to change.

Lack of funds was mentioned more than any other reason for not using computerized financial plans in the open ended question. However, when specifics of how wage and salary negotiations are conducted were described in answer to another part of the questionnaire, 45.6% of districts with non-computerized financial plans and 40.4% of districts without plans said they use a computer for these calculations. We can surmise that for these districts the

purchase of hardware is not a barrier since they already own a computer. The other costs of computerizing financial planning are purchase or development of appropriate financial planning models. Since so many districts already own hardware, the cost of developing appropriate models combined with lack of expertise seem to be the principal reasons districts do not utilize their computers for financial planning.

CONCLUSION - There is some support for hypothesis 3 since lack of money and expertise were mentioned most often by respondents who are not using computers for financial planning. The cost of administrative time to spend developing expertise and designing software or models could be prohibitive for some districts. For others, these human resource costs, in addition to the cost of purchasing hardware, are too expensive.

Prior research described in Chapter 4 indicates that lack of money and expertise are the reasons for lack of computerization in the 1970s and early 1980s (Cardinale, 1981; Glose, 1977). However, many of the districts (38%) responding to this questionnaire already own computers, most of them micros, so the cost of hardware is not a deterrent for them. The problem which has developed, as Grafton and Permaloff (1985) point out so clearly, is that the rapid drop in the cost of micro computers occurred at the same time the cost of purchasing or developing software was rapidly increasing. It appears that the two main reasons school districts have not initiated computerized financial planning are (1) the cost of developing financial planning models which meet the specific needs of school districts and (2) the lack of expertise to develop these models. However, during the late 1970s "the cost of delivering computer power dropped below the cost of having people do comparable work" (Jones, 1984, p. 170). Perhaps the lower costs of micros and the availability of a model developed specifically for school districts will encourage more school districts to computerize their financial planning.

HYPOTHESIS 4 Most school districts which do not use computerized financial plans would consider using financial planning models if they were designed specifically for school districts.

Question 7 asks if school districts would consider using computerized financial planning models which were specifically developed for Ohio school districts.

The replies are shown in Figure 5-11. Of the 143 replies, 96.5% answered affirmatively. Of the districts with financial plans, 93.3% are interested in computerized models, and 100% of those without financial plans who think they need them would consider computerized models designed specifically to meet the needs of school districts in their State.

FIGURE 5-11

SCHOOL DISTRICTS WHICH WOULD CONSIDER
USING COMPUTERIZED FINANCIAL PLANNING MODELS

SCHOOL DISTRICTS	YES (%)	NO (%)	No. of Replies
With Financial Plan (FP)	70 (93.3)	5 (6.7)	75
Without FPs but need one	68 (100)		68
	-----	-----	----
Replies to question and Percent of total replies	138 (96.5)	5 (3.5)	143

CONCLUSION - There is much support for hypothesis 4 as shown by the overwhelming affirmative response to question 7. Approximately ninety-six percent (96.5%) of all responding districts which do not conduct computerized financial planning would consider using a computer model for financial planning if one were developed to meet the needs of their districts. Lack of money, expertise, or specific models which meet the needs of school district financial planning are reasons given for not computerizing by 88% of the districts in this survey as shown in Figure 5-10. Although some districts which are interested in a financial planning model own micros and use spreadsheets for wage and salary negotiations, they have not purchased or developed their own computer models for financial planning. An inexpensive generic model which meets the specific needs of school districts and is designed for use on a micro computer is shown to be needed by a sufficient number of school districts to justify such a project.

5.7 ANALYSIS OF QUESTIONNAIRE RESPONSES BY OBJECTIVES

The objectives of this research are listed in Chapter 1 and repeated here. They are to

1. determine if a significant number of school districts in the United States use computerized financial planning,
2. identify the factors which inhibit or advance the use of computerized long range financial plans in school districts,
3. adapt or develop a computerized financial planning model to assist school district decision makers with long range financial planning.

OBJECTIVE 1 of this research is **to determine if a significant number of school districts in the United States conduct computerized financial planning**. The strong support shown for hypothesis two satisfies the first objective. Figure 5-6 shown above demonstrates that few school districts in Ohio use computers for financial planning.

OBJECTIVE 2 of this research is **to identify the factors which inhibit or advance the use of computerized long range financial plans in school districts**. This objective is satisfied by completing the analysis for hypothesis three. Figures 5-9 and 5-10 shown above indicate some of the reasons why districts do not use computerized financial models for planning.

To find out more about factors which advance or inhibit use of models, respondents were asked about the people who participate in financial planning. If the district does not conduct financial planning, the question sought to identify persons who are part of the budgeting process. The assumption is that persons who make budgeting decisions are the ones who would participate in financial planning if the district were to adopt a financial planning model. Figure 5-12 shows the people who participate in financial planning and/or budgeting.

As shown in Figure 5-12, replies to the question indicate that treasurers (99%) almost always take part in financial planning or budgeting. Superintendents, too, frequently participate (94%). Many districts (36.7%) indicate that board members rarely take part in the process; however, in other districts (28%)

FIGURE 5-12
 PARTICIPANTS IN FINANCIAL PLANNING/BUDGETING

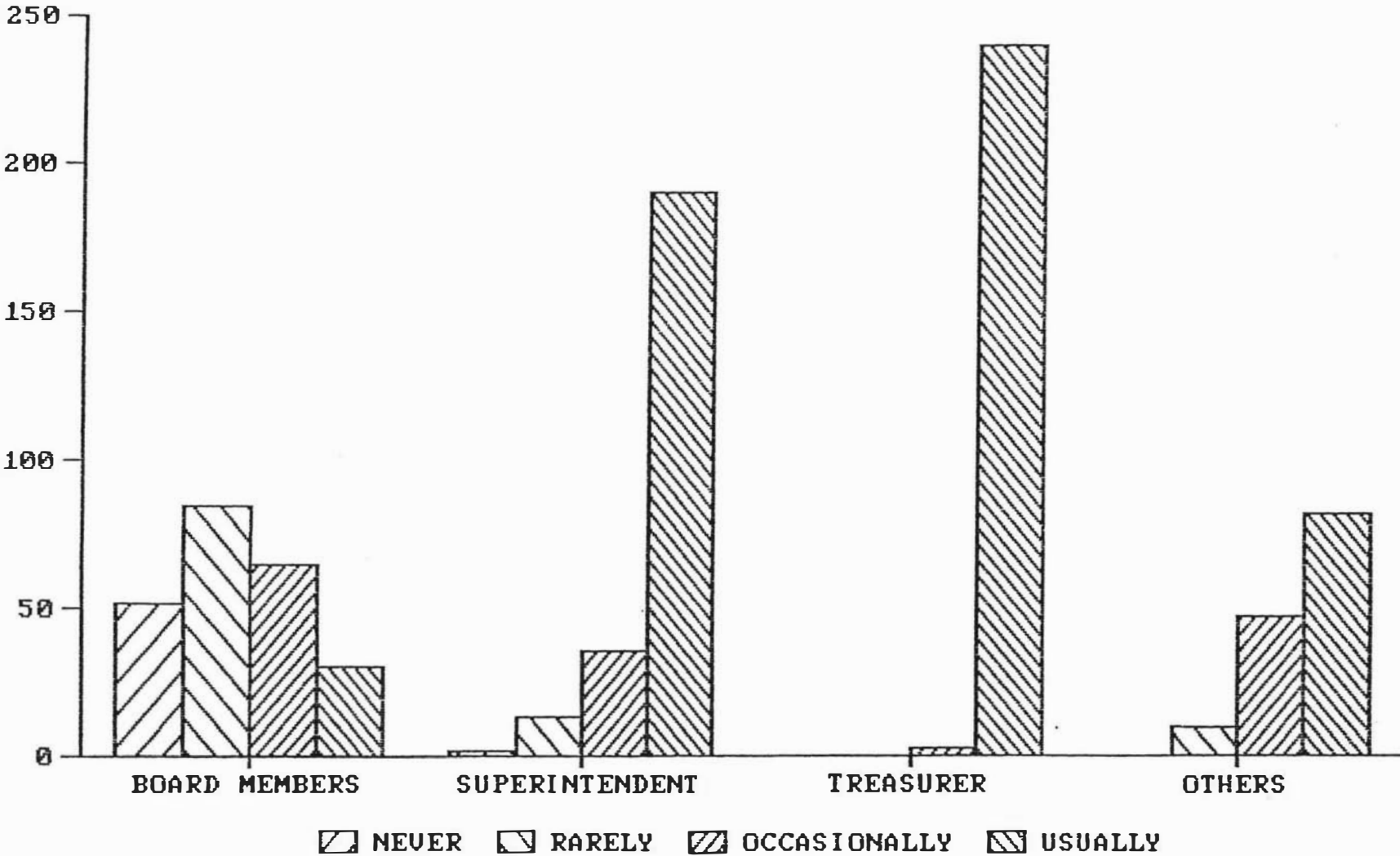


FIGURE 5-12

board members occasionally participate. Other people who occasionally take part are principals, assistant superintendents, curriculum directors, business managers, department heads and supervisors. Only one district mentioned teachers as participants in financial planning or budgeting. None of the districts mentioned data processing personnel, unless they were classified as department heads or supervisors.

Knowing who participates in financial planning helps the modeler determine how technical the model should be, just as knowing the barriers which inhibit use of computerized financial planning enables the modeler to avoid them.

OBJECTIVE 3 of this research is **to adapt or develop a computerized financial planning model to assist school district decision makers with long range financial planning**. Therefore, many of the questions in the questionnaire were designed to assist in the adaptation or development of such a model(s) if school districts showed an interest in using one. Although the need for this research is not dependent on statistical proof (the literature indicates that financial planning would be helpful for school districts), hypothesis 4 indicates that an overwhelming number of Ohio school districts (96.5% of respondents) would consider using a computerized financial planning model if it were designed specifically for them. To fulfill this need, the literature-based integrated financial planning model shown in Chapter 4 is refined based on additional empirical work analyzed in the next chapter.

To assist in the model design, all districts were asked at what level of aggregation financial planning and budgeting are conducted. The researcher had hoped that one question or the other would be answered, depending upon whether or not a district's financial planning extended beyond the budget year. Interestingly, most districts answered for both financial planning **and** budgeting even when they had stated that they do not have a financial plan. Many of the districts which answered this question budget or conduct financial planning on more than one level of aggregation, so the total number of answers shown is greater than the number of districts answering the question. The number of districts shown at each level in Figure 5-13 represents all those who checked that level of budgeting or financial planning.

FIGURE 5-13
LEVELS OF BUDGETING AND
FINANCIAL PLANNING

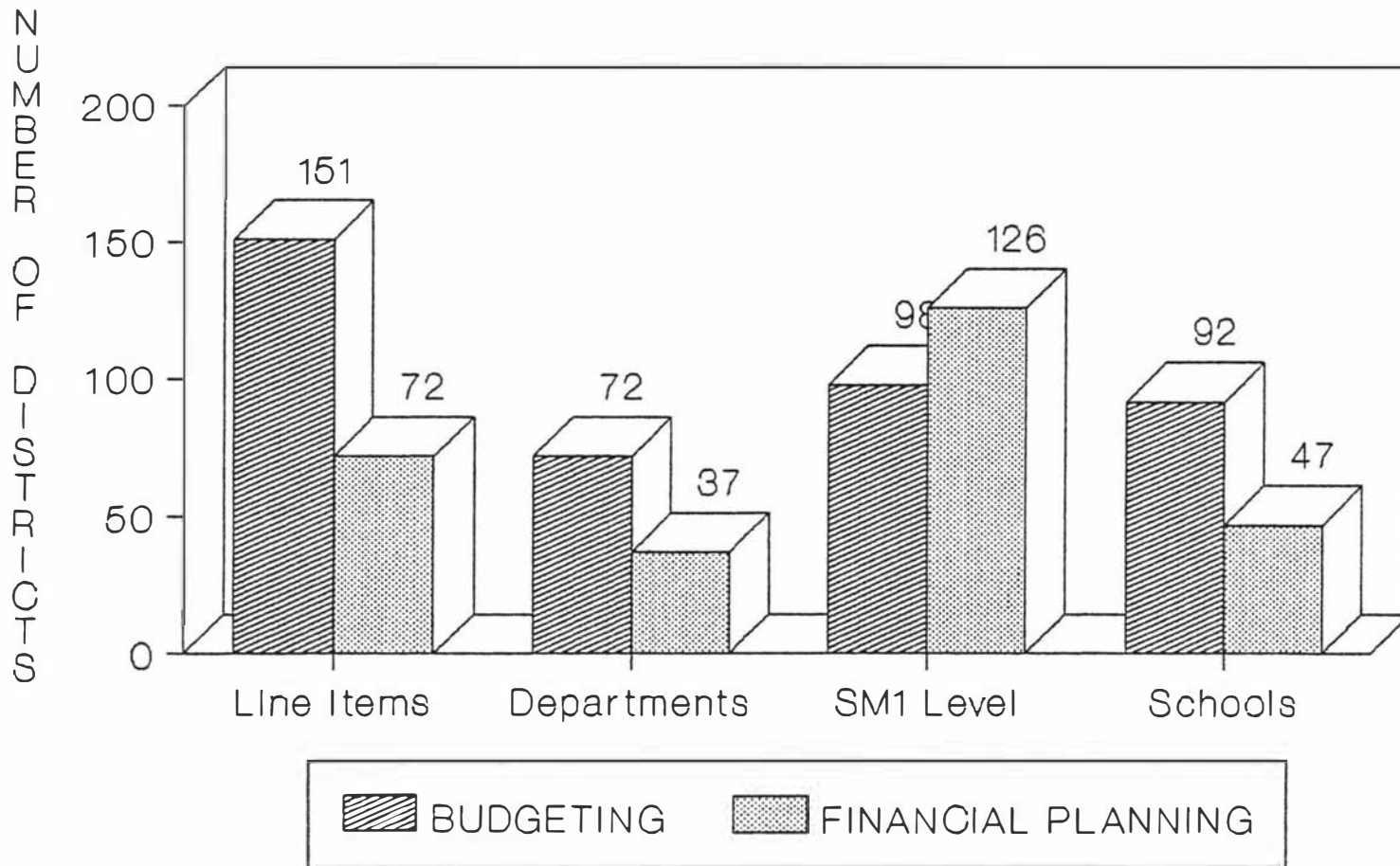


FIGURE 5-13

It is clear from these replies that most financial planning is at the object code level (used on cash flow form SM1 in the State of Ohio), while resources are budgeted by line items. It is not surprising to find that financial planning is conducted at this level of aggregation since receipts and expenditures are aggregated by object code for cash flow reports which must be submitted quarterly. The cash flow reports, SM1 (annual report) and SM2 (quarterly report), are described in Chapter 2 as one way school districts are accountable to their state governments.

Pratt (1985) found support for aggregation of numbers for financial planning in his research of United States colleges and universities as follows:

high levels of aggregation are appropriate for policy making and lower levels for budget development, with the exception that revenue for both planning and budgeting would seem to be aggregated (p. 239).

Similar aggregations of numbers were used by Lee (1982) and Smith (1985) as primary sources of data for their studies of school districts' fiscal health. They both used year end SM2 reports from all of the school districts in the State of Ohio to project when districts will not have sufficient funds to start another year.

Knowing who takes part in financial planning and/or budgeting is important information when developing a model for school districts. This is discussed above under objective 2. This information enables the modeler to adapt the model to the technical level of the user. While the people who plan and the level at which planning is done are important to the modeler, the barriers which prevent acceptance of computerized financial planning models must also be determined. These are discussed above under hypothesis 3 and objective 2.

Some of these barriers can be overcome by specifically designing a model for school districts which is inexpensive to buy, simple to understand and fairly easy for decision makers to manipulate. Glose (1977), in his survey, found this to be true before 1977. He also found that respondents to his survey preferred a non-computerized model. It is unlikely, however, that models designed for manual calculations are acceptable more than a decade later. A financial planning model for school districts should be designed for use on a micro, not only because many districts already own this type of computer (33.7% of all

responders indicate micro ownership), but also because micros compute timely "what if" alternatives which enhance the planning process.

It is postulated that guidelines for adapting a generic financial planning model can provide ways for school district decision makers to gain expertise inexpensively if the districts lack money as well as expertise. It is suggested that state associations, state boards of education or state auditors can provide training and assistance with implementation. This subject will be dealt with more thoroughly in Chapter 8.

5.8 SUMMARY

Hypotheses developed from the literature are listed in this chapter with the empirical work (interviews and questionnaire) undertaken to substantiate them. They demonstrate the need for the development of a computerized financial planning model for school districts. Specific questions in the questionnaire are related to each hypothesis and to the objectives of the research. Replies to these questions are analyzed.

Answers are given for the questions asked at the conclusion of Chapter 4 which seek to discover the extent of long range financial planning and modeling in school districts and the need, if any, for financial planning models. In addition, interviews related to the need for this project are described.

5.9 CONCLUSIONS

The empirical work designed to test the hypotheses listed in this chapter fills "holes" in the literature concerning financial planning and the use of financial planning and computerized financial planning models in school districts. When this research was first proposed, there was the possibility that school districts might have developed their own financial planning models using spreadsheets on micros. If a significant number of school districts had such models, this current study might not have been needed. However, this research demonstrates the following:

- * More than half (54.2%) of the respondents stated that they have a financial plan which extends beyond the following year's annual budget.
- * Most (85.1%) of the respondents to the survey who indicate that their districts have not developed financial plans think they need them.
- * Only 20.5% of all respondents are currently operating computerized financial planning models.
- * More than ninety-three percent (93.3%) of districts which already have financial plans are interested in computerizing those plans if a satisfactory model is developed.
- * Almost all respondents (96.5%) with financial plans or who think they need one would consider using a computerized financial planning model specifically designed for school districts.
- * Lack of computer models which meet the special needs of school districts and lack of money and expertise to develop their own models seem to be the main reasons that districts are not using computerized financial planning.
- * No models were found which could be adopted intact for a generic model for school districts.

Since the literature suggests that few, if any, computerized financial planning models are in use in school districts, questions about how their models are designed and used are asked of district treasurers whose financial planning is computerized. Their answers are analyzed in Chapter 6 where the literature-based model described in Chapter 4 will be refined by the author's empirical work. Additional holes or gaps in the literature related to model design for school districts will be addressed.

After the model developed by this research has been in operation for a period of time, empirical research should be carried out to determine if barriers to financial planning models in school districts still remain.

REFERENCES

CHAPTER 5

- Adams, E.K. (1980). *Fiscal response and school finance simulation: A policy perspective*. (Report No. F80-3). Denver, CO: Education Commission of the State. Education Finance Center.
- Cardinale, O. (1981). On a generic management information system model with applications to public school systems. *Dissertation Abstracts International*, (University Microfilms No. AAD82-03949).
- Christman, L.H. (1982). *Streamlining local school budgeting in Ohio*. Cleveland, OH: Citizens' Council for Ohio Schools. (ERIC Document Reproduction Service No. Ed 233 457).
- Cibulka, J.G. (1987). Theories of educational budgeting: Lessons learned from the management of decline. *Educational Administration Quarterly*, 23(1), 7-40.
- Cohen, M.C. (1983). Tax capacity, tax effort, and state funding of schools in Ohio. *Journal of Educational Finance*, 9(2), 141-156.
- Costs per pupil*. (1986). Columbus, OH: Department of Education, Division of Computer Services and Statistical Reports.
- Glose, G.P. (1977). A long range financial planning/forecasting model for local school districts. *Dissertation Abstracts International*, (University Microfilms No. AAD78-14000).
- Grafton, C. & Permaloff, A. (1985). Budget implementation with microcomputers. *Public Productivity Review*, 20, 202-212.
- Jones, K.M. (1984). Implementing optimization in a decision support system. In T.H. Naylor & C. Thomas (Eds.), *Optimization Models for Strategic Planning*. (pp. 169-173). Amsterdam: Elsevier Science.

(References continued - Chapter 5)

- LaMorte, M.W. & Williams J.D. (1985). Court decisions and school finance reform. *Educational Administration Quarterly*, 21(2), 59-89.
- Lee, R. (1982). *Financial and staffing ratio analysis: Predicting fiscal distress in school districts*. Unpublished doctoral dissertation, Ohio State University.
- Martin, D.B. (1987). *Long range planning for school districts*. Westerville, OH: Ohio School Boards Association.
- Matthews, K.M. & Holmes C.T. (1984). Implications of regional cost adjustments to school finance plans. *Educational Administration Quarterly*, 20(1), pp. 69-92.
- National Education Association. (1984). *Estimates of school statistics, 1983-84 as provided by the state departments of education*. Washington, D.C.: Author, Research Division.
- National School Board Association. (1988). Money still is your top problem, but curriculum is making a big comeback. *American School Board Journal*. Washington, D.C.: Author.
- Pratt, M.J. (1985). *Computerized support for financial planning in South Africa universities*. Unpublished doctoral dissertation, University of South Africa.
- Smith, K. (1985). *Forecasting school district fiscal health*. Unpublished doctoral dissertation, Ohio State University.

CHAPTER 6

EMPIRICAL WORK RELATED TO DESIGN OF FINANCIAL MODELS AND DETAILED DESCRIPTION OF FINAL MODEL

6.0 INTRODUCTION

Chapter 2 discusses school district organization and the special financing problems which are specific to school districts. In Chapter 3 a theoretical basis for financial planning for school districts is developed from extant literature. Chapter 4 contains relevant research related to school district financial planning and presents a normatively derived integrated financial planning model for school districts based on the literature. Chapter 5 analyzes the empirical work undertaken to discover if school districts conduct financial planning, to test the hypotheses and to promote the objectives of this research. This chapter analyzes the research undertaken to discover how school district financial planning models are designed and operated.

In this chapter, questionnaire replies on model design are used to modify the main model and three sub models. Only school districts which currently operate financial models answered this section of the questionnaire. These school districts also responded to the questions at the conclusion of Chapter 4 that relate to computer model design in school districts. The answers to these questions are not found in extant literature. At the conclusion of this chapter the main model and sub models which are based on the literature and empirical research are described in detail.

The chapter is composed of the following sections:

- 6.0 Introduction
- 6.1 Analysis of Questionnaire Responses
 - 6.1.1 Districts Which Use Computer Models
 - 6.1.2 Number of Years Districts Have Used Models
 - 6.1.3 Models Used for Decision Making
 - 6.1.4 Purposes for Which Computers are Most Helpful

- 6.1.5 Initiators, Operators and Designers of Models
- 6.1.6 Administrators' Personal Models
- 6.1.7 Statistical Techniques Used in Forecasting
- 6.1.8 Uncertainty
- 6.1.9 Computer Programs
- 6.2 Enrollment Forecasting Sub Model
- 6.3 Staffing Sub Model
- 6.4 Financial Planning Sub Model
- 6.5 Final Integrated Academic and Financial Planning Model
- 6.6 Summary
- 6.7 Conclusions

6.1 ANALYSIS OF QUESTIONNAIRE RESPONSES

Chapter 5 analyzes responses from 266 Ohio school districts to discover whether or not school districts have long range financial plans and who participates in budgeting and/or financial planning decisions. This chapter analyzes responses from the 59 (22.2%) of those school districts who stated that they use computer financial models (See Figure 6-1). Information relating to computer design and use was solicited from these districts to answer the remaining questions at the conclusion of Chapter 4.

6.1.1 DISTRICTS WHICH USE COMPUTER MODELS

Fifty four (91.5%) of the 59 districts which use computer models have long range financial plans; the other five (8.5%) do not, but they use computer models for some financial decisions. Of the 54 who have financial plans, 37 (68.5%) operate them on micro computers; the other 17 (31.5%) are installed on minis or mainframes. The questions analyzed below deal with the design and use of financial models.

FIGURE 6-1
DISTRICTS WHICH USE COMPUTER MODELS

	Number of Districts	Percent of Sub Total	Percent of Total Replies
With financial plans			
On Micro	37	68.5	62.7
Mini or Mainframe	17	31.5	28.8

Sub total with plans	54		
No financial plans	5		8.5
	----	-----	-----
Total replies to this question	59	100	100

Most of the school districts that have computerized their financial planning use micros for this process. This supports the literature which suggests that micros, in preference to minis or mainframes, lend themselves to the planning process (Grafton & Permaloff, 1985; Milter & Rohrbaugh, 1985; Pratt, 1985). The final model is designed for use on a micro computer.

6.1.2 NUMBER OF YEARS DISTRICTS HAVE USED MODELS

School districts were asked how long they had used financial models. Fifty-five districts (93.2%) who said they use financial models answered this question. The maximum number of years was eight (2 districts, 3.6%), and the minimum was one (8 districts, 14.5%). The average for all 55 districts was just over three years. These answers suggest that financial models have not been used in most school districts for long periods of time and may explain why so little information about school district financial models is available in the literature.

6.1.3 MODELS USED FOR DECISION MAKING

School district treasurers were asked to indicate how often certain types of decisions are made in their district, if modeling is used, and if they find modeling useful for these decisions. Their replies are shown in Figure 6-2.

The answers to this question suggest that the 54 school districts which operate computer models do not employ them for more than half of all decisions. The greatest use of computer models is for staffing decisions (59.3%), and the

models indicated as being most useful are those for enrollment forecasting (95.8%). These two kinds of decisions are shown in the literature to be most important for school districts (Glose, 1977; Smith, 1985) since they affect the majority of school district expenditures. The final integrated model will contain sub models to assist decision makers in these two areas.

FIGURE 6-2

MODELS USED FOR DECISION MAKING

VF = very frequently (more than once a month)
 F = frequently (several times a year)
 I = infrequently (once a year or less)
 N = never

DECISION	HOW OFTEN? (VF,F,I,N)	Median	MODELING? (Check if YES)	MODELING? USEFUL?
			Number (%) (of total replies)	Number (%) (of districts modeling)
Cash Planning	37,13,2,2	VF	26 (48.1)	22 (84.5)
Capital Projects	7,28,11,7	F	18 (34)	17 (94.4)
Staffing Planning	9,32,11,2	F	32 (59.3)	30 (93.8)
Enrollment Forecasting	2,29,14,8	F	24 (45.3)	23 (95.8)

Since cash planning and investment decisions are required more frequently than others, it is surprising that computer models are not operated more often for these decisions. This could be an interesting area for further research.

Replies which relate to each of the four areas of decision making listed in Figure 6-2 above will be discussed in detail below.

Cash Planning and Investments

The first question concerned decisions involving short or medium term cash planning and investment of surplus funds. Of the 54 districts which answered this question, 68.5% make these decisions more than once a month, 24.1% several times a year, and the rest (7.4%) less than once a year or never. Of the respondents, 48.1% use modeling for these decisions, and of these 84.5% find modeling useful. Of the total responding, therefore, 40.7% find modeling

useful for cash planning and investment decisions. Additional research is needed, perhaps case studies, to determine if districts using computer models for cash planning and investments earn a higher return on their investments than districts which do not use this method to aid decision making.

Earnings on investments in the literature-based model were forecasted as a ratio based on the previous year's relationship between investment earnings and total receipts. The choices of which percentages to use in future years are primary planning variables (PPVs) since decision makers determine the percentage of the prior year's total revenues which are likely to represent investment earnings in the following year. Investment earnings reflect investment and borrowing policies of the district as well as cash available for investment, and these policies can be changed over the years. To help decision makers determine the percentage to use for future years, the ratio for the past three years will be an output of the historical financial data. Unless interest rates on investments are expected to increase or decrease dramatically or the school district expects a great difference in cash balances, historical ratios may indicate future earnings on investments.

Capital Projects

Of the 53 districts responding to questions directed at capital project decisions, 13.2% made these decisions more than once a month, the majority (52.8%) several times a year, 20.8% once a year or less, and 13.2% said they never made these decisions. Only 34% of respondents to this question used modeling for these decisions, but of those who did use modeling, 94.4% found it useful. Therefore, only 32% (17 districts) of all the districts (53) which answered this question about capital project decisions found modeling useful for these decisions, although they make these decisions frequently.

No questions were asked about whether these capital projects are part of the general fund or whether they are expenditures of permanent improvement funds, although this would be interesting to discover. The existence of a separate fund for permanent improvements could release general fund monies for expenditure elsewhere, and such a fund is considered (by an office of the Ohio Department of Education) as one indication of good fiscal health (Smith, 1985, p. 86). Capital projects are not usually a large part of the general fund,

and prior research suggests that capital expenditures from the general fund are of relatively low importance in predicting fiscal health (Smith, 1985, p. 125). Capital purchases, with the exception of bus purchases, were originally forecasted in the literature-based model. However, capital purchases were changed from a percentage of the previous year's expense to a dollar amount (PPV) for each of the forecasted years. This is because decision makers can move forward or delay capital purchases from the general fund at their discretion or, if the district has a separate fund for permanent improvements, remove some capital projects from the general fund altogether.

Staff Planning

Treasurers were asked how often staff planning decisions were made, whether modeling was used, and if modeling was useful for making these decisions (See Figure 6-2).

Fifty-four districts answered this question. Most districts said they make these decisions frequently (59.3%) or very frequently (16.7%). Approximately twenty percent (20.3%) make these decisions infrequently, and the rest (3.7%) marked "never". Thirty-two (59.3%) of the districts use modeling for staff planning decisions, more than use modeling for any of the other decisions listed. Thirty (93.8%) of the districts which use modeling find it useful. Hence, more than half (55.6%) of the treasurers answering this question frequently use modeling for staffing decisions and find modeling useful.

Most staffing decisions involve the number of teachers required by the district. The number of teachers (majority of the staff in numbers and costs) to be employed by a district depends upon enrollments, academic programs, and acceptable pupil/teacher ratios. Enrollments are exogenous variables and will be discussed below. The other two staffing variables are PPVs which help determine personnel costs. These costs comprise the largest expenditure of school districts and depend upon staffing decisions, salary and/or wage rates, and fringe benefits. Because the staffing sub model is the place where PPVs reflect both the academic program and the financial costs of staffing decisions to produce that program, the staffing sub model is an integral part of the main model. The sub model will be described in detail later in this chapter (Section 6.3).

Enrollment Forecasting

School district treasurers were asked how frequently they make enrollment decisions, whether or not they use modeling for these decisions, and if they find modeling helpful (See Figure 6-2).

Thirty-one (58.5%) of the 53 treasurers who responded said they make these decisions frequently or very frequently. Twenty-four (45.3%) use modeling for making these decisions, and of these respondents, 23 (95.8%) found modeling useful. It is unclear just what kinds of enrollment decisions are required as frequently as several times a year since the decisions based on enrollment forecasts are staffing and building needs. These types of decisions affect districts for long periods of time. Enrollment forecasts, academic programs, and pupil/teacher ratios are prime determinants of personnel costs as stated above. Enrollments are an exogenous variable and therefore cannot be controlled by school district decision makers. However, because of the importance of enrollments to all school district planning, the sub model for enrollments is integrated with the main model.

Replies to questions about how enrollments are being forecasted currently in school districts will be discussed in the section dealing with the enrollment forecasting sub model (Section 6.2) of the main model. This will include a detailed description of the sub model for enrollment forecasting as it appears with the final model.

Summary of how Models are used for Decision Making

According to the treasurers responding to the questions relating to models operated for decision making, computer models are used most often for staffing, enrollment, and cash planning decisions. They are used less often for capital projects decisions. Consequently, the final integrated academic and financial planning model will concentrate on the areas of staff planning and enrollment. Cash planning and investment decisions depend on the amount of inactive cash available for investment, a function of daily cash balances and borrowing decisions. This financial planning model is concerned with the long term and will not assist with daily or monthly cash planning and investment decisions. However, cash decisions are very important to financial planning. The outputs of the financial planning sub model are year end cash balances,

treated in this model as constraints, and the model is run iteratively until these balances are satisfactory. The model will not address investment decisions nor forecast annual investment earnings ratios which are PPVs. Although investment earnings were forecasted in the Chapter 4 Model based on prior year expenditures, it is likely that prior year's total resources (beginning balance plus receipts) are a better base for the earnings ratio since large cash balances suggest that inactive funds are available for investment. Since investment earnings are directly affected by investment and borrowing policies of the school board which may change policies at will, the investment earnings ratio, that is, earnings as a percent of prior year's resources, must be a PPV. No specific changes which resulted from replies to these questions were made in the final model.

6.1.4 PURPOSES FOR WHICH COMPUTER MODELS ARE MOST HELPFUL

School districts were asked to indicate the three areas in which computer models have been most helpful in their district in order to guide the author in the design of the final model. Treasurers were to indicate the most helpful as "1", the next most helpful "2", and the next "3". Unfortunately, some respondents merely checked several of the five suggestions or listed other ways models are helpful without prioritizing them. In these instances the author weighted all of their answers as though they had been marked "2". Suggested ways models are helpful and the number of replies received for each are shown below.

FIGURE 6-3

PURPOSES FOR WHICH COMPUTER MODELS ARE MOST HELPFUL

Models help	NUMBER OF REPLIES
a) our district to make better decisions.	38
b) our decision makers to better understand finances.	55
c) to communicate financial decisions to board members.	44
d) to communicate financial decisions to staff.	20
e) schools and departments to make claims for district resources.	11

f)	List other ways computer models help.		8
	forecasting	(2)	
	plan levies	(3)	
	negotiations	(1)	
	project current year's expenses	(1)	
	communicate with staff, internal control and feedback	(1)	

The statement receiving the most number "1"s (16), indicating the way computer models are perceived to be most helpful, is "b" which refers to better understanding of finances by decision makers. This statement also received more total marks (55) than any other. Since only 56 districts answered this question, 98.2 % of respondents rank this as one of the three most important ways in which computer models help their district. This supports the literature which suggests that models are useful for helping decision makers to understand problems (Harris, 1983, p. 129; Hopkins & Massy, 1981, p. 16; Pratt, 1985, p. 237). The integrated model developed in this research is designed to help decision makers understand the financial implications of academic decisions.

The statement ranking second for overall marks (44) suggests that computer models help communicate financial decisions to board members. This finding supports the literature which suggests that models are helpful for communicating information to decision makers (Jones, 1984, p. 171). Surprisingly, the statement that models are helpful for communicating financial information to staff received few marks (20) and ranks fourth overall. An example of how financial forecasting models can be used for communicating to the public was demonstrated by an Ohio school district treasurer who described to the author on January 5, 1988, how and why her district had completed its first five year plan. Enrollments in this district are increasing, but financial forecasts show a steady deterioration of the cash balance at the end of each fiscal year. The plan was produced and highly publicized to alert the community to the need for additional levies for each of several years into the future even though a levy had been passed in early 1986. The final integrated model developed in this research can be operated by administrators and board members to assist them in understanding the financial effect of academic decisions.

The statement receiving the second highest number of "1"s (15) ranks third in total number of marks (38). It states that computer models help districts to

make better decisions. This is a surprising response since replies to a recent survey (Harris, 1983, pp. 127, 130-132) of decision makers in colleges and universities indicated that this was not a significant benefit of modeling. Respondents to the earlier survey mentioned technical benefits (modeling saves tedious calculations) as most important, whereas none of the school districts mentioned these benefits. Perhaps rapid changes in technology are now being taken for granted, and the educational and communication aspects of modeling are being recognized as valuable to decision makers.

The three areas where computer models are most helpful in the school districts responding to this survey are clearly to:

- (1) help decision makers better understand finances,
- (2) communicate financial decisions to board members, and
- (3) help the district make better decisions.

These three statements received 137 (77.8%) of the total marks. The integrated academic and financial planning model developed from this research is designed to help school district decision makers in all three of these areas. Some of the questions asked of evaluators of the model will deal with how well the model helps school district decision makers in these ways. Chapter 7 will give the results of the testing process.

6.1.5 INITIATORS, OPERATORS, AND DESIGNERS OF MODELS

Of the 58 districts which responded to the question asking who initiated models in their district, 63.8% marked "treasurer", 32.8% checked "superintendents", and only 3.4% answered "school board". Only 41 districts (70.7%) answered the question about operators of computer models. The treasurers operate them in 80.5% of the districts and superintendents in the other 19.5%. No other persons or positions were listed as initiators or operators of models although space was available for listing "others". It is interesting that no data processing personnel were mentioned as initiators or operators. Since treasurers and superintendents, not computer technicians, are the probable operators of the final integrated model being developed here, the model will be simple to understand, to implement, and to operate. An earlier question (p. 172) asked if administrators objected to using keyboards for entering data.

Replies indicate that most (54.3%) school districts do not consider this a problem.

All except 26% of models used by responding school districts are designed by their own personnel. More than half of them (52.1%) are designed by the treasurer, superintendent, or other administrators. Business managers (5.5%), and directors (8.2%) of personnel, curriculum, finance, data processing, and budget designed a total of 13.7%. An additional 8.2% were designed by staff from the computer department or the treasurer's office. Of those with models designed outside the district (26%), only two (10.5%) districts mentioned state software; the other 17 (89.5%) were designed by outside consultants. Answers to these questions suggest that generic models which meet the needs of school districts are unavailable; therefore, some districts design their own. This research has shown (Figure 5-11, p. 174) that an overwhelming number of responding school districts (96.5%) would consider using a computerized financial planning model if it were designed to meet the needs of school districts; however, the cost and lack of expertise to design their own models were identified as barriers to computerized financial planning. Therefore, the generic model for school districts developed in this research should be helpful for districts which lack the expertise or finances to design their own models.

6.1.6 ADMINISTRATORS' PERSONAL MODELS

Only 38.6% (22) of the 57 districts answering the question state that their administrators build and operate their own individual models. Those building their own models were asked for reasons and asked to check all those which apply. The replies suggested by the question and the number of marks each received are as follows:

- * The construction of models gives insight into policy decision variables.
10 replies (32.3%)
- * Useful models for school districts are not available.
9 replies (29%)
- * They prefer to control their own decision support system.
10 replies (32.3%)
- * They do not care to use other people's models which they do not understand.
2 replies (6.4%)

Answers to the first of the responses listed above agree with replies to the question in Section 6.1.4 which asks in what ways computer models are most helpful. Models appear to be important for understanding problems and gaining insight into decision making. Administrators who construct their own models are equally interested in controlling their own decision support system, an observation noted in the literature (Pratt, 1985, p. 253). The use of other people's models is not an issue among respondents to the above question. This agrees with the responses received by Pratt (1985, p. 237) from decision makers in colleges and universities in the United States. The generic model designed here is simple to understand and allows decision makers to remain in control of the model.

6.1.7 STATISTICAL TECHNIQUES USED IN FORECASTING

When asked what statistical techniques were employed for forecasting enrollment or expenses, 44 (84.6%) respondents checked historical trends (moving average, percentage of resources). The other 8 (15.4%) of the 52 total replies to this question indicated causal (e.g. multiple regression) techniques. These replies correspond to results of prior research (Glose, 1977) which indicates that most school districts prefer to use simple statistical techniques. The generic model developed in this research from the literature and empirical work utilizes simple statistical techniques which should be understood easily by decision makers as shown by the following examples:

The method used to forecast materials, supplies, and purchased services is a percentage growth on prior year's expenditures. These percentages could reflect the rate of inflation, an enrollment increase, or another percentage chosen by decision makers.

Future investment earnings are forecasted by ratios chosen by decision makers. Ratios of prior years' investment earnings as a ratio of prior years' resources are calculated in the model to assist decision makers.

A percentage of salaries and wages is recommended to decision makers for forecasting fringe benefits. The percentage is based on the relationship between fringe benefit costs and salaries and wages in past years.

School district replies to the question about statistical techniques preferred by them lend support for simple statistical techniques which are understood easily, like those used in the final integrated financial planning model.

6.1.8 UNCERTAINTY

Answers to questions about dealing with an uncertain future were answered by 43 districts. Districts were asked to check all of the answers which apply, and percentages are based on the 68 answers received. School districts deal with uncertainty by one or more of the following methods:

FIGURE 6-4

DEALING WITH UNCERTAINTY

	No. of Replies -----	% of Replies -----	% of Districts -----
Manipulating variables (What if?)	37	54.4	86
Stochastic variables (risk analysis)	7	10.3	16.3
Maintaining a reserve fund	17	25	39.5
Sensitivity analysis to determine critical variables.	5	7.4	11.6
Other	2	2.9	4.7
	----	-----	
Total replies to this question	68	100	
Districts answering question <u>43</u>			

Thirty-seven (86%) of the 43 districts answering this question manipulate variables to deal with an uncertain future. This supports research at colleges and universities (Pratt, 1985, p. 183) which indicates that "what if?" scenarios are preferred by educational institutions surveyed. Seventeen school districts (39.5% of the districts responding to the question) state that they maintain a reserve fund to deal with uncertainty. Since Ohio schools operate on a cash basis, the "reserve fund" is reflected in the cash balance at year end. Using the cash balance as a way to deal with uncertainty, as these districts do, supports the designation of year end cash balances as important endogenous outputs of the financial planning sub model.

Both of the districts which mentioned other ways in which they deal with uncertainty also manipulate variables. The other ways of dealing with uncertainty which they stated are (1) conducting needs assessment and (2) whatever yields significant information.

Twenty-nine (78.4%) of the 37 districts which manipulate variables as a method of dealing with uncertainty indicate they own micro computers. Of the remaining eight districts, five have mainframes, two have minis, and one district did not define its computer. This supports the literature which states

that micro computers are used more often for analysis because of the ease with which variables can be manipulated and greater access to the computers themselves (Grafton & Permaloff, 1985, p. 203). Ten (27%) of the districts who use micro computer financial planning models did not check manipulating variables as a method of dealing with uncertainty. However, seven of those ten districts did not answer the question at all; the other three stated that they maintain reserve funds.

The findings on school district practice appear to agree with those of Hopkins and Massy (1981) who state that dealing with uncertainty is a difficult task both in theory and practice. Pratt (1985) found that only 2% of the respondents to his survey of United States universities used sophisticated stochastic methodology and that most (76%) of them deal with uncertainty with simple "what if" analysis. The choice by school districts of manipulation of variables as the preferred method of dealing with uncertainty offers support for developing a non-stochastic model for school districts to be operated on micro computers.

6.1.9 COMPUTER PROGRAMS

In answer to the question asking for the names of programs run on school districts' mainframes, minis, and micros, 53 answers were received from the 59 districts. Only one district mentioned a program (ADEPT) for their mini. Seven districts listed program languages for their mainframes. The programs and the number of times they are mentioned are RPG (2), CADO (1), USAS (1), BASIC (1), and DOS (1). Two districts mentioned using state software on a mainframe. Half of the 44 districts (50%) stating the name of their micro spreadsheet programs wrote Lotus 1-2-3. The next most popular micro program is Visicalc (15.9%). Other programs mentioned (34.1%) were Multiplan, Symphony, and Appleworks. Because of the availability of Lotus 1-2-3 throughout the United States and because half of the school districts which operate micros use this program, the model will be designed for this type of spreadsheet.

In Ohio, school districts are required to balance their funding at year end. In other words, none of the funds may have a deficit balance. If financial institutions refuse to lend money to a school district to cover a deficit, that district is required to borrow from the Emergency School Assistance Fund

(ESAF) mentioned in Section 2.9, p. 34. The State Auditor's Office then closely monitors spending until two years after the loan is repaid. The computerized reporting program which has been developed for these troubled districts is in much greater detail than the SM1 and SM2 cash flow reports required from other districts. The program is based on Lotus 1-2-3 and, of course, requires the district using the program to have a micro computer. This adds additional support for basing the model developed in this research on a spreadsheet program designed for a micro. Because of the popularity and availability of micros and Lotus 1-2-3 in school districts, the final model developed in this research is coded for and operated with Lotus 1-2-3 or VP Planner (VP Planner can operate programs coded for Lotus 1-2-3).

6.2 ENROLLMENT FORECASTING SUB MODEL

The enrollment forecasting sub model is an integral part of the main model developed in Chapter 4. Although enrollments are exogenous to school districts, the enrollment sub model affects all aspects of the main model and is an essential part of the final model shown in Figure 6-4 at the conclusion of this chapter.

The literature-based financial planning model described in Chapter 4 contains an enrollment sub model based on the cohort method since it is the method preferred by most researchers. However, empirical work reported here shows that class progression is the most widely used method of forecasting enrollments. To discover how enrollments are currently being forecast by school districts which utilize computerized financial planning, the questionnaire asked several questions relating to decisions affecting these forecasts. The answers are analyzed in this section since they affect the development of an appropriate enrollment forecasting model.

As stated earlier in this chapter, school district treasurers were asked how frequently they make enrollment decisions, whether or not they use modeling for these decisions, and if they find modeling helpful. (See Figure 6-2).

Thirty-one (58.5%) of the 53 treasurers who responded said they make these decisions frequently or very frequently. Twenty-four (77.4%) use modeling for

making these decisions; and of these 24 respondents, 23 (95.8%) found modeling useful.

A question was asked about the methods used by treasurers for forecasting enrollments. They were asked to check all methods which apply. Forty-six treasurers indicated that they forecast enrollments by the following methods. The percentages of total answers received and of districts utilizing each method is shown below.

FIGURE 6-5
METHODS OF FORECASTING ENROLLMENTS

Methods	No. of Answers	% of Answers	% of Districts
Class progression	28	33.7	60.9
Birth records	24	28.9	52.2
Census	16	19.3	34.8
Cohort	11	13.3	23.9
Other (see below)	4	4.8	8.7
	----	-----	
Answers to question	83	100	
Districts replying <u>46</u>			

Other methods for forecasting enrollments were each mentioned once. They are: surveying construction of new homes, hiring outside consultants, saturation (the meaning of this answer is unclear), and population growth.

Of the 46 districts answering this question, 30 (65.2%) utilize more than one method of forecasting enrollments. Class progression is the most popular method (60.9% of the 46 districts) as well as the easiest to calculate. Classroom progression forecasts (e.g., estimating the approximate size of next year's fourth grade from the number of pupils in third grade this year) may need little or no modification when enrollments have been stable for several years and few changes in the environment are foreseen. Because the information is so easy to retrieve and is so intuitively accurate, the results of this method should be compared with any other enrollment forecasts to test their validity.

Five (20.8%) of the 24 districts which checked birth records as one method of forecasting enrollments use them as part of the cohort survival method (see

below). Unfortunately, districts were not asked to explain how birth records are used (other than with the cohort method) to predict how many children born in a district will be enrolling in public schools five or six years later in the same district. Some of the families may move out of the district before then, and some of the children may attend private schools.

The most reliable method of forecasting enrollments for the current year is to survey all of the families living in the school district to determine the number and age of children who will be attending public schools in the future. Of the 46 districts answering this question, 34.8% rely on this method by taking a census of their district. When population in a district is fluctuating rapidly, it may be worthwhile spending the time and money to take a door to door census to ensure that a sufficient number of teachers are available to staff classrooms in future years.

The cohort survival method is similar to class progression, but the number of pupils expected in each grade next year is based on a ratio (survival rate) developed from historical data. Several ratios are developed and a decision is made to use the one for each grade which is most likely to be correct. First grade enrollments are forecasted based on ratios developed from birth records and prior first grade enrollments. Resident births are used to forecast first grade enrollments rather than kindergarten because kindergarten enrollments tend to fluctuate more (Glose, 1977, p. 210). For this reason, kindergarten forecasts are normatively derived and input into the model by decision makers. Several researchers consider the cohort method to be one of the most accurate ways of forecasting enrollments (Glose, 1977; Hopkins & Massy, 1981; Lewis, 1983). Ratios developed by the survival ratio method tend to remain stable (Hopkins & Massy, 1981); however, in the same manner that forecasts become less reliable the further they extend into the future, ratios become less reliable the further they extend into the past.

All school district models are enrollment driven; for example, academic programs (academic planning model), the number of teachers (staffing model) and support personnel (staffing model) depend on the number of pupils to be taught. The salaries and wages paid to these employees comprise the largest segment of the financial planning model.

Because enrollment figures are so important, and because most school districts answering the questionnaire use more than one method of forecasting them, two methods of forecasting enrollments - **cohort and class progression** - are included in the final integrated model developed in this research. Forecasts from the cohort model (which was part of the model developed in Chapter 4) should be compared with results from the class progression method, and the choice of survival rates for forecasting using the cohort method should be adjusted as necessary. The model calculates the average survival rate for each cohort for the previous four years and displays them on an output screen. There is, however, an input screen where the survival rates can be changed to reflect changes in the district which are not reflected in historical data. The enrollment sub model screens are shown as part of the final model at the conclusion of this chapter.

Replies to the questions asked in this research regarding methods of determining enrollments support results of prior research (Glose, 1977) which indicate that most school districts use class progression and historical trends to forecast enrollments. The main objection to the class progression and the cohort method is their over-reliance on historical data. For school districts facing uncertain future enrollments because of special circumstances it is suggested that additional enrollment forecasts be developed using more information from sources outside the schools themselves. For simplicity, figures can be aggregated by elementary, middle school (or junior high school), and high school, or however the district divides student age groups for estimating teacher requirements and building needs. The enrollment forecasts could then indicate minimum, average, and maximum projections for each of the groups (Glose, 1977), and the generic model developed here could be run using each of these forecasts.

It cannot be stated too strongly that school board members and administrators constantly must be aware of external forces which may affect enrollment in their schools. The opening, expanding, or closing of business organizations in or near the school district can cause rapid increases or decreases in enrollment. In districts with large numbers of private or parochial schools, an increase in their fees or a downturn in the local economy may lead to the transfer of large numbers of pupils from private to public school. On the other

hand, an expanding economy, a change in the religious preference of the community, or the opening of new private schools can lead to a loss of pupils.

The literature-based model developed in Chapter 4 included the cohort method of forecasting enrollments. Empirical research shows that currently class progression is most commonly used in responding school districts and that most districts (65.2%) use more than one method. This study recommends forecasting by both class progression and cohort methods as well as any additional information available. The enrollment sub model shown at the conclusion of this chapter generates survival rates as part of a cohort enrollment forecasting model. An additional input screen has been added to the model so that survival rates may be modified as necessary when rates differ significantly from class progression forecasts.

6.3 STAFFING SUB MODEL

The staffing sub model is a critical part of the literature-based integrated financial planning model described in Chapter 4. Inputs into this model are almost all PPVs. These PPVs are curriculum changes which increase or decrease the number of teachers and other employees, teacher/pupil ratios, and current salary and wage schedules. The exogenous variables described in the literature-based model are legal requirements (e.g. state minimum standards for curriculum and salaries), enrollments, and inflation.

Treasurers were asked how often staff planning decisions were made, whether modeling was used, and if modeling was useful for making these decisions (See Figure 6-2).

Fifty-four districts answered this question. Most districts (59.3%) said they make these decisions several times a year. Some (16.7%) make staffing decisions more than once a month. Approximately twenty percent (20.3%) of the districts make these decisions infrequently, and the rest (3.7%) marked "never". Of the 32 (59.3%) districts which use modeling for these decisions, 30 (93.8%) find it useful.

Districts were queried about how teacher requirements are forecasted, and asked to check all of the answers which apply. Forty-seven districts answered this question. The percentages are of the total number of replies.

FIGURE 6-6

METHODS OF FORECASTING NUMBER OF TEACHERS REQUIRED

	No. of replies -----	Percent of replies -----	Percent of Districts -----
Class enrollments	32	40.5	68.1
Teacher/pupil ratio	27	34.2	57.4
Absolute dollar amounts	20	25.3	42.5
Replies to this question	79	100	

No. of districts replying 47

Of the 47 districts which answered this question, more than half (53.2%) use two or more methods of forecasting teacher requirements. The largest number (32) use class enrollments (68.1%). More than half of the districts (57.4%) use teacher/pupil ratios, and 42.5% use absolute dollar amounts. No other methods were mentioned.

It is easy to understand why class enrollments are the preferred method of many school districts since hiring of teachers is primarily dependent on the number of pupils in each primary grade or on the number of students who register for the subjects offered in secondary schools. A teacher's certification determines which grades or subjects each one may teach; therefore, total enrollment and pupil/teacher ratios are guides to the number of teachers desired rather than absolutes. For this reason, both class progression and cohort enrollment forecasting by grades are helpful for forecasting teacher requirements, especially for the first (budget) year of a financial plan when contracts for newly employed teachers are signed.

The staffing model described in Chapter 4 determines the number of teachers needed to reach or maintain the preferred pupil/teacher ratio for the forecasted enrollment each year. This number can be increased or decreased by decision makers, depending on changes in the academic plan which change the number of teachers needed. The staffing model calculates the increase or decrease in number of teachers required by the pupil/teacher ratio and

multiplies it by the average teacher's salary to forecast future personnel costs. Changes in administrative and classified personnel are determined normatively depending on enrollment fluctuations and curriculum changes. The model includes the input of changes in the cost of administrators and/or classified personnel because of the variety of positions for which they are employed.

The empirical work described above suggests that most of the school districts prefer class progression and pupil/teacher ratios for determining the number of teachers required. Because the staffing model allows for these and other changes in numbers of all employees, the generic model shown in Chapter 4 will not be changed as the result of empirical work. Formats for the input and output of the final staffing sub model are shown as part of Figure 6-4 at the conclusion of this chapter.

6.4 FINANCIAL PLANNING SUB MODEL

The financial planning sub model discussed in this section is an essential part of the integrated financial planning model described in Chapter 4. PPVs, exogenous variables, output from the staffing model, and support services feed into the financial planning model. The model may be refined in this section as the result of this original empirical work.

As discussed previously, the financial goal of public school districts is to ensure they remain in operation while providing the kind of educational program the community desires. To achieve this goal, resources must increase at the same rate as expenditures. This seldom occurs, since expenditures tend to rise each year, but there is no longer significant annual growth in resources (see Chapter 2 for details of legislation restricting growth). Substantial increases in local tax rates often depend on a referendum vote, and passing levies is not usually an annual event. Therefore, the increase in resources from passing an operating levy must be large enough to keep the district solvent until the next levy can be passed. Seventeen (39.5%) of the 43 school districts responding to a question about dealing with uncertain futures stated that they maintained a reserve fund to help with this problem (see Figure 6-4). Since school districts in Ohio are on a cash basis, the cash balance at the end of the year reflects any reserve operating funds.

This supports the emphasis on the end of the year cash balance as a prime endogenous output of the financial planning model.

Resources which can be carried over to the following year are also reflected in the ending cash balance each year. If the ending cash balance each year of the financial plan is satisfactory to decision makers, the financial planning exercise is complete. The academic plans and the financial plans are integrated to allow the district to continue operating for future years. If the ending cash balance in any year is not satisfactory, policy decisions can be changed, and the model can be run iteratively.

The purpose of the financial planning sub model is to show the financial effect of policy decisions. A school district financial planning model provides the financial information which school board members and administrators need to have to make policy decisions which affect the district in future years. These decisions relate to goals and objectives, levy and bond issues, academic programs, staffing, salary and wage negotiations, fringe benefits, construction of buildings, support services, equipment purchases, student extracurricular activities, and capital expenditures. The model reflects receipts and expenditures from the general fund only, since the school board determines when to ask for increased resources in the general fund and decides how this money will be spent. Other funds (for example, building and permanent improvement funds) are considered only when expenditures from these special funds replace expenditures from the general fund. Based on the literature (Glose, 1977) and this empirical research, a financial planning model for school districts should also be inexpensive, easy to use, and designed for micro computers.

In Chapter 5 replies to questions about the level of financial planning and budgeting were analyzed. Of the 282 replies (from 265 districts) concerning financial planning, 44.7% show preference for the SM1 (object code) level of aggregation. Almost a third (31.1%) of the replies show aggregation of figures by departments while 16.7% plan by individual schools. Some districts (25.5%) conduct financial planning as well as budgeting by line items. When only districts (59) which have financial models were asked about the number of line items in their financial planning models, replies showed great variations between districts.

FIGURE 6-7
NUMBER OF LINES IN FINANCIAL PLANNING MODELS

	No. of Replies	Number of Lines		Average
		Maximum	Minimum	
Plans run on				
Mainframes	5	1400	26	614
Minis	0	-	-	-
Micros	13	1500	10	252

Mainframes and micros	5	2200	25	725

The maximum and average numbers of lines for models on micros are large; five of the 13 respondents (with micros) answered with 300 or more line items. Unfortunately, only 23 (39%) of the 59 districts which run financial models answered the question, and the replies do not agree with the earlier question (p. 207) asked of all school districts, not just those with computer models. Replies to this earlier question are that 47.5% of the 265 school districts conduct financial planning at the SM1 (Form SM1 contains 24 lines) level which aggregates by object code. Most responding school districts prefer aggregated figures for financial planning and the districts which have computer models do not clearly indicate which level they find most satisfactory. For these reasons, the integrated financial planning model is designed using the State of Ohio Uniform Accounting System object code classifications used for prior school district research (Lee, 1982; Smith, 1985). These classifications aggregate numbers by object of expenditure as does the aggregation used in models designed for colleges and universities (Hopkins & Massy, 1981, p. 134).

Aggregated numbers are more commonly used for financial planning as shown in both this research (47.5% of 265 districts) and in the literature (Pratt, 1985, p. 239), whereas line items are the currently preferred method for budgeting (56.8% of 265 districts) in this research and the literature (Nelson & Purdy, 1974, p. 89).

As stated earlier in this chapter, when school districts using computer models were asked what statistical techniques are employed for forecasting expenses, 44 (84.6%) respondents checked historical trends (e. g., moving average,

percentage of resources). The other eight (15.4%) of the 52 total replies to this question indicate causal (e.g. multiple regression) techniques. These replies correspond to prior research (Glose, 1977) which indicates that most school districts prefer to use simple statistical techniques. The generic model developed in this research uses simple statistical techniques which should be easily understood.

Replies to the question about the statistical techniques preferred by school districts lend support to simple statistical techniques like those used to forecast expenditures in the final financial planning sub model. Because most of these expenditures are PPVs, the percentages and ratios calculated in the model are only guides for decision makers and can be changed by them to reflect policy decisions. The fact that all expenditures in the sub model are PPVs emphasizes the importance of local decisions which determine how resources in the general fund are to be used.

Simple mathematical techniques were used by one Ohio school district which developed a five year financial plan. The plan document describes the ways by which forecasts of various elements of the plan are determined; almost all are based on historical trends or normatively derived dollar amounts. These include enrollment forecasts by grade, classroom needs by building, local tax rates, assessed valuation of property, state foundation funds, and expenditures for the next year (Five Year Plan, 1987).

The plan mentioned above also points out the difficulty of forecasting tax receipts based on forecasts of assessed valuations and tax rates. These two factors form the base upon which taxes are assessed, but the dollar amount to be assessed is the result of the application of complex legislation designed to prevent windfalls to tax recipients (e.g., school districts, cities, counties) when assessed valuations increase (Christman, 1982, pp. 18-19). There does not appear to be any consistent relationship between total assessed real estate valuations and real estate tax receipts, although very large increases or decreases caused by new construction or industries moving in or out of the district can be noted. Personal property taxes are also very dependent on the movement of commercial and industrial organizations (Christman, 1982, pp. 19-20). Glose (1977) states that forecasting revenues by state or local taxes is always difficult, but in the State of New York and some other states, total

revenues are a combination of state and local receipts which are always equal to approved expenditures. In states where income does not automatically equal expenditures (Ohio, for example), tax credits, re-evaluation of property, and movement of industrial plants into and out of the state complicate revenue projections (Christman, 1982, pp. 18-22). The questionnaire sent as part of this research did not ask how school districts forecast their receipts currently, since the literature suggests that even one year projections are uncertain (Christman, 1982, pp. 18-20). Because this subject has not been researched sufficiently and little information is available which suggests how tax receipts can be forecasted, tax receipts will remain normatively determined in the model. In view of the complicated nature of forecasting revenues and the lack of current information, methods of forecasting school district tax receipts could be the subject of a research project.

With the exception of the addition of class progression comparisons with cohort model outputs in the enrollment sub model, no changes to the literature-based financial model presented in Chapter 4 were made to the integrated financial planning model as a result of this empirical work. This is not to suggest that the empirical work was unnecessary. Firstly, few school districts (20.3%) which responded to the survey are currently using computers for financial planning, and those few who have used computer models average only three years' experience. This is probably the reason nothing was found in extant literature which indicated how computerized financial planning is currently being conducted by school districts. Secondly, the survey confirmed the literature-based, normatively derived integrated financial planning model designed specifically for school districts. Thirdly, the survey indicated the interest of school district decision makers in the development of computerized financial planning models.

6.5 FINAL INTEGRATED ACADEMIC AND FINANCIAL PLANNING MODEL

The format of the inputs and outputs of the final integrated academic and financial planning model is shown in Figure 6-8. It consists of the main model and three sub models for enrollments, staff planning, and financial planning. Academic planning is reflected in the PPVs which affect the staff planning sub

model as well as receipts and expenditures in the financial planning sub model.

6.6 SUMMARY

This chapter presents the results of empirical work related to design and use of computerized financial planning models in the State of Ohio. First, replies to questions designed to answer the ones at the end of Chapter 4 about the use of models for decision making, forecasting, and planning are discussed. Then the instigators, operators, and designers are discovered as well as methods used for forecasting enrollments and teacher requirements. Levels of aggregation, type of hardware and software used, and size of models are delineated. As a result of the research reported here, refinements are made to the enrollment forecasting sub model of the generic financial model.

6.7 CONCLUSIONS

The empirical work analyzed and reported in this chapter provides information about how computerized financial planning models are currently designed and used in school districts. It answers the questions asked at the conclusion of Chapter 4. The model described in Chapter 4 is refined to produce a theoretical model based on both the literature and empirical work.

Specifically, the enrollment sub model of the integrated financial planning model retains the cohort method of enrollment forecasting, but the average survival rates calculated by the cohort model may be modified by decision makers when the forecasts generated by those rates differ from class progression forecasts. This change to **two** enrollment methods is the result of the empirical work which showed that most districts use two or more methods to forecast enrollments and that the class progression method is used by more districts than any other method.

The staffing sub model is not changed by the empirical work. The PPVs identified in Chapter 4 reflect the policy decisions which determine the academic plan and the number of teachers needed to achieve the objectives.

According to the empirical research, class enrollments (which are forecasted in the cohort enrollment sub model) and teacher/pupil ratio (which is a PPV) are the preferred methods of determining staffing needs. These two methods are used by most of the responding districts and are incorporated in the model.

No changes were made in the financial planning sub model. The literature suggests that revenues are difficult to forecast (Christman, 1982, pp. 18-22), and empirical work did not include questions about revenues. Therefore, it is not known how school districts currently forecast receipts. In the model, tax receipts (both real and personal property) are determined normatively as exogenous variables. Receipts from the state are also entered into the model as exogenous variables since the district has no control over them (Christman, 1982, p. 21). Ratios determining earnings on investments as compared to previous years' resources are PPVs because they depend on investment and borrowing policies as well as interest rates. Ratios from prior years are calculated from historical data to assist decision makers and are output only as information. Other income is an exogenous variable since tuition income rates are determined by the state.

Fringe benefits are forecasted as a percentage of salaries and wages. Materials, supplies, and purchased services are forecast by growth on prior year's base. Decision makers determine the rate at which expenditures are expected to increase. These forecasts remain the same as discussed in Chapter 4. Capital purchases are determined by dollar amount rather than by percentage increase, and the increase or decrease in other expenses is also a PPV.

The importance of ending cash balances is supported by empirical work since 39.5% of school districts use a reserve fund as one method of dealing with uncertainty. Since all school districts in the State of Ohio are on a cash basis, this reserve is part of the ending cash balance each year.

The integrated academic and financial planning model will be made operational by coding input and output formats (Figure 6-8) using Lotus 1-2-3. The model as presented in this chapter is based on the literature and empirical work and will be tested by school district decision makers in the United States.

Their comments will appear in Chapter 7. The model may be further refined based on those evaluations. The numbers and dollar values in Figure 6-8 are illustrative only and have no particular significance in themselves. Algorithms for these models are shown in Appendix G.

FIGURE 6-8

INTEGRATED ACADEMIC AND FINANCIAL PLANNING MODEL

COHORT SURVIVAL MODEL
HISTORICAL INPUTS

Grade	Enrollment on October 1			
	YR-3	YR-2	YR-1	Curr. Year
Kindergarten	70	70	66	66
Grade 1	60	55	50	48
Grade 2	35	55	52	48
Grade 3	22	30	55	52
Grade 4	21	22	27	52
Grade 5	20	21	21	27
Grade 6	22	20	20	22
Grade 7	23	21	23	23
Grade 8	24	23	24	23
Grade 9	22	24	22	24
Grade 10	22	22	22	23
Grade 11	20	22	20	23
Grade 12	20	20	20	25

Note: Grade 1 enrollments are forecasted by birth rates and prior enrollments. Enter them here.

Year	No. of resident births	1ST GRADE ENROLLMENTS	
		School Year	Enrollment on October 1
9th yr prior-1979	93		
8th yr prior - 1980	92	3rd year prior 1985-1986	60
7th yr prior - 1981	93		
6th yr prior - 1982	94	2nd year prior 1986-1987	55
5th yr prior - 1983	88		
4th yr prior - 1984	82	1st year prior 1987-1988	50
3rd year prior 1985	80		

FIGURE 6-8 CONTINUED

COHORT SURVIVAL MODEL

OUTPUTS: SURVIVAL RATIOS

Average survival ratios, based on the past three years, are shown.

Grade 1	0.59
Grade 2	0.94
Grade 3	0.95
Grade 4	0.95
Grade 5	0.98
Grade 6	1.00
Grade 7	1.08
Grade 8	1.05
Grade 9	0.99
Grade 10	0.99
Grade 11	0.98
Grade 12	1.05

CHANGE survival ratios, if desired. Enter Kindergarten estimates. If no changes are made, ratios shown will be used for forecasting. Make changes by positioning cursor over number to be changed, typing new ratio, and striking "return" or moving to another cell.

Grade 1	0.59		
Grade 2	0.94		
Grade 3	0.95		
Grade 4	0.95		
Grade 5	0.98		
Grade 6	1.00		
Grade 7	1.08		
Grade 8	1.05		
Grade 9	0.99		
Grade 10	0.99		
Grade 11	0.98		
Grade 12	1.05	YR+1	YR+2
Kindergarten enroll estimates		60	55
			55

OUTPUTS: FORECASTED ENROLLMENTS

	YR+1	YR+2	YR+3
Kindergarten	60	55	55
Grade 1	52	49	47
Grade 2	45	49	46
Grade 3	46	43	47
Grade 4	49	43	41
Grade 5	51	49	43
Grade 6	27	51	49
Grade 7	24	29	56
Grade 8	24	25	31
Grade 9	23	24	25
Grade 10	24	22	23
Grade 11	23	23	22
Grade 12	24	24	25
TOTAL			
ENROLLMENT	442	459	481
Kindergarten added @ 50%			

Press "ALT M" for MENU

FIGURE 6-8 CONTINUED

SUMMARY OF STAFF HISTORICAL DATA				Current
INPUT STAFF FINANCIAL DATA				Year
Teachers				\$650,000
Administration				\$200,000

Total Certified Costs				\$1,165,000
Classified				\$220,000

Total Personal Costs				\$1,285,000
Number of teachers				20
INPUT HISTORICAL FINANCIAL DATA - RECEIPTS				
	YR-3	YR-2	YR-1	Current year
Revenue Receipts				(APPROPRIATIONS)
Local				
Real Estate Tax	212,121	1,200,000	1,100,000	1,200,000
Personal Prop Tax	250,000	250,000	250,000	250,000
Investment Income	26,000	10,660	11,290	13,155
Other Local	10,000	10,000	12,000	12,000
State				
Foundation	200,000	200,000	200,000	200,000
Rollback & Homestd	27,576	156,000	143,000	156,000
Other State	37,000	38,000	40,000	40,000
Federal				
Total-Rev Receipts	762,697	1,864,660	1,756,290	1,871,155
INPUT EXPENDITURES				
	YR-3	YR-2	YR-1	Current
Salaries-Cert	600,000	650,000	800,000	830,000
Salary/Wages Class	100,000	100,000	100,000	220,000
Total Salaries & Wages	700,000	750,000	900,000	1,285,000
Fringe Benefits	168,000	180,000	216,000	308,400
Purchased Services	90,000	90,000	90,000	164,000
Materials, Supplies	60,000	60,000	60,000	65,000
Capital Outlay + Buses	35,000	35,000	35,000	35,000
Other (inc. interest)	13,000	14,000	14,500	15,000
Operating-Expenditures	1,066,000	1,129,000	1,315,500	1,872,400
Receipts Over/Under	(303,303)	735,660	440,790	(1,245)
Beginning Balance 7/1	0	(303,303)	432,357	873,147
CASH BALANCE	(303,303)	432,357	873,147	871,902

FIGURE 6-8 CONTINUED

Exogenous Variables				
INPUT	YR + 1	YR + 2	YR + 3	
State Foundation	\$210,000	\$210,000	\$210,000	
Other State Rec.	\$26,000	\$26,000	\$28,000	
Local REAL tax receipts	\$1,100,000	\$1,300,000	\$1,400,000	
(Do not include Rollback and Homestead in these receipts. They will be forecasted as a % of Local REAL taxes)				
	ENTER PERCENT AS A DECIMAL			13%
Local PERS PROP tax receipts	\$230,000	\$240,000	\$220,000	
Other Local Receipts(Inc/Dec)	\$1,000	\$1,500	\$2,000	
INPUT PPVs	***ENTER DOLLAR FIGURES			
STAFFING PPVs	WITHOUT ", "OR".** **ENTER PERCENTS AS DECIMALS***			
Increment/Grad Credit %	3.00%	3.60%	3.50%	
Prfd Pupil/Teacher Ratio	22	21	20	
No. teachers above ratio	0.0	2.0	0.0	
Admin Inc/Dec	\$0	\$25,000	\$0	
Classified Inc/Dec	\$0	\$15,000	\$0	
FINANCIAL PPVs				
New Taxes	\$0	\$0	\$0	
Cert Salary Increase	7.0%	5.0%	5.0%	
Class S&W Increase	7.0%	5.0%	6.0%	
Earnings Rate	1.50%	1.00%	1.00%	
Fringe Benefits % S&W	23.0%	24.0%	24.0%	
Cost of Buses	\$7,000	\$0	\$0	
State pays % buses	75%	0%	0%	
Other Capital Purchases	33,000	50,000	50,000	
Purchased Services	3.0%	3.5%	3.5%	
Materials & Supp.	3.5%	4.0%	4.0%	
Inc/Dec Other Expend. including Interest	\$1,000	\$2,000	\$3,000	

FIGURE 6-8 CONTINUED

STAFFING OUTPUTS			
INCREM-NO GEN INCREASE	YR + 1	YR + 2	YR + 3
Teachers	\$669,500	\$608,027	\$767,839
Administration	206,000	213,416	246,761
Total Certified Costs	875,500	821,443	1,029,600
Classified	226,600	234,758	242,974
Total Personal Costs	1,977,600	1,877,644	2,287,174
No. Teach. BEFORE changes	20	18	21
Average teacher's salary	\$33,475	\$34,680	\$35,834
Enrollment forecast	386	407	429
In/Dec Teach (P/T ratio)	-2.5	1.9	2.1
Total Inc/Dec teachers	-2.5	3.9	2.1
Teachers AFTER changes	18	21	23
Other pers Inc/Dec @ cost	\$0	\$40,000	\$0
Total Inc/Dec Pers cost	(\$82,601)	\$173,846	\$74,470
OTHER HIST. OUTPUTS	YR-3	YR-2	YR-1
Earnings Rate	3.41%	0.57%	0.64%
Fringe Benefit %	24.00%	24.00%	24.00%

OUTPUT - FINANCIAL PLAN - RECEIPTS			
	YR+1	YR+2	YR+3
Revenue Receipts			
Local			
Real Estate Tax	1,100,000	1,300,000	1,400,000
Personal Prop Tax	230,000	240,000	220,000
Investment Income	41,165	26,456	29,036
Other Local	13000	14500	16500
State	5,250	0	0
Foundation	210,000	210,000	210,000
Rollback & Homestd	143,000	169,000	182,000
Other State	31,250	26,000	28,000
Federal			
Total-Rev Receipts	1,773,665	1,985,956	2,085,536
OUTPUT EXPENDITURES	YR+1	YR+2	YR+3
Salaries-Cert	848,402	1,112,002	1,289,398
Salary/Wages Class	242,462	262,245	257,553
Increase	76,360	68,712	79,923
Total Sal & Wages	1,167,224	1,442,959	1,626,874
Fringe Benefits	268,462	346,310	390,450
Purchased Serv	168,920	174,832	180,951
Materials, Supp	67,275	69,966	72,765
Capital OutSame+Busses	40,000	50,000	50,000
Other (inc. interest)	16,000	18,000	21,000
Operating-Expenditures	1,727,881	2,102,068	2,342,039
Receipts Over/Under	45,783	(116,112)	(256,503)
Beginning Balance 7/1	871,902	917,685	801,573
CASH BALANCE	917,685	801,573	545,070

REFERENCES

CHAPTER 6

- Christman, L.H. (1982). *Streamlining local school budgeting in Ohio*. Cleveland, OH: Citizens' Council for Ohio Schools. (ERIC Document Reproduction Service No. Ed 233 457).
- Five year plan 1987 - 1992*. (1987). Unpublished document. North Royalton, OH: North Royalton City Schools.
- Glose, G.P. (1977). A long range financial planning/forecasting model for local school districts. *Dissertation Abstracts International*, (University Microfilms No. AAD78-14000).
- Grafton, C. & Permaloff, A. (1985). Budget implementation with microcomputers. *Public Productivity Review*, 20, 202-212.
- Harris, D.E. (1983). *Representations of a harsh reality: The use of computer planning models in higher education*. Unpublished PhD thesis, Claremont Graduate School.
- Hopkins, D.S.P. & Massy W.F. (1981). *Planning models for colleges and universities*. Stanford, CA: Stanford University Press.
- Jones, K.M. (1984). Implementing optimization in a decision support system. In T.H. Naylor & C. Thomas (Eds.), *Optimization Models for Strategic Planning*. (pp. 169-173). Amsterdam: Elsevier Science.
- Lee, R. (1982). *Financial and staffing ratio analysis: Predicting fiscal distress in school districts*. Unpublished doctoral dissertation, Ohio State University.
- Lewis, J., Jr. (1983). *Long-range and short-range planning for educational administrators*. MA: Allyn and Bacon.

(References continued - Chapter 6)

- Milner, R.G. & Rohrbaugh, J. (1985). Microcomputers and strategic decision making. *Public Productivity Review*, 20, 175-189.
- Nelson D.L. & Purdy, W.M. (1974). *School Business Administration*. Lexington, MA: D.E. Heath.
- Pratt, M.J. (1985). *Computerized support for financial planning in South African universities*. Unpublished doctoral dissertation, University of South Africa.
- Smith, K. (1985). *Forecasting school district fiscal health*. Unpublished doctoral dissertation, Ohio State University.

CHAPTER 7

TESTING THE INTEGRATED FINANCIAL PLANNING MODEL FOR SCHOOL DISTRICTS

7.0 INTRODUCTION

Chapters 2 and 3 survey the literature related to school district organization, financing, planning, financial planning, and financial modeling. The conclusion reached in Chapter 3 is that financial planning models developed specifically to meet school district needs should prove successful in identifying, and perhaps avoiding, potential financial crises in school districts as well as helping with decision making.

The integration of planning, financial planning, and modeling is discussed in Chapter 4, and a normatively derived integrated financial planning model for school districts based on the literature is presented. Original empirical research tests the hypotheses in Chapter 5 and demonstrates the need for this research. The literature-based model is refined by empirical research related to model design in Chapter 6. This chapter describes how the integrated financial planning model was computerized and sent to a small group of school district decision makers in the United States for testing. The comments of the reviewers are cited, and the model consequently is refined based on their recommendations.

The chapter is arranged as follows:

- 7.0 Introduction
- 7.1 Methods of Testing the Model
- 7.2 Computerizing the Model
- 7.3 Analysis of Reviews
- 7.4 Refinement of the Model
- 7.5 Summary
- 7.6 Conclusions

7.1 METHODS OF TESTING THE MODEL

The integrated model for school districts, based on the literature and empirical research, was presented at a seminar in the Department of Accountancy, Massey University, New Zealand, before colleagues who were asked to suggest the most appropriate methods for testing the model for completeness and comprehensiveness. The following suggestions were made: (1) Prove the model in practice. (2) Test with historical data. (3) Attempt to use the model with a local New Zealand school. (4) Ask several United States school districts to examine the model and then make changes based on their feedback. All of the methods for testing suggested at the seminar assumed that the model was operational, however, at that time the model had not been computerized.

A decision was made to follow the last of the suggestions and to test the model in United States school districts. Testing by practitioners appeared to be the best method for determining the validity and completeness of the model. The model would be computerized for the purpose of demonstrating how policy decisions and financial consequences are integrated and to permit easy manipulation of primary planning variables. Copies would be sent to school district treasurers and other people in the United States who would be asked to examine the model for thoroughness and to determine whether or not all primary planning variables are included. It was believed thorough examination of the model for comprehensiveness, completeness, and appropriateness by three or four experts in school district finance would help to ensure the model's usefulness for school districts. Refinements to the model could then be made based on the recommendations of these practitioners.

The model was programmed by the author using Lotus 1-2-3, Version 2. Colleagues familiar with financial modeling offered assistance with the formatting and the designing of macros to access screens and ease data entry. An education administration expert from the United States who was not familiar with the Lotus program pre-tested the computerized prototype before it left New Zealand. She offered valuable suggestions for changing the method of entering data and clarifying the instruction sheets describing how to access and operate the model. The purpose of computerizing the model was not to

design a commercial, "user-friendly" computer program. The purpose was to enable school district decision makers to judge the usefulness of the conceptual model by viewing changes in the cash balances of future years whenever academic policies, and consequently PPVs, are modified. However, the more easily the test model could be accessed and manipulated, the more users could concentrate on examination of the completeness and comprehensiveness of the model itself.

Letters were sent to 14 school district treasurers in the State of Ohio who had stated on the questionnaire that they had Lotus 1-2-3, and they would be willing to evaluate a financial planning model. Answers were received from two treasurers saying they were no longer interested. Another wrote that the district did not have Version 2 of Lotus 1-2-3, and therefore she could not participate in the testing. A disk containing the test model, an instruction sheet for accessing and operating the program, an evaluation form, and a cover letter had already been sent to the treasurers in early December. Copies of the letters, instruction sheet, and evaluation form can be found in Appendix F. Treasurers were asked to test the model and then consider and mark the statements on the evaluation form. Statements on the form refer to the comprehensiveness and completeness of the model. They are discussed in detail later in this chapter. Treasurers were asked to keep the disk and return the evaluation form to the author by January 10, 1989. Additional test disks were sent to six other persons in the United States who are interested in school finances and who could offer comments about the model's usefulness to school districts.

During December two additional letters were received from treasurers expressing great interest in testing the model; one of them contained a change of address. Four of the treasurers were contacted by telephone during the second week in January to remind them about testing the model and to answer any questions they might have. All of the treasurers contacted had received the model (one had changed school districts, but the model was forwarded to him). None of them had yet tested the model, but all of them said they hoped to get around to it soon. One treasurer commented that changing the district's payroll system was his first priority and testing the model was much further

down on his list of things to do. The other three cited lack of time to examine the model, although one said he expected to look at the model that evening.

By the first week in February three completed evaluation forms had been returned by treasurers. Two of the treasurers identified themselves and their school district by signing the evaluation form, although no identification was asked for or expected. One treasurer included a copy of his district's five year financial plan for both operating and capital expenditures. No other evaluation forms were received from the remaining eight treasurers. Since one of the completed evaluations was anonymous, the eight who did not test the model remain unidentified also, although judging from the postmark on the return envelope, the treasurer who tested the model was probably not one of those who were contacted by telephone.

Letters were received from two of the other six persons to whom test disks were sent. One person wrote that she has no micro computer in her office and consequently could not test the model. The other letter contained many useful comments which are included in the analysis of reviews. Oral remarks were received from two of the other persons who examined the model.

In summary, an educational administrator pre-tested the computerization of the model, three treasurers tested the model, completed the evaluation form, and offered suggestions for improving the model. Three other persons in the United States who are familiar with school district financing offered written or oral comments about the model. The comments from these six persons about the comprehensiveness, completeness, and usefulness of the model are discussed in detail below.

7.2 COMPUTERIZING THE MODEL

The model was computerized on an MCS Personal Computer (an IBM clone) using Lotus 1-2-3, Version 2. When the Lotus program is activated, the model can be retrieved from the disk and shown on the screen by using the slash (/), format (F), retrieve (R) commands and pressing the "Return" or "Enter" key. The model includes macros which access all screens from the "MENU" or, on

some screens, by using the "PgDn" key. The menu can be reached at any time from any place on the worksheet by holding down the "Alt" key and pressing "M". This information appears on all screens. Macros are included to save, print, or quit the test model. Print outs of the model's screens as they appear on the computer's display monitor are shown in Appendix G. The formulae for calculating outputs are shown on the appropriate screens.

Three input screens are designed for the enrollment sub model. Enrollment figures to be entered are those for October 1 of each year. The first input screen is for entering birth rates for the past nine years and first grade enrollments for the past three years and the current year. The second screen is for entering enrollment figures for all other grades for the past three years and the current year. The third input screen allows changes to be made in the calculated survival rates which are based on the historical data. Estimates of kindergarten enrollments for the next three years are also entered on this screen. The two output screens for enrollments are for (1) average survival rates for first grade based on birth rates and for all other grades based on historical data and (2) forecasted enrollments for the next three years.

There is one input screen for exogenous variables, and three additional input screens for historical financial data. The first screen for historical data is for entering personnel salary and wage information in summary form. (If payroll data are recorded in a program which is compatible with Lotus 1-2-3, the model can be altered to import these data.) The next two input screens for historical data are for entering aggregated receipts and expenditures for the past three years and the current year. These figures are used to calculate investment earnings ratios and fringe benefit ratios to guide decision makers in addition to providing base figures for growth based on percentages. These screens can be printed by activating the proper print command to enable decision makers to compare forecasts with historical data if they so desire.

The remaining input screen is the heart of the model. It lists all of the PPVs for the following three years. As these PPVs are entered, the model calculates the cost of implementing the policy decisions which determine the PPVs. When the model was computerized a PPV was found to be missing. It was added to the model as an increase or decrease in "Other" expenses. This

category of expense includes payments for the financial services for state and county auditors and treasurers and other expenses. Some of these costs are based on total receipts and can be forecasted. However, this item also includes interest payments and other expenses which cannot be forecasted (e.g., state audit fees and legal fees which vary considerably from year to year). Therefore, decision makers are asked to input increases or decreases to the prior year's expenditure.

There are four output screens in addition to those for enrollments. The first shows staffing information for the next three years as well as historical investment earnings and fringe benefit ratios. This information may be of interest to decision makers as they manipulate the PPVs. The second output screen contains a summary of three important outputs for each of the forecasted years - (1) cash balance, (2) total forecasted receipts, and (3) total forecasted expenditures. The other two output screens are aggregated receipts and expenditures for the three forecasted years in the same format as the historical data. These latter two screens can be printed using the designated print command.

The model performed well when computerized by the author. Sample historical information was entered, and normative forecasts were made for exogenous variables. For the enrollment model, average survival rates were used to forecast enrollments for three years. PPVs were varied, and outputs changed accordingly. The sample figures were retained in the test model for the use of examiners who might prefer to use it for reviewing purposes instead of assembling data from their own district.

The test model was designed to be operated by persons with a limited amount of computer expertise and was pre-tested by persons not familiar with the Lotus program. Treasurers should be able to access and use the test model easily by following the detailed instructions sent to them with the disk. An evaluation form was developed to encourage all reviewers to look at how well or poorly the model fulfills its purpose of integrating academic and financial planning in an inexpensive and easy to use model. Copies of the instructions and evaluation form are in Appendix F.

7.3 ANALYSIS OF REVIEWS

Evaluation forms were sent to all reviewers with the test models to direct their consideration of the model to its usefulness, completeness, and comprehensiveness. The form consisted of thirteen statements. Each of the statements was worded positively, and reviewers were asked to indicate on a five point scale the extent to which they agreed or disagreed with the statement and to offer additional comments or suggestions for additions or improvements. In the following paragraphs, each of the statements is quoted or summarized. Comments following each of the items include suggestions from all of the reviewers whether they completed the evaluation form or not. Following comments about the statements are the changes which were made in the final integrated model as the result of suggestions from reviewers.

The first statement on the evaluation form is, "The purpose of the model is to help decision makers with long range financial planning. **The model fulfills this purpose**". All of the treasurers and other evaluators agreed that the model fulfills the purpose for which it is designed and can help school district decision makers with long range financial planning.

The second statement says, "The primary planning variables (PPVs) **reflect adequately the policy decisions** which must be made by the school board and administration". Opinions were divided about whether or not the PPVs adequately reflect policy decisions. One treasurer detected personnel policy decisions which he felt were not adequately reflected in the model. As a result of his comments, an additional PPV has been added to the model. A full discussion of his comments and the subsequent change in the model are discussed following statement 4.

Statement 3 is as follows, "Varying the primary planning variables (PPVs) and observing future cash balances in this model helps decision makers (school board and/or administrators) to **understand the financial implications of curriculum and staffing decisions**". The concept of the model as a tool to help decision makers understand the financial implication of academic decisions was strongly supported by all of the evaluators. This statement

received more favorable comments than any of the others and emphasizes the usefulness of integrating academic and financial plans.

Statement 4 is about the inclusion of all the primary planning variables (PPVs) and asks that any missing variables be listed. The statement reads, "All of the necessary **primary planning variables (PPVs) are included** in the model". One treasurer suggested that the following items might be classified as PPVs in order to more fully reflect policy decisions (see statement 2): personnel costs such as substitute teachers, severance pay, supplemental contracts, and benefits such as early retirement incentive programs. All of the personnel costs listed above were included in the model as part of the current cost of personnel already employed, but no provision was made for changes in these amounts as the result of policy decisions. Therefore, a PPV for "Other personnel costs" will be added to the model. This will accommodate increases or decreases in current personnel costs other than changes in the number and cost of persons employed. The addition of this PPV will also facilitate showing the cost in future years of early retirement incentive programs. An additional use for this PPV was offered by an educational administrator who commented that adding this PPV would accommodate school districts which operate merit pay systems.

Statement 5 states that the model includes all **other necessary information** for long range financial planning. Several suggestions were offered by reviewers for additional information which might be included in the model. One treasurer suggested expanding the model to include separation of certified personnel by function (e. g., instruction, vocational, special education, federal programs; the full list of State of Ohio school district accounting object and function codes is presented in Chapter 2, Section 2.9.1). This treasurer's school district projects salaries and wages of individual employees which are then sub-totaled by function. Possible additions of staff to each of the various functions are then calculated, and the total salary and wage package is forecasted. This kind of detailed information is necessary for budgeting purposes but including PPVs for each of the functions every year of the financial plan to provide for yearly changes in each function would make the process cumbersome for long range financial planning. Too much attention to detail and too many PPVs curtails the ability of decision makers to concentrate

on the long term effect of decisions to increase or decrease personnel or the effect of alternative wage base increases. Primary advantages for decision makers of the model developed in this research are (1) the flexibility to change policy decisions each year as reflected in PPVs, (2) the opportunity to observe and consider alternative, "what if" scenarios in a (3) timely manner. Therefore, expenditures will continue to be based on the object of expenditure rather than detailed by function.

Additional revenue information was suggested by one treasurer. He would prefer to see yearly calculations of tax revenues based on projected valuations of taxable property. This particular district projects the assessed valuation of each type of property based on ten years of historical data showing value and percentage increase for each classification. These data are used as the example of valuation fluctuations in Figure 4-4, p. 122. Although Figure 4-4 demonstrates that random factors affect the increase and decrease of various classes of property, this particular district assumes that the tax base (assessed valuations) will continue to grow at a steady rate annually with a larger rate of growth in update and reappraisal years. Assumptions are made that property taxes will be collected at current rates adjusted for reduction factors when applicable. State foundation increases are assumed for both basic aid and categorical funding (the district is on a "guarantee" that they will not receive less than the prior year until the formula is changed). Other revenue is increased consistent with enrollment or presumed inflation. The revenue projections used by this district are detailed and require many assumptions. They may be helpful to indicate historical trends for districts which have the time and expertise to use them. However, since lack of time, money and expertise to develop financial models have been shown to be the major barriers to school district financial planning, and because historical tax receipts adjusted for inward and outward movement of large industries have been shown to be the best indicators of changes in tax receipts in prior years, for the purposes of the model developed here revenue forecasts will continue to be judgmentally derived.

A former school district superintendent now working with the Ohio School Boards Association stated that the revenue forecasts seemed to work well in the model, but he suggested that property valuation should be included in

historical data, presumably for information purposes and to identify trends. This information is readily available in school districts and can be reviewed for historical trends before forecasting tax receipts. It is likely, however, that total tax receipts in past years, rather than receipts from specific types of property, will be most useful when forecasting future tax receipts.

Tax receipts for the integrated model will continue to be determined judgmentally after consultation with county auditors, and state foundation receipts will be increased from the amount received the previous year only when state board of education officials give a clear signal that projected increases are likely to be funded by the legislature. The author recognizes that detailed revenue forecasts would add credibility to financial planning if they were more accurate than judgmentally derived forecasts. In the State of Ohio, however, all of the factors which determine tax receipts and state receipts are out of the control of school district decision makers, are highly political, and can be changed by the state legislature or state board of education at any time. They do not, therefore, lend themselves to statistical forecasting. The only revenues which are PPVs are additional tax levies which school boards can place on the ballot for a vote and some minor sources of local receipts such as rents and fees.

The next statement on the evaluation form is, "The information asked for in the model can be assembled **quickly and inexpensively**". The purpose of this question is to determine if this computerized version of the model meets the needs of those school districts that expressed a lack of money and expertise were reasons for not implementing computerized financial planning. All of the reviewers agree that the information asked for in the model can be assembled quickly and inexpensively. Much of the historical data can be found on fourth quarter cash flow (SM2) statements.

The next two statements will be discussed together since both deal with using the model for communication purposes. The first reads, "The model can be helpful for **communicating financial information** to board members". The second states, "The model can help **communicate financial information** to the community and/or staff". Although the reviewers agree that the model can help to communicate financial information to the school board (Statement 7),

they are divided about the model's ability to help communicate information to the community and/or staff. Since school districts in many states are not legally required to prepare financial plans, some districts may prefer to keep their long range planning "in house" until negotiated agreements for salaries and wages are complete. However, other districts may use financial plans to show the community the need for additional revenue to maintain or expand programs or to cope with increased enrollments. One education administrator stated that although school district administrators might use financial models to communicate financial information to the school board, they often felt no need to communicate financial information to staff members.

One statement on the evaluation form was designed to solicit the reviewers' assessment of the flexibility of the model by stating, "The model is **flexible** enough to be functional in most school districts". The reviewers agree that the model is flexible enough to be functional in most school districts. One treasurer who is from a large school district stated that the model could, with some of the refinements he suggested, be very useful to small and medium size school districts. (As stated above, no identification was asked for or expected on the evaluation form, but this treasurer signed his form and included copies of his district's financial plan with the evaluation form.) He commented, however, that large districts which already conduct financial planning using both mainframes and micro computers (as his district does) are unlikely to change to a model similar to the one developed in this research.

One statement testing the usefulness of the model says that "School districts which implement the model will be more likely to **understand their financial future** than those which do not implement it". All of the evaluators agree that school districts which implement the model will be more likely to understand their financial future than those which do not implement it. In other words, the model fulfills its purpose of integrating academic and financial plans over the long term in order that decision makers might avoid financial disasters which could interrupt the educational process.

The next statement is related to the ease of using the computerized version of the test model rather than to its conceptual completeness. Reviewers were asked to indicate whether the test model was difficult to access or operate by

checking the statement "The model can be used with a **minimum of computer experience**". There is a difference of opinion among reviewers as to whether or not the test model can be operated successfully with a minimum of computer experience, although none of them disagreed with the statement as given. Interestingly, the treasurer who agreed most strongly with this statement also agreed more strongly with all of the evaluation statements than others who experienced problems operating the computer model. It is possible that difficulties experienced by reviewers when accessing or operating the computerized test model could affect their decisions about the conceptual model's acceptability. One of the reviewers with limited computer experience found the test model very easy to use and thought the instruction sheet was quite adequate. Others might have preferred a more "user friendly" model which would allow the operator to concentrate on the purpose and significance of the model, rather than its operation. However, the purpose of computerizing the test model was to show how academic decisions can be integrated with financial plans within the model to show financial consequences over the long term, not to design a commercial product. If this model or a similar one is to be used widely by school districts, a more sophisticated program and a comprehensive user's manual are likely to be needed.

Another statement asked whether all of the **information needed for financial planning was included** in the primary planning variables. Although reviewers gave the model high marks in this area, some of the reviewers listed areas of the model which could be improved in addition to those already mentioned above. One treasurer suggested adding income tax as a local source of revenue for the following reason. For a limited time during the 1970s school districts in Ohio could institute local income taxes as an additional revenue source. Although it is no longer permissible for school districts to impose this type of tax, a few districts are still collecting local income taxes. This category of revenue may also be collected by school districts in other states, and will, therefore, be added to the model. It will be included as an exogenous variable since school districts cannot control the amount of income tax to be collected. Income taxes will also be listed as an additional receipt item in the financial plan expenditure output.

Although the test model included PPVs for entering desired pupil/teacher ratios for each forecast year, one treasurer suggested expanding the number

of these ratios because the state mandates for staffing are different at each grade level (elementary, junior high, high school). This change would require that some teachers be divided into separate groups according to the grade level at which they teach. Special education, vocational teachers, and others would have to have additional categories. Primary planning variables would be required for each of these segments each planning year. It was considered this additional detail in a financial planning program tends to draw attention away from the main purpose of the model which proposes to integrate the total academic plan with the financial consequences over the long term. In addition, none of the respondents to the questionnaire stated that they currently use more than one ratio for forecasting staffing needs. Different pupil/teacher ratios should be examined when annual budgets are prepared, but the final model will not be expanded to include additional pupil/teacher ratios.

A suggestion was made that borrowing for cash flow purposes over the year end should be a separate category. Earlier in this dissertation it was suggested that these funds not be entered into the model since they inflate both receipts and expenditures, making comparisons with prior and future years difficult. If a district prefers to enter these amounts, borrowings can be included with other income and repayments can be entered as other expenses.

The final statement on the evaluation form was to find out whether or not reviewers were interested in implementing the model, or one similar to it, for their own school district. They were asked to consider the following statement, "I would recommend that my district take steps to **implement this model** or a similar one within the next year. If not, state why not". One treasurer stated that his district has its own detailed mainframe and micro financial planning system which is working very well. He did, however, suggest that the model could be helpful for other small or medium sized districts. Another treasurer is enthusiastic about the model, whereas the third is unsure. The other reviewers did not answer the question, possibly because they are not in a position to offer such a recommendation.

In summary, reviewers were most enthusiastic about the model's ability to help school district decision makers understand the financial implications of curriculum and staffing decisions. They also strongly agree that school districts which implement the model will be more likely to understand their

financial future than those which do not implement it and that the information asked for can be assembled quickly and inexpensively. They agree that the model is useful for communicating information to boards members and for helping board members with financial planning. In addition, they agree that the model is flexible, requires a minimum of computer experience, and includes the information needed for financial planning. Reviewers offered suggestions for including more PPVs in order to reflect more adequately policy decisions, and they recommended the inclusion of an additional revenue item to increase the information necessary for long range financial planning. The aspect of the model which reviewers stated was least effective was using the model to communicate financial information to the community and/or staff. Overall, the model was perceived by reviewers as complete and useful to school districts.

7.4 REFINEMENT OF THE MODEL

The following changes have been made to the model as the result of testing and reviewing by practitioners.

1. A primary planning variable called "Other Personnel Costs" has been added to the model. This will accommodate increases or decreases in personnel costs such as supplemental contracts. It also can be used to show the costs of early retirement incentive programs or merit pay.
2. An exogenous variable shown in the model as "Income Tax Receipts" has been added to accommodate those districts which took advantage of this additional source of income during the time when it was legally possible to do so in the State of Ohio.

7.5 SUMMARY

The conclusion was reached that the best way to assess the model was by making it operational and sending copies to United States school district treasurers and other persons interested in school finance. The model was programmed using Lotus 1-2-3, Version 2. Instructions for operating the test model were included with the disk. An evaluation form consisting of positive statements and a five point scale indicating agreement/disagreement was sent

with the test model to school district treasurers and other interested people in the State of Ohio. Reviewers agreed that the model fulfills its purpose adequately. Included in remarks following the statements are specific comments and suggestions of individuals who assessed the model. Changes made to the model as the result of the testing process are listed.

7.6 CONCLUSIONS

Field testing and refinement of the model based on evaluations by school district decision makers in the United States indicates that

1. the model helps decision makers with long range financial planning, thus fulfilling its purpose;
2. primary planning variables (PPVs) reflect adequately the policy decisions which must be made by school boards and administrators, and all necessary PPVs are included in the final model;
3. the model includes all other necessary information for long range financial planning, and the information asked for can be assembled quickly and inexpensively;
4. the model helps school district decision makers to understand the financial implications of curriculum and staffing decisions;
5. the model can be more helpful for communicating financial information to board members than for communicating such information to the community and/or staff;
6. the model is flexible enough to be functional in most small or medium size school districts, and can be operated by persons with a minimum of computer experience;
7. school districts which implement the model will be more likely to understand their financial future than those which do not implement it.

Testing by practitioners in the United States and subsequent refinement of the model according to their recommendations indicate that the model is complete and comprehensive. Reviewers of the model agree that the model can be useful to school district decision makers for understanding the financial consequences of academic decisions and for decision making. They also

agree that school districts which implement the model are more likely to understand the financial future of their district than districts which do not implement it. Therefore, the model can be considered to be capable of fulfilling its purpose of assisting school district decision makers with financial planning and decision making. Print outs of the computer screens of the model as they appear after the changes recommended by testing are in Appendix G. Algorithms are displayed when applicable.

CHAPTER 8

GUIDELINES FOR IMPLEMENTING THE COMPUTERIZED FINANCIAL PLANNING MODEL

8.0 INTRODUCTION

The organization, funding and specific financial issues of school districts are examined in Chapter 2. Chapter 3 surveys literature related to planning in general and financial planning in particular and established a theoretical base for financial planning and modeling in school districts. The conclusion reached is that financial planning models developed specifically to meet school district needs could prove successful for identifying, and perhaps avoiding, financial crises in school districts and may help with decision making. Chapter 4 presents a normative literature-based model for school districts which integrated academic and financial planning. Chapter 5 states the hypotheses of the research and analyzed original relevant empirical work to test them. Additional original empirical research is analyzed in Chapter 6 and used to refine the earlier model. Then the final generic resource allocation financial forecasting model is described. The model was computerized for testing, and the comments of reviewers are stated in Chapter 7. This chapter presents guidelines for school districts wanting to implement the computerized integrated financial planning model.

The chapter is arranged as follows:

- 8.0 Introduction
- 8.1 The Planning Schedule
- 8.2 Entering Data into the Model
- 8.3 Inputs to the Model
 - 8.3.1 Birth Records and Past First Grade Enrollments
 - 8.3.2 Survival Ratios
 - 8.3.3 Personnel Data and Historical Receipts and Expenditures
 - 8.3.4 Other Exogenous (External) Variables
 - 8.3.5 Primary Planning Variables (PPVs)

- 8.3.6 Summary of Important Outputs
- 8.3.7 Changing Policy Decisions
- 8.4 Outputs of the Model
- 8.5 Summary
- 8.6 Conclusions

8.1 THE PLANNING SCHEDULE

It was shown in Chapter 3 that an effective long range academic plan should be integrated with financial planning to provide adequate resources to carry out goals and objectives of organizations. To obtain the best results when operating the computerized model described in Chapter 7, a planning procedure is recommended. This planning schedule suggests that school district administrators and school board members work together to prepare for operating the computerized planning model so as to increase understanding of the principle of integrating academic and financial planning. School district treasurers who tested the model agreed that most of the information required is easily available in school districts, and the model is not complicated to operate.

Planning begins with a determination of what is to be accomplished (output) by the planning process so the necessary background information (input) can be assembled to support decision making (input). Assigning responsibility for collecting the necessary inputs of the process to individuals and/or groups, and setting a specific time for presentation of information or completion of segments of the project, will enhance the process. The following schedule is suggested as one way to implement integrated long range financial planning in conjunction with the model. Mutually agreed upon deadlines for completing collection of the necessary information might enhance performance.

PROJECT	RESPONSIBLE FOR COMPLETION

STAGE 1	
Formulate (or review & revise) mission statement and goals and objectives.	Board and Superintendent

Gather birth records (prior 8 years and current year). Personnel Dept.

Gather historical data for three fiscal years and current year for

Enrollments. Personnel Dept.

Employee contracts and records. (Download from mainframe, if possible). Summarize data. Personnel or Data Processing

Cost of academic programs - when available. Data Processing

Resources & expenditures. Treasurer

Auditors' estimated tax receipts, assessed valuations and tax rates. Treasurer

Input enrollment data, change survival rates if necessary, and forecast other exogenous variables. Treasurer

Estimate staffing needs and other costs of objectives (e.g., books, equipment). Personnel Dept. and Treasurer

STAGE 2

Review process to date and prioritize objectives. Board and Administration

Analyze programs using SWOT, SWOP, and/or GAP Analysis. Board and Administration

Update academic plans. Administration/ Board Approval

Determine strategies to achieve objectives. Administration

Enter staff requirements and other PPVs iteratively until cash balances are satisfactory. Administration

Present integrated academic and financial plan to school board. (Repeat STAGE 2 until board approves plans.) Superintendent

Publish academic and financial plans after school board approval. Treasurer

Prepare annual budget, appropriations, and monthly cash flow to coordinate with first year of financial plan.	Treasurer and Administration
Update historical data at close of fiscal year.	Treasurer

Financial planning is meant to be an ongoing process. As each fiscal year closes, the model should be expanded to include yet another year into the future. While the final computerized model developed in this research forecasts for three years, it can easily be changed to add additional years. For example, when a three or five year emergency levy is planned, the financial planning model should be expanded to show the effect of the levy for each year it will be collected. Expanding the time horizon is particularly necessary when an emergency levy is anticipated for the second or third year of a financial plan.

8.2 ENTERING DATA INTO THE MODEL

Specific instructions for accessing the model and entering data are as follows. The model is designed to be used with Lotus 1-2-3, Version 2. When the worksheet appears on the screen, place the model disk in the "A" drive and close the drive door.

Retrieve the model from the disk to the screen by typing **"/FR"**. Then press the **Return** (or **Enter**) key. The title page will appear.

The MENU can be reached from the title page by pressing "PgDn" (on the right hand side of the keyboard), or by (1) holding down the "Alt" key (on the left hand side of the keyboard) and (2) depressing the "M" key at the same time. The MENU lists all of the screens which can be accessed by holding down the "Alt" key and the letter listed beside the title of the screen.

The MENU can be reached from any part of the model at any time by typing "Alt M" in this manner. **IF ALL ELSE FAILS, PRESS THE "Esc" KEY (Right hand side of keyboard) 6 TIMES--THEN "Alt M" FOR MENU.**

Numbers can be entered only in cells which are highlighted (more about this in the next paragraph). To enter numbers, (1) place the blinking cursor in the proper position by using the arrow keys at the right of the keyboard, (2) enter (type) the proper figures using the numbers on the top row of the keyboard. Then (3) move the cursor to the next position. If you make an error, press "Return" and type correct figure. When you press "Return" again, the correct figure will appear in the cell. Do not use a "\$", comma, period, or blank space when entering a dollar amount. Enter percents as decimals; for example, enter twelve percent as ".12". It will appear on the screen as a percent when entered in this way. (Totals may be in error by one digit as the result of rounding.)

Input areas are highlighted. If you cannot see the highlighted areas on an input screen, adjust the knobs on the front or side of your monitor. If you try to enter data any place except an input cell, the machine will display "Error" on the top right hand corner of your screen and will not accept the data. Depress the "Esc" key, and the "Ready" sign will reappear. Sample figures are entered into the test model to serve as examples.

Remember, when dollar amounts are to be entered into the model, it is important not to enter dollar signs (\$), commas (,), or decimal points (.). For example, "\$4,500" should be entered as "4500". When percents are to be entered into the model, they must be entered in their decimal form. For example, "5.5%" should be entered as ".055". The dollar amount or percent may appear on the screen differently from the way it was typed.

8.3 INPUTS TO THE MODEL

While it is not absolutely necessary to input information into the computerized model in any particular order, the following system of entering data is recommended so that information generated by the model will be available when needed (e.g., enrollment forecasts, prior years' investment earnings, fringe benefit ratios). Following this list of inputs, each item will be discussed in detail.

1. Enter resident birth records and enrollments for past and current years.

2. Compare enrollment forecasts with class progression forecasts and adjust survival ratios to produce the most likely forecasts. Use information from any source which indicates important changes in future enrollments.
3. Enter current personnel salary data and historical receipts and expenditures. Enter personnel data in summary form. The model may be altered to import personnel data in summary form from other Lotus 1-2-3 files. Historical receipts and expenditures can be taken from fourth quarter SM2 (object code) cash flow reports.
4. Enter exogenous variables after consultation with county auditor and state board of education officials. While it is impossible to forecast tax revenues with mathematical techniques, past history can be helpful if the district's assessed valuation is not expected to change dramatically in the near future. Unless information from the state board of education indicates large increases or decreases in state foundation funds, the previous year's receipts should be used as a guide to future receipts.
5. Enter the primary planning variables (PPVs) which best reflect the academic plan and the strategies for reaching objectives. PPVs are the heart of the model and reflect those academic decisions which have financial consequences. (Examine the screen with Staffing and Other Outputs for guidance when forecasting investment earnings and fringe benefit ratios.)
6. Examine the Summary of Important Outputs to determine if cash balances for the forecasted future are satisfactory (sufficient to finance the academic plan and keep the district in operation).
7. Change policy decisions (restrict academic or other programs or determine to seek additional resources) and input PPVs which reflect these changes.

8.3.1 BIRTH RECORDS AND PAST FIRST GRADE ENROLLMENTS

Birth records for the past nine years should include all resident births. This information should come from the county recorders. (Births in the State of Ohio are entered into official records according to the mother's place of residence, not the actual place of the child's birth.) All enrollments, past and current, should be entered as of October 1.

8.3.2 SURVIVAL RATIOS

The average of the past three years' survival ratios is calculated within the model, and forecasts for the next three years are forecasted based on these

ratios. The enrollment forecasts should be compared with class progression enrollment forecasts. Then survival ratios should be modified to reflect the most likely enrollments based on the cohort survival forecasts, the class progression forecasts, and any other information which is available. Because of the importance of enrollment forecasts to all academic and financial plans, it is recommended that the entire integrated model be operated using maximum, minimum, and average forecasted enrollments whenever a school district is undergoing rapid population changes.

8.3.3 PERSONNEL DATA AND HISTORICAL RECEIPTS AND EXPENDITURES

Enter personnel data in summary form. However, if payroll information is recorded in a format which is compatible with Lotus 1-2-3, the model can be coded to import data directly from those records. The test model was not equipped with this facility, but it can be added easily by persons familiar with the Lotus program.

8.3.4 OTHER EXOGENOUS (EXTERNAL) VARIABLES

Exogenous variables are those external uncertainties which affect school districts but are not under the control of school district decision makers. This model does not forecast all exogenous variables mathematically. Variables which are forecasted within the model are enrollments for three years based on survival ratios (see above). Other exogenous variables which are a part of this model do not lend themselves to mathematical calculations and must be normatively derived. That is, the best possible forecasts must be determined from the information available. Exogenous variables which are normatively derived are (1) forecasted real estate and personal property tax receipts which should include increases anticipated from levies which have already passed. Only real estate and personal property tax receipts which are expected to be collected locally should be forecasted as local tax receipts. Rollback and homestead receipts from the state (which are reimbursements for state credits and exemptions which have been deducted from local taxes) are calculated within the model as a percentage of the estimated total tax receipts collected locally. Tax receipts are divided in this manner since that is the method used for SM1 and SM2 cash flow reports, and historical data may be easily compared with forecasts. County auditors should be asked to examine forecasted tax receipts for reasonableness. Other exogenous variables which

are normatively derived are (2) future state foundation and other state receipts. Future receipts from the state for foundation and categorical funds are sometimes protected by guarantees that receipts the following year will be no less than the amount received during the current year. Under those circumstances, forecasted state receipts each year can be entered at the same amount as the previous year unless better information is available. The state board of education is, perhaps, the best place to find out if forecasted state receipts are reasonable. This is also the best place to learn if the state legislature has totally funded the state foundation formulae. (3) Historical data can be examined to determine the percentage of local tax receipts which have been received from the state in past years as reimbursement for rollbacks of local taxes and homestead exemptions for the elderly. This percentage is likely to remain the same for future years unless there are major changes in the population of the district. Remember to enter all percentages in the model as decimals (e.g., .13) although they will appear on the screen as percentages (e.g., 13%). Those districts which collect local income taxes should enter in the appropriate place the amount which they expect to receive each year.

Earlier in this study it was recommended that the model might be operated using different variations of exogenous factors when they are particularly difficult to forecast. For example, different enrollments could be input when a district's population is very uncertain for any reason (e.g. opening or closing of a large industrial organization in or near the district) to see just what the financial effect of large swings in enrollment will have on academic and financial plans. Another recommendation made previously is that different forecasted tax receipts be used for districts which have levies on the ballot for referendum voting since no election is certain until the votes are counted. School districts are urged to consider both of these recommendations.

Forecasts are kept comparable with historical data by excluding short term loans from the model; therefore, neither anticipated receipt of borrowed funds nor the amount deducted from taxes and placed in the bond retirement fund for repayment need be shown for planning purposes. Interest on short term loans is, of course, an expenditure. When long term notes are sold in anticipation of tax receipts, receipt of the funds should be shown under other income. Deductions from general fund tax receipts for repayment are reflected in lower receipts automatically. (If decision makers want the general fund to show the

interest expense of long term borrowings, both the expenditure and the receipt of repayment funds may be entered in the model under other receipts and other expenditures, although the actual transactions will be made through the bond retirement fund.)

8.3.5 PRIMARY PLANNING VARIABLES (PPVs)

After all historical and exogenous variables are in the model, then PPVs which best reflect policy decisions should be entered. The following PPVs have been identified in Chapters 4, 6, and 7.

PPVs -----	Input -----
Annual salary increments, graduate credit, wage steps	Percentage increase based on historical data
Pupil/Teacher ratios	Desired number of pupils per teacher
Number of teachers	Increase or decrease in number other than enrollment changes which are calculated
Number of administrators	Increase or decrease in salaries because of change in number employed
Non-teaching personnel	Increase or decrease in salaries and wages because of change in number employed
Projected salary and wage rate increases for certified and classified employees	Negotiated or anticipated general increases on base salaries and wages
Fringe benefits	Ratio of total personnel costs benefits (e.g., retirement, insurances)
Other personnel costs such as supplementary contracts, substitutes, and early retirement incentive program (ERIP) costs in appropriate years	Increases or decreases in these contracts other than those reflected in salary increases. Total cost of ERIP
Purchased services, materials and supplies, capital purchases	Choice of growth, inflation, or other rate of increase on previous year's expenditure

Purchase of buses and percentage of state reimbursement	Estimated cost and percentage of reimbursement by state
Other expenses	Auditors' and treasurers' fees; interest; other expenses
New tax levies	Dollars to be collected each year after levies pass
Investment earnings	Forecasted ratio based on prior year's receipts
Other local income	Forecasted ratio (inflation or other percentage)

Decision makers should examine the screen with staffing and other outputs for guidance when forecasting investment earnings and fringe benefit ratios. For other local income the percentage increase or decrease can be the current or anticipated rates of inflation, or could reflect an expected decrease from loss of tuition (rates set by the state) or rental income (from unneeded buildings or equipment). PPVs are the heart of the model, and decision makers may want to try many different combinations of PPVs to examine the effect on cash balances.

8.3.6 SUMMARY OF IMPORTANT OUTPUTS

This screen shows the cash balances that will be the result of forecasted resources being used to carry out the policy decisions which determined the PPVs. In other words, the cash balances shown are the difference between forecasted receipts and expenditures which are allocated according to the primary planning variables (PPVs). Also shown on this screen are total receipts and total expenditures, figures which may be important to decision makers as they manipulate PPVs.

While this computerized model is developed specifically for integrated academic and financial planning, it can be operated as well during negotiations with unions to determine what the effect of various salary and wage packages will be on cash balances of future years.

8.3.7 CHANGING POLICY DECISIONS

When all of the information and primary planning variables (PPVs) have been entered into the model and the cash balances have been examined, if the cash

balances are satisfactory (sufficient to finance the academic plan and keep the district in operation) to decision makers, the academic and financial planning process is complete. The financial resources are sufficient to support the academic plan over the long term.

If decision makers are not satisfied with any or all of the cash balances, they may move back to the PPV input screen and vary the PPVs until cash balances are satisfactory. One of the benefits of long range financial planning is the ability of decision makers to adjust programs gradually, to eliminate those items or projects which are least important to the academic plan (rather than cutting all programs equally), or to increase resources before a financial crisis develops. "What if" scenarios may reveal alternative solutions to academic or financial problems and influence decision makers to change policy decisions. Another advantage of computerized long range planning is the ability of decision makers to see immediately the financial implications of policy decisions on cash balances.

8.4 OUTPUTS OF THE MODEL

Outputs of the model are the integrated academic plans and financial plans based on policy decisions which determined the PPVs. These academic and financial plans can be presented to the school board for approval. After board members approve the long range plans, they become parameters for annual budgets, appropriations, and cash flow plans.

While empirical evidence (See Chapter 6) shows that few board members take part in financial planning, using the financial planning model with members of the school board is helpful when communicating financial information. In addition, if the school district has a citizens' committee which offers the board advice about how resources should be used, the integrated model developed here could be used to increase the members' understanding of the financial implications of implementing the academic plan.

The model contains forecasted receipts and expenditures aggregated by object codes for three years. These can be printed using the "Print Menu".

Financial data for the past three years and current year may also be printed for comparison purposes using the "Print Menu" ("PgDn" from main MENU).

If the integrated academic and financial plans are adopted by the school board at a public meeting, they become part of the minutes of the meeting and, hence, public documents. How widely the plans are published or how they are used to communicate financial information to the public is, however, a decision the school board must make. If financial plans are made public, however, assumptions underlying the plans and the policy decisions upon which the plans are based should also be publicized.

After integrated academic and financial plans have been adopted by the school board, budgets, appropriations, and cash flow documents should be prepared based on the financial plan. This model does not expand the financial plan to line items for use in budgets or appropriation. The financial plan does, however, set the parameters for decisions affecting spending for the years forecasted. As time passes, receipts and expenditures should be monitored to see how well actual figures agree with those forecasted. Important changes in exogenous variables which affect the academic and financial plans should be communicated by the district's administration to the school board with recommendations for policy changes if necessary. These changes should be processed through the financial planning model to see the effect over the long term. When the current fiscal year is completed, the historical data in the model should be updated and plans made to add another year to the integrated academic and financial plans.

8.5 SUMMARY

This chapter presents a procedure for collecting the data necessary for implementing the computerized model developed in this study. There are also recommendations for appointing a person or persons who would be responsible for completion of each task. It is suggested that enrollment data be entered first, then other historical data and exogenous variables. Next, the PPVs, which are the heart of the model, are varied until the cash balances are satisfactory. Then budget, appropriations, and cash flow documents are

prepared, and the model is updated at year end. Financial planning is presented as an ongoing dynamic process.

8.6 CONCLUSIONS

The final model computerized and tested in Chapter 7 is not difficult to implement. School administrators and board members should be involved from the beginning of the planning process with the setting of goals, objectives, and policy decisions. The historical data required by the model are available in school districts, and exogenous variables can be forecasted with the assistance of county auditors and members of the state departments of education. By varying enrollments and tax receipts, the effect of various possible external environments can be determined. Varying the PPVs will enable school district decision makers to view immediately the effect of academic decisions on cash balances in future years. All of the reviewers of the model agreed that the model is a tool which can help school district decision makers understand the financial implications of academic decisions. As decision makers become more familiar with what the model developed here can do, and what it cannot do, they may want to redesign and/or expand the model to meet their own special needs.

CHAPTER 9

SUMMARY AND IMPLICATIONS OF THE RESEARCH, AND SUGGESTIONS FOR FURTHER RESEARCH

9.0 INTRODUCTION

This chapter contains a summary of the entire dissertation, implications of the research, and suggestions for further research. The chapter is arranged as follows:

- 9.0 Introduction
- 9.1 Summary of the Research
- 9.2 Implications of the Research
 - 9.2.1 Questions to be Considered
- 9.3 Suggestions for Further Research
- 9.4 Summary

9.1 SUMMARY OF THE RESEARCH

Chapter 1 introduces the subject of the research which is the state of financial planning in school districts in the United States, and states in that chapter the aim of the project which is to assist school district decision makers with financial planning. The hypotheses and objectives of the research, a brief background of the problems and challenges facing school districts, and the scope and limitations of the research are listed. The organization of the chapters of the dissertation is presented.

Chapter 2 explores the literature related to school district organization and financing and discusses the pressures which various groups apply to school districts. It is suggested that long range financial planning might be a tool which would enable school district decision makers to keep their schools operating for a period of several years while providing the best academic programs which their resources could support.

Chapter 3 discusses business and academic planning, financial planning, and financial modeling in business and tertiary education institutions as well as school districts. A theoretical foundation for long range financial planning for primary and secondary school districts is established based on the experiences of business and tertiary education organizations using this tool. These organizations have used long range financial planning successfully to avert financial crises. School districts, although they differ in some respects from colleges and universities, could use financial planning to achieve long range fiscal health similar to what Hopkins and Massy (1981) refer to in tertiary education as "long run financial equilibrium" (p. 227).

Chapter 4 introduces the importance of integrating long range academic planning and financial planning in school districts, and proposes a normative integrated financial planning model for school districts, based on the literature. The elements of such a financial planning model are presented and discussed. Questions about the need for such a model for school districts are listed at the conclusion of the chapter. Also listed are questions posed by the researcher about the design and function of financial models currently operated in school districts. The answers to these questions were not found in the literature, and empirical work was undertaken to find out if and how computerized financial planning models are currently operated in school districts.

Chapter 5 analyzes replies to questions which were designed to test the hypotheses and further the objectives of the research. The responses supported the hypotheses, demonstrated the need for this research, and discovered the obstacles to implementation of computerized financial planning models.

Chapter 6 analyzes original relevant empirical research related to model design and compared it to the literature-based model presented in Chapter 4. The final generic resource-allocation financial forecasting model is described at the conclusion of the chapter.

Chapter 7 describes how the final model detailed in Chapter 6 was computer programmed and field tested by school district treasurers and other interested persons in the United States. Also presented in this chapter were the

comments of the reviewers and their suggestions for improving the model. The model was expanded to include an additional PPV and another exogenous variable. Testing of the model showed that reviewers gave their highest marks to the concept of the model as a tool to help school district decision makers understand the financial implications of academic decisions.

Chapter 8 presents guidelines to school districts seeking to implement the computerized version of the generic resource-allocation financial forecasting model. Included in this chapter was a procedure for collecting and entering information which encouraged the involvement of school board members and administrators from the beginning of the planning process.

Chapter 9 summarizes the entire study, discusses the implications of the research, and offers suggestions for future research.

9.2 IMPLICATIONS OF THE RESEARCH

This research was undertaken to assist school district decision makers with the financial planning process and, consequently, with decision making. The model developed at the culmination of the research was computerized to show practitioners how academic policy can be integrated with financial planning. The model was computerized and sent to school district treasurers and others for field testing. This section will attempt to evaluate the research project as a whole and determine whether or not the aims and objectives of the research have been met.

9.2.1 QUESTIONS TO BE CONSIDERED

Answers to the following questions will help to determine the success of the project and its implications for school district decision makers.

1. Was the aim of this research satisfied?
2. Were the hypotheses of this research adequately tested?
3. Were the objectives of this research fulfilled?
4. Was the literature survey adequate?
5. Was the empirical work productive?

6. Has the model been tested by school district decision makers?
7. Was the research worthwhile?
8. How does the research project add to knowledge?
9. What are the limitations of the research?
10. Will school district decision makers benefit by implementing the model developed to assist them with financial planning and decision making?

Was the aim of this research satisfied?

The aim of the research as stated in Chapter 1 was to assist school decision makers with financial planning and decision making. This aim was satisfied by the development of the integrated academic and financial planning model. The need for a computerized financial planning model designed specifically for school districts was shown by the considerable interest demonstrated by treasurers of school districts. Treasurers (93.3%) of districts which have developed long range financial plans showed almost as much interest in a computerized model as those (100%) from districts who think they need financial plans. By integrating academic decisions with financial decisions, the model can demonstrate to school board members and administrators the financial implications in the future of academic decisions made years earlier. If, as the literature and empirical work suggest, the use of models helps decision makers understand financial problems better and therefore make better decisions, then utilization of this model should provide assistance to school district decision makers. When the model was tested in the field by practitioners, the highest marks were received for the model as a tool to help school district decision makers understand the financial implications of academic decisions. They also agreed with the statement that schools which implement the model developed in this research will be more likely to understand their financial future than those which do not implement it. Therefore, the aim of the research has been satisfied.

Were the hypotheses of this research adequately tested?

The hypotheses are listed in Chapters 1 and 5. They relate to (1) whether or not school districts recognize the need for financial planning, (2) school districts' utilization of computerized financial plans, (3) the barriers which prevent school districts from implementing computerized financial plans, and (4) the interest of school decision makers in financial models designed specifically for school districts.

The hypotheses were tested by a questionnaire sent to all 616 school district treasurers in the State of Ohio which is considered a good test venue for school districts by several prior researchers (Christman, 1982; Cohen, 1983; Lee, 1982; Smith, 1985). Replies were received from 266 (43.2%) of the school districts. The replies which are relevant to the hypotheses and objectives were analyzed in Chapter 5. Various measures of support were found for each of the hypotheses. Findings of the research are as follows:

- * A significant number of school districts recognize the need for financial planning.
- * Few school districts use computerized financial planning models.
- * The most important barriers preventing school districts from utilizing computerized financial models are money and lack of expertise.
- * A significant number of school districts would consider using computerized financial planning models which are designed specifically for school districts in their state.

Were the objectives of the research fulfilled?

The objectives of the research as listed in Chapters 1 and 5 are to (1) determine if a significant number of school districts in the United States use computerized financial planning, (2) identify the factors which inhibit or advance the use of computerized long range financial plans, (3) adapt or develop a computerized financial planning model to assist school decision makers with long range financial planning.

The first two objectives were fulfilled by the questionnaire mentioned in No. 2 above. It was determined that very few (20.3%) of the school districts which responded to the survey use computers for financial planning. The replies also suggested that the most important barriers to computerized financial planning were lack of money and lack of expertise, as had been hypothesized. These barriers were taken into consideration during the computerization of the model. As a result, the model was designed to be operated on the least expensive hardware, a micro computer, and the model can be operated by persons with a minimum of computer expertise. The final objective was fulfilled by the development of the integrated financial planning model and by the computerizing and testing of the model by practitioners in the field.

Was the literature survey adequate?

The literature survey included a systematic, detailed search of material related to business and academic planning, long range planning, financial planning models, and modeling. In addition, material related to school district organization and financing was examined. The Educational Resources and Information Center (ERIC) of the United States Department of Education data bank of educational materials was searched six times for relevant publications. This data base consists of two subfiles: Resources in Education (RIE), covering unpublished education research reports and projects, and Current Index to Journals in Education (CIJE), covering approximately 750 journals and serial publications. Examples of the files searched are: financial support, money management, school districts, school funds, budgeting, program costs, school district spending, long range planning, financial planning, financial policy, and financial problems. In all, 315 abstracts were scanned for relevant material which was obtained and studied. The Dissertations International Abstracts data bank was searched for relevant theses and dissertations, and seven applicable documents were examined. The search of literature was on-going throughout the project and included very recent publications. The literature survey was published by the Department of Accountancy, Massey University, New Zealand, as a discussion paper. Seventy-five books, journal articles, reports, and newspapers were referenced in the dissertation. No literature survey can be all encompassing, and articles which might have contributed to the research may have been overlooked. However, the literature survey most likely was quite adequate.

Was the empirical work productive?

This purpose of this research was to discover if and how school districts conduct financial planning, and the empirical work was designed to find information which was not found in the literature. All (616) of the school district treasurers in the State of Ohio were asked all of the questions found at the conclusion of Chapter 4 as well as other questions related to the subject. Respondents (266) to the five page questionnaire gave evidence that more than half of them (54.2%) engage in long range financial planning, but that few of them (20.3%) use computerized financial planning models. Chapters 5 and 6 contain analyses of the replies to the questionnaire which test the

hypotheses, further the objectives, and describe how financial planning is conducted currently in school districts. Replies to the questionnaire contained descriptions of how financial planning was conducted, who took part in budgeting and financial planning, how models were designed and operated, and additional information relevant to school district financial planning in the late 1980s. The empirical work added new information to the literature describing school districts and their financial planning processes and was, therefore, productive.

Has the model been tested by school district decision makers?

The advice of colleagues at Massey University was sought at a staff seminar to determine the best methods for evaluating the model. The consensus was that field testing of the model would be the most appropriate method. Therefore, the financial planning model was computerized and test model disks were sent to school district treasurers in the State of Ohio who had indicated that they owned Lotus 1-2-3 and would be willing to evaluate the model. They were asked to test the model and to report on its effectiveness as a method of integrating academic and financial long range planning. Their comments and recommendations were presented in Chapter 7. Through the testing and evaluation of the model, recommendations for the addition of another exogenous variable and another PPV were accepted. The model was expanded to include these two items. The treasurers who returned the evaluation forms agreed that school districts which implement the model developed in this research are more likely to understand their financial future than those which do not implement it, and highest marks were for the model as a tool to help school district decision makers understand the financial consequences of academic decisions. Therefore, the model has been tested in the field by school district decision makers, and they have found it satisfactory.

Was the research worthwhile?

The conclusion was reached in Chapter 3 that long range financial planning, which has been successful in business and tertiary education, may be equally useful for school districts. However, little was found in the literature that described how school districts were coping with their financial problems. Some authors suggested that long range planning was new to school districts

(Martin, 1987) and multi-year financial planning was lacking in several urban school districts (Cibulka, 1987). Then, the empirical work analyzed in Chapter 5 gave evidence that most school districts recognize the importance of financial planning (96.5%) and would consider using a computerized financial planning model but that only 54.2% of those same districts already have financial plans. The barriers to computerized financial planning in school districts were found to be lack of money and expertise to develop financial planning models. Unlike many research projects, the results of this study can make a difference to school districts. The model developed in this study is inexpensive, easy to use, and is considered to be generic. It can assist school district decision makers with financial planning and decision making. The conclusion is, therefore, that this research, which culminated in the development of an integrated academic and financial planning model for school districts, is worthwhile.

How does the research project add to knowledge?

Replies to the questionnaire sent to school districts as part of the empirical work of this research contributed information about school district financial planning which was not part of educational literature previously (see No. 5 above). Neither the literature survey nor the empirical work discovered a computerized generic financial planning model for school districts. This research developed and field tested a model designed to integrate academic and financial planning for school districts. The model was designed for school districts in the State of Ohio, but it is considered to be generic and can easily be adapted for school districts in other states. The computerized model was designed to forecast the financial implications of academic decisions three years into the future but can easily be expanded. If even a few of the 15,000 school districts in the United States improve their financial planning as the result of this research and the development of the model, the project will have contributed to knowledge.

What are the limitations of the research?

The most serious limitation of the financial planning model is in the area of forecasting school district receipts. Nothing was found in the literature which gave direction for forecasting tax receipts. Christman (1982) and Brandt (1986) recognized the difficulties involved in figuring tax receipts even one year

in advance of collection. While tax receipts are a function of the assessed valuation of property in districts and tax levies, many kinds of tax relief in the form of legislative credits and rollbacks distort the final tax figures. The subject is important because 49 states (Hawaii is the only exception) rely on the property tax for funding schools. One of the treasurers who took part in the testing of the computerized model sent a copy of his district's financial plan (unpublished and unavailable to researchers) with the evaluation form. The document includes a ten year history of the assessed valuation of all of the types (7) of property which form the base for his district's tax collection. An example of how difficult it is to use historical assessed valuations for forecasting purposes is shown in Figure 4-3. During the past ten years, the assessed valuation of public utility real property changed from -48% annual decrease in one year to +52.4% annual increase four years later. The increase in residential property, generally considered more stable than public utility property, changed in one year from +25.1% to +.56%. Because of the great variations from year to year, it is recommended that assessed valuations be used for indications of trends, but that the county auditor be consulted to test the reasonableness of normatively derived tax revenue forecasts. Although political considerations will always influence the collection of taxes, perhaps further research will discover an accurate way to forecast tax receipts mathematically in districts where fluctuations in assessed valuations are reasonably stable. Receipts from state foundation programs are equally as important as tax receipts in many districts, but they are determined by state legislatures and are out of the control of school districts. Other local receipts include tuition from other districts, and the amount of those receipts is determined by the state board of education. For the above reasons, the empirical work did not ask about forecasting of receipts, and the model suggests that receipts be forecasted normatively. This is recognized as a limitation of the research.

While the questionnaire was sent only to school district treasurers in the State of Ohio, this is not considered a serious limitation of the research for the reasons stated in Chapter 5. Ohio is considered a good test venue for empirical research of school districts because of the similarity of its school districts to those in other states. The model produced here is considered to be generic and adaptable easily for other schools and school districts.

The financial planning model is not intended to solve all of the financial problems of school districts. It is hoped, however, that it will be useful to school district decision makers as they attempt to keep their schools financially viable while providing quality education for their students. It is recognized that this model will be superseded by better, more complete, and more sophisticated models as they become available to school districts.

9.3 SUGGESTIONS FOR FURTHER RESEARCH

Little information was available in the literature which specifically addressed financial planning for school districts. This research added to knowledge about the subject, but much more study is needed. The first concern of school district decision makers is the academic program offered to their pupils, and rightly so. However, the long range financial implications of academic decisions must be addressed so that the vital process of educating pupils is not interrupted by financial crises. School districts have indicated that they lack the time and expertise to develop their own financial planning models, so researchers outside of the districts themselves should be encouraged to develop the necessary research.

One area that requires additional attention is the forecasting of school district revenues. The attempt by state legislatures to mitigate the effects of double digit inflation on property taxes has left a maze of diverse legislation in its wake. State and county auditors determine the amount of tax to be collected using complex formulae based on this legislation and notify school districts of the amount they can expect to receive if all taxes are collected. Research in this area may shed new light on ways to forecast receipts more than a few months into the future. Smith's (1985) finding that school district tax receipts may be more dependent on assessed valuation than on tax levies is an area which requires further research. This finding runs counter to the widely held view that school districts can increase school district resources by passing levies.

Earnings on investments is another subject which could prove to be an interesting and worthwhile topic of research. The relationship between cash

balances, borrowing policies, and investment procedures compared with earnings on investments should be helpful to school decision makers as they attempt to increase resources. Dembowski (1981, p. 105) found that school districts can increase their earnings by improving cash management techniques. The development of computerized models with cash management procedures would aid treasurers wishing to utilize this technology.

The integrated financial planning model does not include budgets, appropriations, or cash flow plans. Following financial planning, these should be prepared for each of the forecasted years. The figures in the financial plan are the parameters for these short range plans. Research which would enhance the transition from aggregated long range financial planning to detailed, line item annual planning would be helpful to school decision makers.

Future integrated financial planning models for school districts might address the costs to local school districts of operating special education classes, classes for handicapped or learning disabled pupils, vocational education, early childhood education, and after school custodial programs. The staffing sub model might be expanded to show the effects of student registration for high school classes on the need for specialized teachers. The expenditure section of the financial planning sub model could be programmed to forecast the costs of regular textbook and equipment replacement programs based on enrollment and inflation forecasts, if no changes in the academic program are contemplated. The costs of changing individual programs could then be determined and added or deducted separately. Finally, further research into school district computerized financial planning models should produce more sophisticated models than the one introduced here.

Following the operation of computerized integrated academic and financial planning models for several years, research could be undertaken to determine whether barriers to computerized planning for school districts still exist.

9.4 SUMMARY

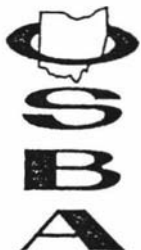
This final chapter summarizes each of the chapters in the dissertation and notes their contribution to the research. The literature survey and the empirical work are discussed in conjunction with questions relating to the implications of the study. The contribution of the research to knowledge is noted, and the limitations of the study and the model are described. Finally, suggestions for further research in the field of school district financial planning are presented, and the dissertation is complete.

REFERENCES

CHAPTER 9

- Brandt, J.M. (1986). Ohio school financial handbook (rev.) based on R.G. Stabile & P.E. Spayde, *What every Ohio citizen should know about school finance*. Westerville, OH: Ohio School Boards Association.
- Christman, L.H. (1982). *Streamlining local school budgeting in Ohio*. Cleveland, OH: Citizens' Council for Ohio Schools. (ERIC Document Reproduction Service No. Ed 233 457).
- Cibulka, J.G. (1987). Theories of educational budgeting: Lessons learned from the management of decline. *Educational Administration Quarterly*, 23(1), 7-40.
- Cohen, M.C. (1983). Tax capacity, tax effort, and state funding of schools in Ohio. *Journal of Educational Finance*, 9(2), 141-156.
- Dembowski, F.L. (1981). An inventory-theoretic approach to school district cash management. *Educational Administration Quarterly*, 17(1), 91-106.
- Hopkins, D.S.P. & Massy, W.F. (1981). *Planning models for colleges and universities*. Stanford, CA: Stanford University Press.
- Lee, R. (1982). *Financial and staffing ratio analysis: Predicting fiscal distress in school districts*. Unpublished doctoral dissertation, Ohio State University.
- Martin, D.B. (1987). *Long range planning for school districts*. Westerville, OH: Ohio School Boards Association.
- Smith, K. (1985). *Forecasting school district fiscal health*. Unpublished doctoral dissertation, Ohio State University.

APPENDIX A

**Ohio School Boards Association**

P.O. Box 6100 • Westerville, Ohio 43081-6100 • 614-891-6466

TO: Treasurers, Ohio School Districts
FROM: Craig Gifford, Executive Vice President
DATE: January 22, 1988
RE: Financial Planning Questionnaire

Enclosed you will find a Financial Planning Questionnaire designed especially for Ohio School Districts which Lois Graff former Parma School District Treasurer has developed as part of her doctoral research project at Massey University in Palmerston North, New Zealand.

Lois, also a former member of the Board of Education in Parma has a keen interest in Ohio Schools, financial planning and fiscal practices. She is currently serving on the faculty at the University in the Department of Accounting.

I have reviewed the questionnaire with her and have been assured that OSBA will be advised of the results which will be published in a future Journal. Because of Mrs. Graff's interest and expertise in and potential help to Ohio School Districts, I encourage you to take a few minutes to respond to this.

APPENDIX B

**FINANCIAL PLANNING QUESTIONNAIRE
FOR OHIO SCHOOL DISTRICTS**

Mail to: L.M.Graff, c/o OSBA, P.O. Box 6100, Westerville, OH 43081-6100
This questionnaire is part of a doctoral research project investigating financial planning practises in Ohio school districts. I would appreciate your help by completing the questionnaire BEFORE MONDAY, FEBRUARY 7, 1988. It will take only five to ten minutes.

Part I of the questionnaire asks about your district's financial planning and budgeting processes. **Part II** should be completed ONLY if your district uses **computer financial models**. It may best be answered by a person involved in designing and/or running of the models.

INFORMATION: Please tell me something about you and your district. This information will be kept strictly confidential. Your district will not be named in any report.

District _____ Kind of district _____
(e. g. City, Local) _____ County _____
What is your 1987-88 ADM? _____
What are your approximate total appropriations for 1987-88?
ALL FUNDS \$ _____ GENERAL FUND \$ _____

PART I.

1. Do you have a long range financial plan? YES ___ NO ___
("Long range" means any plan beyond the 1988-89 budget)

If YES, for how many **years** does it extend **past** the **1987-88** appropriations? _____ YEARS
Is the **1988-89 budget** based on the first period of the financial plan? YES ___ NO ___

Please go to question 2 and continue to answer questions about your FINANCIAL PLANNING.

If NO, do you think your district needs a long range financial plan? YES ___ NO ___

If you think you need a long range financial plan, please continue to answer questions 2 and 3 about your BUDGETING process, AND questions 4, 5, 6 and 7.

If you see no need for a long range financial plan, please stop now and mail this one sheet to the above address. THANK YOU FOR ANSWERING THIS QUESTIONNAIRE.

2. At what level do you do financial planning? Please check all which apply. (Use "budgeting" for questions 2 and 3 if you don't do financial planning.)

	Line Items	Depart- ments	SM1 Level	Individual Schools
Financial Planning	_____	_____	_____	_____
Budgeting	_____	_____	_____	_____

3. How often do each of the following participate in financial planning OR budgeting? (Please check all which apply.)

	Never	Rarely	Occasionally	Usually
Board Members	_____	_____	_____	_____
Superintendent	_____	_____	_____	_____
Treasurer	_____	_____	_____	_____
Others (Who?) _____	_____	_____	_____	_____

Page 2

4. Please indicate briefly how you forecast, during personnel negotiations, the future costs of wage, salary, and fringe benefit alternatives (e.g. manual estimation, computer model, etc.).
-
-

5. IF YOUR DISTRICT CURRENTLY USES COMPUTERIZED FINANCIAL PLANNING MODELS, do not answer questions 5, 6, and 7. **Go to Part II.** OTHERWISE, indicate whether you strongly disagree or strongly agree with the following statements.

	Strongly Disagree			Strongly Agree	
	0	1	2	3	4
a) We tried computer models but quit using them.	___	___	___	___	___
b) Computer models are of little practical use.	___	___	___	___	___
c) Models are too complicated to understand.	___	___	___	___	___
d) Computers allow too much control by data processing personnel.	___	___	___	___	___
e) Our administrators do not like to use keyboards.	___	___	___	___	___
f) Decision making is largely political.	___	___	___	___	___
g) Our administrators do not have time to learn modeling skills.	___	___	___	___	___
h) Micro computers and programs are too expensive for this district.	___	___	___	___	___

6. Are there other reasons why your district is not using computerized financial planning? Please describe them.
-
-

7. Would you consider using a computerized financial planning model which was designed specifically for Ohio school districts?
YES ___ NO ___

THANK YOU FOR ANSWERING THIS QUESTIONNAIRE.

Please mail this sheet to the address on the front of this page. Complete Part II only if your district uses computerized financial models.

PART II Please answer these questions Page 3
ONLY IF YOUR DISTRICT USES COMPUTERISED FINANCIAL MODELS.

8. For how many years has your district used models? _____ years
9. A. Please indicate under "A" approximately how often the decisions listed below are made.
 VF = very frequently (more than once a month)
 F = frequently (several times a year)
 I = infrequently (once a year or less)
 N = never
- B. Please check "B" if you currently use computerised financial models to assist in these decisions.
- C. If computer models are used for these decisions, please check if YOU feel that modeling is useful for these decisions.

<u>Types of Decision</u>	A	B	C
	how often? (VF,F,I,N)	modeling? (check if YES)	useful?
Short/medium term cash planning & investment of surplus funds	___ ___ ___ ___	___	___
Capital projects	___ ___ ___ ___	___	___
Staffing planning	___ ___ ___ ___	___	___
Enrollment planning	___ ___ ___ ___	___	___

10. Please indicate the three areas in which computer models have been most helpful in your district. Most helpful No.1, etc.
 Models help:
- a) our district to make better decisions. _____
 - b) our decision makers to better understand finances. _____
 - c) to communicate financial decisions to board members and the community. _____
 - d) to communicate financial decisions to staff. _____
 - e) schools and departments to make claims for district resources. _____
 - f) (list other ways) _____

11. Who initiated your models? Who operates them? Please check.
- | | | |
|--------------------|---------------|--------------|
| | a) Initiators | b) Operators |
| Board | | |
| Superintendent | ___ | ___ |
| Treasurer | ___ | ___ |
| Other (Who?) _____ | ___ | ___ |

12. Who designed your models?
- | | |
|----------------------------------------------------|-----|
| Administrators (Superintendent, Treasurer, others) | ___ |
| Outside consultants | ___ |
| Computer staff | ___ |
| Others (Who?) _____ | ___ |

13. Do any of your administrators build and operate their own models? YES ___ NO ___
- If **NO**, go to page 4. If **YES**, is this because:
- they do not care to use other peoples' models they don't understand, _____
 - the construction of models gives insight into policy decision variables, _____
 - useful models for school districts are not available, or _____
 - they prefer to control their own decision support system? _____

PLEASE CHECK ALL THE ANSWERS WHICH APPLY

Page 4

14. Do you forecast teacher requirements by:
- class enrollments _____
 - teacher/pupil ratio _____
 - absolute dollar amounts _____
 - other? (describe briefly) _____
15. Do you forecast enrollment by:
- cohort method _____
 - class progression _____
 - birth records _____
 - census _____
 - other? _____
16. Do you use any statistical techniques for forecasting enrollment or expenses?
- historical trend (moving average, percent of resources, etc.) _____
 - causal (e.g. multiple regression) _____
17. Do you deal with uncertainty by:
- manipulating variables (What if?) _____
 - using stochastic variable (risk analysis) _____
 - maintaining a reserve fund _____
 - using sensitivity analysis to determine critical variables _____
 - using other methods (please describe briefly) _____
18. Do you run financial planning models on mainframe? _____
- mini? _____
 - micro? _____
19. How are your models programmed? Please write program name.
- using microcomputer type spreadsheet (Lotus 1-2-3, Visicalc, etc.) _____
 - using a modeling language or DSS generator (IFPS, FCS/EPS, Empire, etc.) _____
 - using a standard programming language (COBOL, FORTRAN, etc.)? _____
20. Approximately how many line items do you have in your financial planning Model _____
21. Do your models have on line access to
- model specific database _____
 - district database _____
 - external database _____
22. Would you be willing to evaluate a financial planning model specifically designed for Ohio school districts? YES ___ NO ___
- If YES, your address please _____

UNLESS YOUR DISTRICT USES MICROCOMPUTERS FOR FINANCIAL PLANNING,
PLEASE STOP NOW AND MAIL THE QUESTIONNAIRE TO THE ADDRESS ON THE
FOLLOWING PAGE. ANSWER THE QUESTIONS ON PAGE 5 ONLY IF YOUR DISTRICT
USES **MICRO COMPUTERS** FOR FINANCIAL PLANNING.

ANSWER THE FOLLOWING QUESTIONS ONLY IF YOUR DISTRICT USES **MICRO COMPUTERS** FOR FINANCIAL PLANNING.

23. Have you previously used mainframes (yours, consortium equipment, or time sharing) for financial planning and switched to micros? YES ___ NO ___

If NO, please go to question 24.

If YES, did you switch to micros because:

- a) micro computers are cheaper, _____
 b) spreadsheets are easier/quicker to produce, _____
 c) spreadsheets do not require programming skills, _____
 d) micros are not controlled by data processing dept. _____
 e) not enough access to mainframe/consortium, _____
 f) some other reason? (Please briefly specify.) _____

24. Is your financial planning model integrated with your district's computerised management information system? YES ___ NO ___

If your administrative office has only ONE MICRO COMPUTER, skip questions 25 and 26.

25. Are your microcomputers standardised as to make and operating system? YES ___ NO ___
26. Can your micros communicate with each other? YES ___ NO ___

THANK YOU FOR ANSWERING THIS QUESTIONNAIRE.

Please use the enclosed envelope to mail completed questionnaire to

Lois M. Graff
 c/o Ohio School Boards Association
 P. O. Box 8100
 Westerville, OH 43081-6100

APPENDIX C

THANK YOU!!! THANK YOU!!! THANK YOU!!!

Thank you for taking part in the survey of Ohio School District financial planning practices by returning the questionnaire you received in January.

Results will be published in the Ohio School Board Journal as soon as possible.

If you haven't mailed your questionnaire yet - it's not too late. Please do it soon so your district can be included.

Send questionnaires to:

Lois M. Graff

c/o Ohio School Boards Association

P.O. Box 6100

Westerville, Ohio 43081-6100

APPENDIX D

January 22, 1988

Mr. -----, Executive Director
Street Address
City, State
Zip Code

Dear Mr. -----,

Last week questionnaires were sent to all the school districts in Ohio asking about financial planning beyond the legally required annual budget. The purpose of this research, which has the support of Craig Gifford, Executive Vice President of the Ohio School Boards Association, is to discover if and how financial planning models are being used by school districts.

Although most of the research is being done in Ohio, I would like to know about school district financial planning models which are being used in your state. The result of this study will be to adapt or develop a generic financial planning model specifically for school districts.

If you know of financial planning models, particularly ones developed for micro computers, which are being used in your state, please send me the name, address and phone number of a contact person in the district. A return envelope is enclosed for your convenience.

This research is part of the PhD program at Massey University, N. Z. Thank you for your consideration.

Sincerely,

Lois M. Graff, CPA, MBA
c/o Ohio School Boards Association
P.O. Box 6100
Westerville, Ohio 430-81-6100

ANSWERS TO QUESTIONS RELATED TO HYPOTHESES
(INCLUDES PERCENT OF RESPONDENTS
ANSWERING SPECIFIC QUESTION)

*****KEY TO ABBREVIATIONS*****
 FP=FINANCIAL PLAN FPC=FP COMPUTERIZED NPY=NP, NEED ONE
 NP=NO PLAN FPN=FP NOT COMPUTERIZ NPN=NP, DON'T NEED
 CM=COMPUTER MODEL FPM=FP ON MICRO NPC=NP, SOME CMs
 SDs=SCHOOL DISTRICTS CFP=COMPUTERIZED FINANCIAL PLAN

HYPOTHESES		FPN	FPC	GROUPS OF RESPONDENTS			TOTAL	PERCENT OF TOTAL REPLIES		
				FPM	NPY	NPN				
1. Most SDs recognize need for FP										
q 1 Do you have plan?	YES	89	17	37			143	54.2%		
	NO				98	18	121			
									93.2%	
If not, need one?	YES				98		103	85.1%		HAVE OR
	NO					18	18			NEED FP
2. Few SDs use comp. FPs.							0			
q 5 & 6 No computerized FP		89			98	18	210	79.5%		
q 8-20 Have computerized FP.			17	37			54	20.5%	NEITHER	% OF
									AGREE NOR	TOTAL
									DISAGREE	REPLIES
3. Why no CFPs? Few \$/expertise							0			
q 5 & 6 a. tried but quit		45			41		86	DISAGREE	9	87.8%
		3			0		3	AGREE		3.1%
b. CM not practical		42			37		79	DISAGREE	25	69.9%
		8			1		9	AGREE		8.0%
c. Models too complicated		43			39		82	DISAGREE	20	78.8%
		2			0		2	AGREE		1.9%
d. Too much DP control		51			38		89	DISAGREE	15	84.0%
		1			1		2	AGREE		1.9%
e. Admin don't like keybds		27			30		57	DISAGREE	29	54.3%
		9			10		19	AGREE		18.1%
f. Dec making is political		38			25		63	DISAGREE	31	59.4%
		3			9		12	AGREE		11.3%
g. No time to learn skills		27			24		51	DISAGREE	30	46.8%
		15			13		28	AGREE		25.7%
h. Micros etc. too expensi		34			19		53	DISAGREE	28	47.7%
		12			18		30	AGREE		27.0%
q 6 Other-number of responses		42			41		83			
4. SDs who don't use CFPs would consider model for SDs										
q 7 Would consider CFP specifically for SDs	YES	70			68		138			96.5%
	NO	5			0		5			3.5%

APPENDIX F



Massey University

PALMERSTON NORTH, NEW ZEALAND

TELEPHONES: 69-079, 69-089, 69-099
DATEX: NZ 30974, Mas Uni

In reply please quote:

November 24, 1988

Dear Treasurer,

Greetings from New Zealand. Earlier this year you answered a questionnaire about financial planning for school districts. At that time you indicated that you would be willing to evaluate a computerized financial planning model developed specifically for school districts in Ohio. The model is ready for testing, and this letter is to let you know that it will soon be sent to you.

What I hope you will do is to devote an hour or two in December or early January to evaluate the model. To access the model you will need either Lotus 1-2-3, version 2, or VP Planner on your micro computer. The financial planning model is a prototype; it is not a commercial, "user friendly" program. However, the instructions will be written clearly, and you should have no difficulty operating the model. With the disk will be an evaluation form which you are asked to complete and mail before January 10, 1989.

The purpose of the evaluation is to make sure the model meets the needs of school districts in Ohio. It is sufficient to determine that the model asks for the necessary information to formulate financial plans and that the model works properly.

Only a very few Ohio treasurers are being asked to submit their opinions. So if for some reason you cannot devote the hour or two needed to evaluate the model, please write "NO THANKS" on this letter and return it in the enclosed envelope at once.

Thank you very much for your consideration. Enjoy your holidays!

Sincerely,

A handwritten signature in cursive script that reads "Lois M. Graff".

Lois M. Graff
Department of Accountancy



Massey University

Department of Accountancy

PALMERSTON NORTH, NEW ZEALAND
Telephones (063) 69-079, 69-089, 69-099
Datex: NZ 30974, Mas Uni

In reply please quote:

December 1, 1988

Here is the disk I promised you with instructions (white), an evaluation form (blue), and a return envelope. Remember, this is a test model, so it isn't as polished as most programs you have used.

The primary planning variables (PPVs) on screen "Alt E" are the heart of the model. They allow you to play "what if" scenarios by changing any or all of them to implement policy decisions made by the school board or administration. This should help your district to integrate policy decisions with long range financial planning.

The model is protected, so numbers can be changed only on the input screens. If you try to enter anything elsewhere, the "ERROR" message will appear in the upper left hand corner of the screen. Just hit the "Esc" key a few times, and it will be all right. A printed copy of the MENU appears on the instruction sheet as well as on the disk to facilitate movement between screens.

If you have only a limited amount of time to test the model, you may want to use the sample numbers and just change them randomly to see what happens. to the forecasted receipts, expenditures, and cash balance.

Please mail the blue evaluation form in the enclosed envelope before January 10, 1989. You may keep the disk. THANKS AGAIN for your help.

MERRY CHRISTMAS AND HAPPY NEW YEAR!!!

Lois M. Graff
Department of Accountancy

INSTRUCTIONS FOR USING THE
INTEGRATED FINANCIAL PLANNING TEST MODEL

READ INSTRUCTIONS THROUGH BEFORE STARTING TEST MODEL

The test model is designed to be used with Lotus 1-2-3, Version 2. When the worksheet appears on the screen, place the test model disk in the "A" drive and close the drive.

Retrieve the model from the disk to the screen by typing /FR Press the RETURN (or ENTER) key. The TITLE PAGE will appear.

The MENU can be reached by typing "PgDn" (on the right hand side of the keyboard), or by (1) holding down the "ALT" key (on the left hand side of the keyboard) and (2) depressing the "M" key at the same time. The MENU lists all of the screens. By holding down the "Alt" key and the letter listed, any of the screens can be accessed.

The MENU can be reached from any part of the model at any time by typing "Alt M" in this way. IF ALL ELSE FAILS, PRESS THE "Esc" KEY (Right hand side of keyboard) 5 OR 6 TIMES--THEN "Alt M" FOR MENU.

The MENU looks like this:	Press "Alt..."
1. Input Exogenous (External) Variables.....	A
2. Input Enrollments - First Grade & Birth Records.....	B
Input Other Enrollments ("Alt B", then "PgDn")	
3. Enrollment - Cohort Survival Ratios.....	C
4. Forecasted Enrollments.....	D
5. Input PPV's.....	E
6. Input or Import Personnel Historical Data.....	F
Input Financial Data - Receipts.....	G
8. Input Financial Data - Expenditures.....	H
9. Staffing Outputs.....	I
10. Forecasted Receipts.....	J
11. Forecasted Expenditures.....	K
12. Summary of Important Outputs.....	L
13. SAVE results of Model.....	S
14. QUIT.....	Q

...to move to the
desired location.

For PRINT MENU press "PgDn"

Numbers can only be entered in areas which are highlighted. To enter numbers, (1) place the blinking cursor in the proper position by using the arrow keys on the right of the keyboard, (2) enter (type) the proper figures using the numbers at the top of the keyboard. Then (3) move the cursor to the next position. If you make an error, press "RETURN" and type correct figure directly on top of the wrong one. DO NOT USE A "\$" comma, period or blank space when entering numbers. Enter percents as decimals (.12) without the "%" sign. (Totals may be in error by one digit as the result of rounding.)

Input areas are highlighted. Sample figures are entered in the model to serve as examples.

1. Begin the financial planning procedure by putting into the model (1) enrollments ("Alt B" and "Alt B" "PgDn") (IF YOU CANNOT SEE THE HIGHLIGHTED AREAS ON THIS SCREEN, ADJUST THE KNOBS ON THE FRONT OF YOUR MONITOR) (2) birth records, and (3) financial information IN THIS ORDER. (MENU has screens listed in a different order.) For testing purposes you may want to use some of the figures already in the model or input estimates for enrollments and birth records instead of real data. Information for the financial sections can be taken from your SM1 for 1988 or 1989.

2. Next, exogenous (external) variables should be input. These are the variables over which your district has little or no control but which directly affect your district. For testing purposes you may want to insert reasonable estimates instead of contacting the county auditor or the state Department of Education for their latest information about tax and foundation estimates.
3. Primary planning variables (PPVs) on "Alt E" are under the full or partial control of school boards and administrators. The purpose of this model is to integrate policy decisions by school decision makers with long range financial planning. As primary planning variables (PPVs) are changed to reflect changing policies, the financial effect for the next three years is seen on "Alt L". (The full effect can be seen on the Financial Forecast screens "Alt J" and "Alt K").

Primary planning variables (PPVs) include

- (1) the rate (%) salaries and wages will increase because of increments, graduate credit, and longevity with no increase on the base;
- (2) preferred pupil/teacher ratio (number of pupils per teacher);
- (3) number of teachers above or below those needed for P/T ratio (e.g. for special programs);
- (4) cost of increase or decrease in administrators and classified;
- (5) receipts from newly passed or anticipated levies;
- (6) negotiated or anticipated salary increases for certificated and classified.
- (8) The earnings rates on investments for the past three years are shown on "Alt I". Use them, if you wish.
- (9) This same screen ("Alt I") will also have the percentage of salaries and wages which comprise the cost of fringe benefits in your district. These are suggestions. Increase or decrease as you wish.
- (10) Enter cost of buses when needed and the
- (11) percent that the state will reimburse.
- (12) Other capital purchases are entered in dollar amounts;
- (13) a percent increase over current expenses for purchased services
- (14) and materials and supplies (inflation rate, growth, or other).
- (15) Increases in other expenses should include interest on all loans. Loans and repayments are not included in the model.

The most important output is, of course, the cash balance which is show on "Alt L". If the school district can financially support the policy decisions which control the PPVs, they can adopt the staffing, curriculum, and financial plans. If cash balances for the next three years are not satisfactory, policies (and PPVs) can be changed or levies passed to keep the district operating. You may want to try different "what if" scenarios by manipulating the variables. The model projects for only three years, but it can easily be extended.

Screens "Alt J" and "Alt K" contain forecasted receipts and expenditures for the next three years. You may wish to print these screens using the PRINT MENU.

When you have finished testing the model, please complete the BLUE EVALUATION FORM and mail it to me as soon as possible in the enclosed envelope. The disk is yours to keep. I hope you will find it useful. If all goes well, a version of this model will be available to all school districts in the near future.

Thanks again for your help. I couldn't have done it without YOU!

Lois M. Graff, Department of Accountancy
Massey University, New Zealand

EVALUATION OF
INTEGRATED FINANCIAL PLANNING TEST MODEL

Once you have tested the Integrated Financial Planning Test Model, please complete the following evaluation. Each of the statements is worded positively. To the extent that you agree or disagree with each statement, please mark the appropriate place on the five point scale.

I particularly welcome any comments or suggestions for improvement of the model which you wish to make. They can be written on the back of this sheet.

1. The purpose of the model is to help decision makers with long range financial planning. The model fulfills this purpose.

Strongly Disagree				Strongly Agree
0	1	2	3	4

2. The primary planning variables (PPVs) reflect adequately the policy decisions which must be made by the school board and administration.

Strongly Disagree				Strongly Agree
0	1	2	3	4

3. Varying the primary planning variables (PPVs) and observing future cash balances in this model helps decision makers (school board and/or administrators) to understand the financial implications of curriculum and staffing decisions.

Strongly Disagree				Strongly Agree
0	1	2	3	4

4. All of the necessary primary planning variables (PPVs) are included in the model. (If any are missing, please list them here.)

Strongly Disagree				Strongly Agree
0	1	2	3	4

Missing PPVs are _____

5. The model includes all other necessary information for long range financial planning.

Strongly Disagree				Strongly Agree
0	1	2	3	4

Other information needed _____

6. The information asked for in the model can be assembled quickly and inexpensively.

Strongly Disagree				Strongly Agree
0	1	2	3	4

7. The model can be helpful for communicating financial information to board members.
- | | | | |
|--|----------------------|---|-------------------|
| | Strongly
Disagree | | Strongly
Agree |
| | 0 | 1 | 4 |
8. The model can help communicate financial information to the community and/or staff.
- | | | | |
|--|----------------------|---|-------------------|
| | Strongly
Disagree | | Strongly
Agree |
| | 0 | 1 | 4 |
9. The model is flexible enough to be functional in most school districts.
- | | | | |
|--|----------------------|---|-------------------|
| | Strongly
Disagree | | Strongly
Agree |
| | 0 | 1 | 4 |
10. School districts which implement the model will be more likely to understand their financial future than those which do not implement it.
- | | | | |
|--|----------------------|---|-------------------|
| | Strongly
Disagree | | Strongly
Agree |
| | 0 | 1 | 4 |
11. The model can be used with a minimum of computer experience.
- | | | | |
|--|----------------------|---|-------------------|
| | Strongly
Disagree | | Strongly
Agree |
| | 0 | 1 | 4 |
12. All of the information needed for financial planning was included in the primary planning variables.
- | | | | |
|--|----------------------|---|-------------------|
| | Strongly
Disagree | | Strongly
Agree |
| | 0 | 1 | 4 |
13. I would recommend that my district take steps to implement this model or a similar one within the next year. If not, state why not in question 14.
- | | | | |
|--|----------------------|---|-------------------|
| | Strongly
Disagree | | Strongly
Agree |
| | 0 | 1 | 4 |
14. Specific comments and suggestions are as follows:

PLEASE MAIL THIS EVALUATION IN THE ENCLOSED ENVELOPE. Thanks again for your invaluable assistance.

Lois M. Graff, Department of Accountancy
Massey University, New Zealand

APPENDIX G

A	B	C	D	E	F	G	H	
4		*****						
5		*					*	
6		*	A GENERIC RESOURCE ALLOCATION				*	
7		*					*	
8		*	FINANCIAL FORECASTING MODEL				*	
9		*					*	
10		*****						
11								
12								
13		By:	Lois M. Graff					
14			CPA, MBA					
15								
16			Dept. of Accountancy					
17			Massey University					
18			New Zealand					
19								
20			January 1989					
21								
22								
23			Press "PgDn" or "Alt M" for Menu					

A	B	C	D	E	F	G	H	
24	**	MENU						**
25							Press "Alt..."	
26		1.	Input Exogenous (External) Variables.....				A	
27		2.	Input Enrollments - First Grade & Birth Records... Input Other Enrollments				B	
28								
29		3.	Enrollment - Cohort Survival Ratios.....				C	
30		4.	Forecasted Enrollments.....				D	
31		5.	Input Primary Planning Variables (PPVs).....				E	
32		6.	Input or Import Personnel Historical Data.....				F	
33		7.	Input Financial Data - Receipts.....				G	
34		8.	Input Financial Data - Expenditure.....				H	
35		9.	Staffing Outputs.....				I	
36		10.	Forecasted Receipts.....				J	
37		11.	Forecasted Expenditure.....				K	
38		12.	Summary of Important Outputs.....				L	
39		13.	SAVE results of model.....				S	
40		14.	QUIT.....				Q	
41							...to move to the	
42							desired location.	
43			For PRINT MENU press "PgDn"					

	A	B	C	D	E	F	G	H
44								
45		PRINT MENU						
46		BE SURE THE PRINTER IS TURNED ON.						
47								
48								
49								
50		1. To print out the financial forecasts of receipts and						
51		expenditures, press "ALT P".						
52								
53		2. To print out historical financial data:						
54		Press "ALT O".						
55								
56		3. Other screens may be printed by holding down the "SHIFT" key						
57		and depressing "PrtSc". The printer will print what is						
58		shown on the screen.						
59								
60								
61		Press "PgUp" or "Alt M" for MENU						
62								
63								

	I	J	K	L	M	NO
4		Exogenous Variables				
5	INPUT		YR + 1	YR + 2	YR + 3	
6						
7						
8						
9	State Foundation		\$0	\$0	\$0	
10	Other State Rec.		\$0	\$0	\$0	
11						
12						
13	Local REAL tax receipts					
14	(Do not include Rollback and Homestead in these receipts.					
15	They will be forecasted as a % of Local REAL taxes)					
16		***ENTER PERCENT AS A DECIMAL***				0.00%
17	Local PERS PROP		\$0	\$0	\$0	
18	Other Local Rece		\$0	\$0	\$0	
19	Local Income Tax		\$0	\$0	\$0	
20						
21		PRESS "Alt M" FOR MENU				
22						
23						

	I	J	K	L	M	NO
24	INPUT ENROLLMENTS					
25	Note: Grade 1 enrollments are forecasted by birth rates and prior					
26	enrollments. Enter them here.					
27		No. of resident		1ST GRADE ENROLLMENTS		
28	Year	births		School	Enrollment on	
29	-----			Year	October 1	
30	9th yr prior-19*			-----		
31	-----			3rd year		
32	8th yr prior - *			prior		
33	-----			1985-1986	0	
34	7th yr prior - *			-----		
35	-----			2nd year		
36	6th yr prior - *			prior		
37	-----			1986-1987	0	
38	5th yr prior - *			-----		
39	-----			1st year		
40	4th yr prior - *			prior		
41	-----			1987-1988	0	
42	3rd year prior *PRESS "Alt M" FOR MENU OR					
43	PRESS "PgDn" FOR MORE ENROLLMENT INPUTS					

	I	J	K	L	M	NO
44	COHORT SURVIVAL MODEL					
45	HISTORICAL INPUTS					
46	Enrollment on October 1					
47	Grade	YR-3	YR-2	YR-1	Curr. Year	
48	Kindergarten	0	0	0	0	
49	Grade 1	0	0	0	0	
50	Grade 2	0	0	0	0	
51	Grade 3	0	0	0	0	
52	Grade 4	0	0	0	0	
53	Grade 5	0	0	0	0	
54	Grade 6	0	0	0	0	
55	Grade 7	0	0	0	0	
56	Grade 8	0	0	0	0	
57	Grade 9	0	0	0	0	
58	Grade 10	0	0	0	0	
59	Grade 11	0	0	0	0	
60	Grade 12	0	0	0	0	
61						
62						
63	Press "Alt M" for MENU					

	I	J	K
64	COHORT SURVIVAL MODEL		
65	OUTPUTS: SURVIVAL RATIOS		
66	Average survival ratios, based on the past three years, are shown.		
67	If you wish to change these ratios, press "PgDn".		
68			
69	Grade 1	$((M33/J30)+(M37/J32)+(M41/J34))/3$	
70	Grade 2	$((K50/J49)+(L50/K49)+(M50/L49))/3$	
71	Grade 3	$((K51/J50)+(L51/K50)+(M51/L50))/3$	
72	Grade 4	$((K52/J51)+(L52/K51)+(M52/L51))/3$	
73	Grade 5	$((K53/J52)+(L53/K52)+(M53/L52))/3$	
74	Grade 6	$((K54/J53)+(L54/K53)+(M54/L53))/3$	
75	Grade 7	$((K55/J54)+(L55/K54)+(M55/L54))/3$	
76	Grade 8	$((K56/J55)+(L56/K55)+(M56/L55))/3$	
77	Grade 9	$((K57/J56)+(L57/K56)+(M57/L56))/3$	
78	Grade 10	$((K58/J57)+(L58/K57)+(M58/L57))/3$	
79	Grade 11	$((K59/J58)+(L59/K58)+(M59/L58))/3$	
80	Grade 12	$((K60/J59)+(L60/K59)+(M60/L59))/3$	
81			
82	PRESS "PgDn" To Change Ratios OR Press "PgDn" twice for Forecasted		
83	Ratios OR Press "Alt M" for MENU		

	I	J	K	L	M
84	COHORT SURVIVAL MODEL				
85	CHANGE survival ratios, if desired. Enter Kindergarten estimates.				
86	If no changes are made, ratios shown will be used for forecasting.				
87	Make changes by positioning cursor over number to be changed,				
88	typing new ratio, and striking "return" or moving to another cell.				
89	Grade 1	+J69			
90	Grade 2	+J70			
91	Grade 3	+J71			
92	Grade 4	+J72			
93	Grade 5	+J73			
94	Grade 6	+J74			
95	Grade 7	+J75			
96	Grade 8	+J76			
97	Grade 9	+J77			
98	Grade 10	+J78			
99	Grade 11	+J79			
100	Grade 12	+J80			
101	Kindergarten enrollment estimates		YR+1	YR+2	YR+3
102			0	0	0
103	Press "Alt M" for MENU OR PgDn FOR FORECASTED ENROLLMENTS				

	I	J	K	L	M	NO
105	COHORT SURVIVAL MODEL					
106	OUTPUTS: FORECASTED ENROLLMENTS					
107		YR+1		YR+2	YR+3	
108	Kindergarten	+K101		+L101	+M101	
109	Grade 1	+J89*J38		+J89*K109	+J89*L109	
110	Grade 2	+J90*M49		+J90*K110	+J90*L110	
111	Grade 3	+J91*M50		+J91*K111	+J91*L111	
112	Grade 4	+J92*M51		+J92*K112	+J92*L112	
113	Grade 5	+J93*M52		+J93*K113	+J93*L113	
114	Grade 6	+J94*M53		+J94*K114	+J94*L114	
115	Grade 7	+J95*M54		+J95*K115	+J95*L115	
116	Grade 8	+J96*M55		+J96*K116	+J96*L116	
117	Grade 9	+J97*M56		+J97*K117	+J97*L117	
118	Grade 10	+J98*M57		+J98*K118	+J98*L118	
119	Grade 11	+J99*M58		+J99*K119	+J99*L119	
120	Grade 12	+J100*M59		+J100*K120	+J100*L120	
121	TOTAL					
122	ENROLLMENT	@SUM(K120..K109)+(0.5*K108)		@SUM(L120..	@SUM(M120..	
123	Kindergarten added @ 50%			Press "Alt M" for Menu		
124						

	P	Q	R	S	T	U	V
4	INPUT PPVs	***ENTER DOLLAR FIGURES			YR + 1	YR + 2	YR + 3
5	STAFFING PPVs	WITHOUT ", "OR".***			***ENTER PERCENTS AS DECIMALS***		
6	Increment/Grad Credit %				0.0%	0.0%	0.0%
7	Prfd Pupil/Teacher Ratio				0.0%	0.0%	0.0%
8	No. teachers above ratio				0	0	0
9	Administration Increase/Decrease				\$0	\$0	\$0
10	Classified Increase/Decrease				\$0	\$0	\$0
11	Other Pers. Costs, subs, supp.contr.,etc				\$0	\$0	\$0
12	New Taxes				\$0	\$0	\$0
13	Cert Salary Increase				0.0%	0.0%	0.0%
14	Class S&W Increase				0.0%	0.0%	0.0%
15	Earnings Rate				0.0%	0.0%	0.0%
16	Fringe Benefits % S&W				0.0%	0.0%	0.0%
17	Cost of Buses				\$0	\$0	\$0
18	State pays % buses				0.0%	0.0%	0.0%
19	Other Capital Purchases				\$0	\$0	\$0
20	Purchased Services				0.0%	0.0%	0.0%
21	Materials & Supp.				0.0%	0.0%	0.0%
22	Inc/Dec Other Expend. including Interest				\$0	\$0	\$0
23	Press "PgDn" (or "Alt M" for Menu)				OR "ALT L" FOR OUTPUTS		

	P	Q	R	S	T	U	V
24	SUMMARY OF STAFF HISTORICAL DATA					Current	
25	INPUT STAFF FINANCIAL DATA					Year	
26	Teachers					\$0	
27	Administration					\$0	
28						-----	
29	Total Certified Costs					\$0	
30	Classified					\$0	
31	Other Personnel Costs (Supp. Contracts,etc.)					\$0	
32	Total Personal Costs					\$0	
33							
34	Number of teachers					0	
35							
36							
37							
38							
39							
40							
41							
42							
43							

Press "Alt M" for MENU

	P	Q	R	S	T	U	V
44	INPUT HISTORICAL FINANCIAL DATA - RECEIPTS						Current
45						YR-3	YR-2
46	Revenue Receipts					YR-1	year
47	Local						(APPROPRI- ATIONS)
48	Real Estate Tax					\$0	\$0
49	Personal Prop Tax					\$0	\$0
50	Income Tax Receipts					\$0	\$0
51	Investment Income					\$0	\$0
52	Other Local					\$0	\$0
53	State					\$0	\$0
54	Foundation					\$0	\$0
55	Rollback & Homestd					\$0	\$0
56	Other State					\$0	\$0
57	Federal					\$0	\$0
58	Total-Rev Receipts					\$0	\$0
59							
60							
61							
62							
63							

Press "PgDn" to enter Expenditures
OR Press "Alt M" for MENU

	P	Q	R	S	T	U	V	
				YR-3	YR-2	YR-1	Current	
64	INPUT EXPENDITURES							
65	Salaries-Cert							\$0
66	Salary/Wages Class							\$0
67	Other personnel costs							\$0
68	Total Salaries & Wages							\$0
69	Fringe Benefits							\$0
70	Purchased Services							\$0
71	Materials, Supplies							\$0
72	Capital Outlay + Buses							\$0
73	Other (inc. interest)							\$0
74								
75	Operating-Expenditures							\$0
76	Receipts Over/Under							\$0
77	Beginning Balance 7/1							\$0
78								
79								
80	CASH BALANCE							\$0
81								
82								
83								

Press "Alt M" for MENU

W	X	Y	Z	AA	AB
44	OUTPUT - FINANCIAL PLAN - RECEIPTS				
45		YR + 1		YR + 2	YR + 3
46	Revenue Receipts				
47	Local				
48	Real Estate Tax	+K13		+L13	+M13
49	Personal Prop Tax	+K17		+L17	+M17
50	Income Tax Receipts	+K19		+L19	+M19
51	Investment Income	+T15*(V77+V58)		+U15*(Z58+Z77)	+V15*(AA58+AA77)
52	Other Local	+V52+K18		+Z52+L18	+AA52+M18
53	State	(T17*T18)		(U17*U18)	(V17*V18)
54	Foundation	+K9		+L9	+M9
55	Rollback & Homestd	+Z48*\$M\$16		+AA48*\$M\$16	+AB48*\$M\$16
56	Other State	(T18*T17)+K10		(U18*U17)+L10	(V18*V17)+M10
57	Federal				
58	Total-Rev Receipts	@SUM(Z48..Z57)		@SUM(AA48..AA57)	@SUM(AB48..AB57)

59
60
61
62
63

Press "PgDn" for Financial Plan Expenditure Outputs
(or "Alt M" for Menu)

W	X	Y	Z	AA	AB
64	OUTPUT EXPENDITURES				
		YR + 1		YR + 2	YR + 3
65	Salaries-Cert	(Z28+Z38)*(1+T13)+T		(Z65+AA38)*(1+U6)*(1+U13)	(AA65+AB38)*(1+V6)*(1+V13)
66	Salary/Wages Class	(Z29+T10)*(T14+1)		(AA29+U10)*(U14+1)	(AB29+V10)*(V14+1)
67	Base Increase & Other Pers	(Z65*T13)+(Z66*T14)		(AA65*U13)+(AA66*U14)+U11	(AB65*V13)+(AB66*V14)+V11
68	Total Salaries & Wages	@SUM(Z65..Z67)		@SUM(AA65..AA67)	@SUM(AB65..AB67)
69	Fringe Benefits	+T16*Z68		+U16*AA68	+V16*AB68
70	Purchased Services	+V70*T20+V70		+Z70*U20+Z70	+AA70*V20+AA70
71	Materials, Supplies	(V71*T21)+V71		(Z71*U21)+Z71	(AA71*V21)+AA71
72	CapSame+Bus	+T19+T17		+U19+U17	+V19+V17
73	Other (including interest)	+V73+T22		+Z73+U22	+AA73+V22
74					
75	Operating-Expenditures	@SUM(Z73..Z68)		@SUM(AA73..AA68)	@SUM(AB73..AB68)
76	Receipts Over/Under	+Z58-Z75		+AA58-AA75	+AB58-AB75
77	Beginning Balance 7/1	+CBCURR		+CB+1	+CB+2
78					
79					
80	CASH BALANCE	+Z76+Z77		+AA76+AA77	+AB76+AB77

81
82
83

Press "PgDn" for Summary of Important Outputs
(or "Alt M" for Menu)

	W	X	Y	Z	AA
84	SUMMARY OF IMPORTANT OUTPUTS				
85					
86					
87			YR + 1	YR + 2	YR + 3
88					
89	CASH BALANCE 6/30		+CB+1	+CB+2	+CB+3
90	*****				
91					
92	Total-Rev Receipts		+Z58	+AA58	+AB58
93	Total-Expenditures		+Z75	+AA75	+AB75
94	Rec Over/Under Disbursement		+Z76	+AA76	+AB76
95					
96					
97					
98					
99	Press "Alt E" to Change PPV.s				
100	(or Press "Alt M" for Menu)				
101	If Cash Balances are satisfactory, press "PgUp" twice for Financial				
102	Plan Receipts or once for Financial Plan Expenditures. Go to the Print				
103	Menu if you would like a print out				

	AC	AD	AE	AF	AG	AH
4	** MACROS **					
5	Go to take-on screen Go to Menu Menu Macros					
6				A	B	C
7	{goto}a1~		{goto}a1~	{goto}	{goto}	{goto}
8			{goto}a21~	{name}	{name}	{name}
9				INPUTEXOGEN~	INPUTENROLL~	COHORTRATIOS~
10						
11						

	AI	AJ	AK	AL	AM
4					
5					
6	D	E	F	G	H
7	{goto}	{goto}	{goto}	{goto}	{goto}
8	{name}	{name}	{name}	{name}	{name}
9	FCASTENROLL~	INPUTPPVS~	INPUTHPDATA~	INPUTFRDATA~	INPUTFEDATA~
10					
11					

	AN	AO	AP	AQ	AR	AS
4						
5						
6	I	J	K	L	P	
7	{goto}	{goto}	{goto}	{goto}	/PPRFCASTREC~	
8	{name}	{name}	{name}	{name}	OML4~MR150~MT2~MB2~	
9	STAFFOUTPUT~	FCASTREC~	FCASTEXP~	SUMMARY~	P66~QG	
10						LLLLRFCASTEXP~GPQ
11						

	AT	AU	AV	AW	AX	AY	AZ
4							
5							
6	O		Q	S			
7	/PPRINPUTFRDATA~		/Q	/FSTESTMODEL~	R		
8	OML4~MR150~MT2~MB2~						
9	P66~QG						
10	LLLLRINPUTFEDATA~	GPQ					
11							

BIBLIOGRAPHY

- Adams, C. F., Jr. & Crampton, F. E. (1983). The fiscal impact of state aid to local schools. *Journal of Educational Finance*, 9(2), 157-170.
- Adams, E. K. (1980). *Fiscal response and school finance simulation: A policy perspective*. (Report No. F80-3). Denver, CO: Education Commission of the State. Education Finance Center.
- Baker, R. T. (1987). *Handbook of Ohio school law*. Reprinted from text of Baker's *Ohio school law guide*. Cincinnati, OH: Anderson.
- Bell, T. H. (1988, February). Parting words of the 13th man. *Phi Delta Kappan*, 400-407.
- Bloomfield, S. D. & Updegrove, D. A. (1981). Modeling for insight, not numbers. *New Directions for Higher Education: Management Science Application to Academic Administration*, 35, 93-104.
- Brandt, J. M. (1986). Ohio school financial handbook (rev.) based on R. G. Stabile & P. E. Spayde, *What every Ohio citizen should know about school finance*. Westerville, OH: Ohio School Boards Association.
- Brazaitis, T. J. (1988, February 26). Bennett says schools lacking. *The Plain Dealer*, 13-A.
- Bromiley, P. & Euske, K. J. (1986). The use of rational systems in bounded rationality organizations: A dilemma for financial managers. *Financial Accountability and Management*, 2(4), 311-320.
- Brooke, M. Z. (1984). *Centralization and autonomy, A study in organization behaviour*. London: Holt, Rinehart and Winston.

Brown v. Board of Education of Topeka, 347 U.S. 483 (1954).

Budget Document. (1988). Unpublished 1988-1989 budget. OR: Beaverton School District No. 48J.

Campbell, R. F., Cunningham, L. L., Nystrand, R. O., & Usdan, M. D. (Eds.). (1975). *The organization and control of American schools*, (3rd ed.). Columbus, OH: Charles E. Merrill.

Cardinale, O. (1981). On a generic management information system model with applications to public school systems. *Dissertation Abstracts International*, (University Microfilms No. AAD82-03949).

Caruthers, J. K. (1981). Strategic master plans. *New Directions for Institutional Research, Evaluation of Management and Planning Systems*, 31, 17-27.

Chambers, J. G. (1975). *A model of resource allocation in public school districts: a theoretical and empirical analysis*. Unpublished paper based on the author's PhD dissertation. Department of Economics, Stanford University. (ERIC Document Reproduction Service No. ED 123718).

Cheit, E. F. (1977). Challenges inherent in the systematic approach. *New Directions for Institutional Research*, 15, 57-78.

Christman, L. H. (1982). *Streamlining local school budgeting in Ohio*. Cleveland, OH: Citizens' Council for Ohio Schools. (ERIC Document Reproduction Service No. Ed 233 457).

Cibulka, J. G. (1987). Theories of educational budgeting: Lessons learned from the management of decline. *Educational Administration Quarterly*, 23(1), 7-40.

Clark, D. L. (1981). In consideration of goal-free planning systems in education. *Educational Administration Quarterly*, 17(3), 42-60.

- Cohen, M. C. (1983). Tax capacity, tax effort, and state funding of schools in Ohio. *Journal of Educational Finance*, 9(2), 141-156.
- Cohn, E., & Millman, S. D. (1975). *Input-output analysis in public education*. Cambridge, MA: Ballinger
- Colton, D. L. (1977). *Urban school desegregation costs part I, case studies*. St. Louis, MO: Center for Educational Field Studies. (ERIC Document Reproduction Service No. Ed147972).
- Costs per pupil*. (1986). Columbus, OH: Department of Education, Division of Computer Services and Statistical Reports.
- Cuthbert, R. (1981). Developing a corporate strategy for college management, *Coombe Lodge Report*, 14, No. 4, 223-233. (From *School Organization & Management Abstracts*, 1982, 1, No. 8.)
- Cyert, R. M. (1981). Management science and university management. *New Directions for Higher Education: Management Science Application to Academic Administration*, 35, 27-40.
- Davis, O. A., Dempster, M. A. H., & Wildavsky, A. (1966). A theory of the budgetary process. *The American Political Science Review*, XL(3), 529-547.
- Dembowski, F. L. (1981). An inventory-theoretic approach to school district cash management. *Educational Administration Quarterly*, 17(1), 91-106.
- Five year plan 1987 - 1992*. (1987). Unpublished document. North Royalton, OH: North Royalton City Schools.
- Gillenson, M. L. & Goldberg R. (1984). *Strategic planning, systems analysis, and database design*. New York: John Wiley & Sons.
- Gist, J. R. (1976). "Stability" and "competition" in budgetary theory. *American Political Science Review*, 76, 859-872.

- Glose, G. P. (1977). A long range financial planning/forecasting model for local school districts. *Dissertation Abstracts International*, (University Microfilms No. AAD78-14000).
- Glover, R. H. & Holmes, J. (1983). Assessing the external environment. In N. P. Uhl (Ed.) *Using Research for Strategic Planning* (pp. 7-18). *New Directions for Institutional Research*, 37. San Francisco: Jossey-Bass.
- Graff, L. M. (1988). *A financial planning model for school districts in the United States - a literature survey*. Discussion Paper No. 67. (Available from Accountancy Department, Massey University, Palmerston North, New Zealand).
- Grafton, C. & Permaloff, A. (1985). Budget implementation with microcomputers. *Public Productivity Review*, 20, Summer/Fall, 202-212.
- Harris, D. E. (1983). *Representations of a harsh reality: The use of computer planning models in higher education*. Unpublished PhD thesis, Claremont Graduate School.
- Hirshfeld, D. S. (1984). An overview of mathematical programming for strategic planning. In T. H. Naylor & C. Thomas (Eds.), *Optimization Models for Strategic Planning*. (pp.121-137). Amsterdam: Elsevier Science.
- Hopkins, D. S. P. & Massy W. F. (1981). *Planning models for colleges and universities*. Stanford, CA: Stanford University Press.
- Iannaccone, L. & Lutz, F. W. (1970). *Politics, power and policy: The governing of local school districts*. Columbus, OH: Charles E. Merrill.
- Johnson, H. (1988, February 26). States' progress in public education slows down. *USA Today*, p. 1A, 5D.
- Jones, C. S. (1986). Universities, on becoming what they are not. *Financial Accountability and Management*, 2(2), 107-119.

- Jones, K. M. (1984). Implementing optimization in a decision support system. In T. H. Naylor & C. Thomas (Eds.), *Optimization Models for Strategic Planning*. (pp. 169-173). Amsterdam: Elsevier Science.
- Jordan, K. G. & Webb, L. D. (1986). School business administration. *Educational Administration Quarterly*, 22(3), 171-199.
- Jordon, L. G., & Weaver, J. L. (1972). *Planning-programming-budgeting concepts applied to public school district financial management* (Order No. AD-741-409). Springfield, VA: National Technical Information Service (ERIC Document Reproduction Service No. ED0668 15).
- Kami, M. J. (1979). *Managing the future*. Lighthouse Point, FL: Corporate Planning.
- Kee, J. & Black, R. (1985). Is excellence in the public sector possible? *Public Productivity Review*, Spring, 25-32.
- Kirschling, W. R. (1976). Models: Caveats, reflections and suggestions. *New Directions for Institutional Research*, 9, 1-11.
- LaMorte, M. W. & Williams J. D. (1985). Court decisions and school finance reform. *Educational Administration Quarterly*, 21(2), 59-89.
- Lee, R. (1982). *Financial and staffing ratio analysis: Predicting fiscal distress in school districts*. Unpublished doctoral dissertation, Ohio State University.
- Lewis, J., Jr. (1983). *Long-range and short-range planning for educational administrators*. MA: Allyn and Bacon.
- Lynch, R. M. & Williamson, R. W. (1983). *Accounting for management*. New York: McGraw-Hill.
- Martin, D. B. (1987). *Long range planning for school districts*. Westerville, OH: Ohio School Boards Association.

- Martz W. M. & Kami, M. J. (1981). *Corporate planning*. Lighthouse Point, FL: Corporate Planning.
- Matthews, K. M. & Holmes C. T. (1984). Implications of regional cost adjustments to school finance plans. *Educational Administration Quarterly*, 20(1), pp. 69-92.
- McCorkle, Jr., C. O. (1977). Information for institutional decision making. *New Directions for Institutional Research*, 15, 1-10.
- Michaelsen, J. B. (1981). The political economy of school district administration. *Educational Administration Quarterly*, 17(3), 98-113.
- Milner, R. G. & Rohrbaugh, J. (1985). Microcomputers and strategic decision making. *Public Productivity Review*, 20, Summer/Fall, 175-189.
- Minneapolis Public Schools. (1982). *Five year plan for the Minneapolis public schools, 1982-1987*. Minneapolis, MN: Author. (ERIC Document Reproduction Service No. ED242817).
- Minneapolis Public Schools. (1983). *Minneapolis five year plan update, 1983-1984*. Minneapolis, MN: Author. (ERIC Document Reproduction Service No. ED242818).
- Mitchell, D. E. (1984). Educational policy analysis: The state of the art. *Educational Administration Quarterly*, 20(3), 129-160.
- Monk, D. H. (1984). The conception of size and the internal allocation of school district resources. *Educational Administration Quarterly*, 20(1), 39-67.
- National Education Association. (1984). *Estimates of school statistics, 1983-84 as provided by the state departments of education*. Washington, D. C.: Author, Research Division.

- National School Board Association. (1988). Money still is your top problem, but curriculum is making a big comeback. *American School Board Journal*. Washington, D. C.: Author.
- Naylor, T. H. & Thomas, C. (Eds.). (1984). *Optimization models for strategic planning*. B. V. Dean (Ed.), *Studies in Management Science and Systems*, 10.
- Nelson D. L. & Purdy, W. M. (1974). *School Business Administration*. Lexington, MA: D. E. Heath.
- Ohio Education Association. (1988, February). In support of increased State funding of schools (Advertisement). Cleveland, OH: *The Plain Dealer*.
- Pipho, C. (1988, February). Urban school districts and state politics. *Phi Delta Kappan*, pp. 398-399.
- Plourde, P. J. (1976). Institutional use of models: Hope or continued frustration? *New Directions for Institutional Research*, 9, 17-33.
- Pratt, M. J. (1985). *Computerized support for financial planning in South African universities*. Unpublished doctoral dissertation, University of South Africa.
- Pratt, M. J. (1986). *What are decision support systems?* Discussion Paper Series No. 51. (Available from Accountancy Department, Massey University, Palmerston North, N.Z.).
- Rege, U. P. (1986). Planned incremental package evaluation system. *Financial Accountability & Management*, 2(1), 25-34.
- Reynolds, D. (1982). School effectiveness research: A review of the literature. *School Organization & Management Abstracts*, 1, 5-15.
- Sandin, R. T. (1977). Information Systems and Educational Judgement. *New Directions for Institutional Research*, 15, 19-27.

San Antonio Independent School District v. Rodriguez, 411 U.S.1 (1973).

Serrano v. Priest, 5 Cal.3d 584, 487 P.2d 1241 (1971).

Shapiro, J. F. (1984). Practical experience with optimization models. In T. H. Naylor & C. Thomas (Eds.), *Optimization Models for Strategic Planning*. (pp. 67-77). Amsterdam: Elsevier Science.

Smith, K. (1985). *Forecasting school district fiscal health*. Unpublished doctoral dissertation, Ohio State University.

Smith, K. (1986). Forecasting school district fiscal health. Dissertation research. *Journal of Education Finance*, 12(1), 140-153.

Tanner, C. K. (1971). *Designs for educational planning*. Lexington, MA: D. C. Heath.

Thompson, A. A., Jr., & Strickland, A. J., III (1984). *Strategic management: Concepts and cases* (3rd ed.). Plano, TE: Business Publications.

Tierney, M. L. (1981). Priority setting and resource allocation. *New Directions for Institutional Research: Evaluation of Management and Planning Systems*, 31, 29-41.

Tutela, A. D. (1988, February 15). Task undone, What Cleveland schools will have to tackle next. *The Plain Dealer*, p. 11-A.

Uhl, N. P., (1978). A case study of goals-oriented research. *New Directions for Institutional Research: Using goals in research and planning*, 19, 61-77.

Updegrave, D. A. (1981). Using computer-based planning models. *New Directions for Institutional Research: Evaluation of Management and Planning Systems*, 31, 61-69.

- Van Dusseldorp, R. A. , Richardson, D. E., Foley, W. J. (1971). *Educational decision-making through operations research*. Boston, MA: Allyn and Bacon.
- Wacht, R. F. (1984). *Financial management in nonprofit organizations*. Atlanta, GA: Georgia State University.
- Walter, F. B. (1988, February 15). Only Cleveland can solve Cleveland's problems. *The Plain Dealer*, p. 11-A.
- Whetten, D. A. (1981). Organizational responses to scarcity: Exploring the obstacles to innovative approaches to retrenchment in education. *Education Administration Quarterly*, 17(3), 80-97.