

CRITICAL APPRAISAL OF BONDING PRACTICES IN
MICHIGAN PUBLIC SCHOOLS

Thesis for the Degree of Ed. D.
MICHIGAN STATE UNIVERSITY
Leslie Fenner Greene

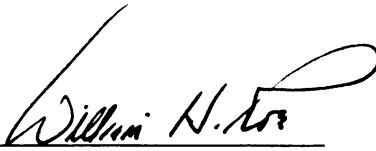
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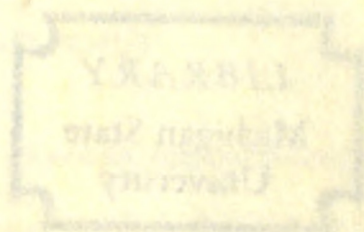
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CRITICAL APPRAISAL OF BONDING
PRACTICES IN MICHIGAN PUBLIC SCHOOLS



By

Leslie Fenner Greene

A Thesis

Submitted to the College of Education
Michigan State University of Agriculture and
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the requirements for the degree of

DOCTOR OF EDUCATION

Department of Administration and Educational Services

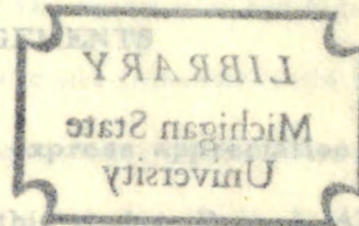
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CRITICAL APPRAISAL OF BONDING

PRACTICES IN MICHIGAN PUBLIC SCHOOLS

ACKNOWLEDGEMENTS



Beegle, Carl Gross, C. V. Millard, and Harry Sundell.

By

Leslie Fenner Greene

Caroline Thrun, school bond attorney of Lansing, were

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ABSTRACT

The increasing number of bond issues facing Michigan public schools necessitates a study of the history of Michigan

ACKNOWLEDGEMENTS

school bonding, the factors affecting the net interest costs of bonds, and the The writer wishes to express appreciation for current the help received in making this study. Drs. J. Allan

Beegle, Carl Gross, C. V. Millard, and Harry Sundwall

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ings; (2) and constructive criticisms. Special acknowledgement

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costs; for his encouragement, guidance, and inspiration.

lated to Gladys Sibley of the Municipal Advisory Council and

Caroline Thrun, school bond attorney of Lansing, were

ship is particularly helpful in providing material and suggest-

any others. Numerous others contributed in many ways and it

is extremely provided assistance that was invaluable in completing

manifest this study. It affect bond issues: (1) of the history of

cost by Methods, techniques, and data. The writer investigated

materials and records from the Municipal Finance Commission,

Municipal Advisory Council, bonding companies, and bonding

attorneys such as Berry, Stevens and Moorman, and Miller.

Canfield, Paddock and Stone.

ABSTRACT

Information was obtained from libraries relative to

The increasing number of bond issues facing Michigan public schools necessitates a study of the history of Michigan school bonding, the factors affecting the net interest costs of bonds, and the effect of the 1955 Constitutional Amendment upon current and potential bond issues.

Statement of the problem. The purpose is: (1) to relate the legal-historical background of Michigan public school bond-ings; (2) to determine the characteristics of Michigan school bonds; (3) to determine the factors that affect the net interest costs; and (4) to determine the status of school bonding as related to the 1955 Constitutional Amendment.

Importance of the study. The increasing school membership is providing the need for more potential bond issues than any other era in our history. In view of this potential demand, it is extremely important that school districts be cognizant of the manifestations that affect bond issues.

Methods, techniques, and data. The writer investigated materials and records from the Municipal Finance Commission, Municipal Advisory Council, bonding companies, and bonding attorneys such as Berry, Stevens and Moorman; and Miller,

Canfield, Paddock and Stone, while others such as percentage of

affirms Information was obtained from libraries relative to

material already published on the subject. department of Public In-

struction Factor analyses were utilized to formulate specific develop-

principles that had a bearing upon school bond issues. those

factors Conclusion. Michigan is providing only lip service to the

concepts that every child is entitled to equal educational oppor-

tunity, and that education is a function of the state. Bond laws and

have completely ignored the financial inequities between districts,

and have developed as a series of expedient enactments closely

allied to temporary economic conditions. The Thirteen Mill re-

Amendment is no exception. It provides for extension of credit,

but does not entirely solve the school bond problem. made to deter-

mine if The study of bond issues revealed that boards of education

too often fail to provide sufficient latitude within the bond issue

for board decision making subsequent to the acceptance of the

bond proposition by popular vote. The provision for this latitude

has little or no affect upon the percentage of affirmative votes

cast by the public for the bond issue.

It was found that certain conditions related to the bond

issue, such as percentage of tax collections, debt to valuation

ratios, and the percentage of callable bonds within the issue,

affected the net interest cost, while others such as percentage of affirmative popular vote had little or no measurable effect.

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Recommendations. 1. That the Department of Public Instruction publish a handbook containing the procedure for developing and marketing a bond issue, and it should describe those factors that have a definite effect upon the net interest cost.

2. That a further study be made at a later date to determine the full impact of the Thirteen Mill Amendment upon the bond program.

3. That a further study be made to determine the psychological impact of the public toward the public schools, resulting from the increased tax burden for school construction.

4. That a study of Michigan tax structure be made to determine if a revision of tax laws would result in a more favorable bond interest rate for Michigan schools.

5. That a study be made of the possibility of developing a state revolving fund as a more equitable and feasible means of financing needed school facilities.

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¹ Every Week, (Columbus, Ohio) Vol. XXII, No. 34
November 28, 1955, p. 82.

² Loc. cit.

million children are on half days or swing shift sessions.³ The

CHAPTER I

November, 1955, Washington White House conference listed the

shortage of school classrooms. **INTRODUCTION** the major crisis facing the

American public. The perusal of almost any current publication

The people of the United States are faced with the greatest reveals an article pertaining to the need for additional classrooms, school building program in the history of the country. The national The need is so urgent that it has been termed by many distinguished population is currently increasing at the rate of 7,300 people per authors as "Today's Crisis in Education".

day. Added to the high birth rate is the decreased percentage of

Michigan is not exempt from the national problem. The school drop outs. In 1900, only five out of 100 students entering state enrollment in public schools has increased from 946,827 in the fifth grade stayed on to graduate from high school; whereas, 1945 to 1,296,558 in 1955.⁴ By 1960, an estimated 1,636,603 fifty-four out of 100 now finish high school.¹ On this basis it is students will register for an education in our schools. This will be a reasonable assumption that in the future a still higher percentage a gain of over 73 per cent since 1945-6, a period of only fifteen will remain in school until graduation. The current school popula- years.⁵ Michigan's problem is becoming increasingly acute. Many tion of thirty-seven million children is expected to increase to school districts that have previously erected new structures find approximately forty-eight million by 1965.²

that they are not sufficiently large to house the increasing enrollment.

Today, schools are in need of approximately one hundred High school districts as well as cities have developed in areas that twenty thousand more classrooms. It is estimated that at least were entirely undeveloped a decade ago. Even the relatively small, three million, five hundred thousand children are receiving inadequate education because of poor school facilities. More than a half a

³ Every Week, loc. cit.

⁴ Table II, Appendix.

¹ Every Week, (Columbus, Ohio) Vol. XXII, No. 11 November 28, 1955, p. 82. Michigan Public School Facilities Needs, (Department of Public Instruction School Facilities Survey, 1954), p. 27.

² Loc. cit.

million children are on half days or swing shift sessions.³ The November, 1955, Washington White House conference listed the shortage of school classrooms as one of the major crises facing the American public. The perusal of almost any current publication reveals an article pertaining to the need for additional classrooms. The need is so urgent that it has been termed by many distinguished authors as "Today's Crisis in Education".

Michigan is not exempt from the national problem. The state enrollment in public schools has increased from 946,627 in 1945 to 1,296,558 in 1955.⁴ By 1960, an estimated 1,636,608 students will register for an education in our schools. This will be a gain of over 73 per cent since 1945-6, a period of only fifteen years.⁵ Michigan's problem is becoming increasingly acute. Many school districts that have previously erected new structures find that they are not sufficiently large to house the increasing enrollment. High school districts as well as cities have developed in areas that were entirely undeveloped a decade ago. Even the relatively small, need. The school district then is confronted not only with the need

3 Every Week, loc. cit.

4 Table II, Appendix.

5 Clair L. Taylor, Michigan Public School Building Needs, (Department of Public Instruction School Facilities Survey, 1954), p. 27.

remote, rural areas have not entirely escaped the effect of increasing school population and the resultant need of increased school facilities.

There are two general approaches to raising funds for this large. An increase of approximately seventy thousand pupils per year in the Michigan public schools during the immediate future establishes without doubt the fact that new structures must be erected. The erection of these needed structures involves enormous capital outlays. The capital outlay becomes even greater because casual observance reveals that there is a direct relationship between the economic cycles and the birth rate. That is, there exists a parallel between the need for additional school facilities and the cost of the construction of those facilities.

Neither boards of education nor administrators have been very successful in obtaining permission of the electorate to erect new building facilities prior to the actual impact of increased enrollment. The general pattern, on the contrary, is that the electorate will support the building program only following the experienced need. The school district then is confronted not only with the need for additional facilities, but also the problem of paying a relatively high dollar for value received.

School districts are relatively helpless in controlling socio-economic cycles and the corresponding building needs and costs.

They can erect less expensive buildings, but they can not change the building index costs. There are two general approaches to raising funds for this large capital expenditure. A district may be so fortunate as to have a taxable base sufficient to provide new school facilities on a payable-as-you-go basis. Unfortunately, most school districts do not enjoy this enviable position, and are forced to obtain revenue through the sale of bonds. Such bonds constitute a lien upon the school district for a specified number of years. The "bonded" (school district) agrees to repay the principal, as well as the interest charged on the principal, according to the requirements provided in the issue. It becomes extremely important then, that the bond issue contain those provisions that make it most advantageous to both the buyer and the seller of the bonds. Such mutually beneficial provisions are not limited solely to those conditions that exist at the time of sale, but should also predicate any economic condition that might present itself during the life of the issue. No one can predict accurately what the economic picture will be ten, fifteen, or fifty years from today, nor is it the purpose of this study to attempt to do so. However, it has been observed that if, in the past, additional precautions had been taken and

a more thorough analysis made, bond issues could have been provided that would have been more beneficial to the school program and the school district.

It has been observed that school districts utilize a multitude of methods in developing bond issues, and that there exists a considerable degree of variance in these bond issues. Some school districts receive favorable interest rates, while others pay considerably higher interest rates. Although the economic variables greatly influence the bond interest rates, it is reasonable to assume that not all of the difference in rates is the result of these variables. Some of the variance is the result of the manner in which the bond issue is framed.

Closely allied to interest rates is the flexibility of the issue itself. No school district can foresee all of the intangibles that may or may not present themselves during the interim that the issue is in effect. School district profiles are constantly being modified or changed in some way. An issue that may appear to be plausible today, may prove to be somewhat impractical within as short a period as two or three years. A school district, therefore, should be aware of the possible pitfalls in formulating a bond issue. Further, a district should provide as many foreseeable alternatives as possible, thereby providing insurance under varying circumstances for the most feasible means of retiring the obligations.

In Michigan, the ability of a school district to build school buildings is dependent on the total value of real and personal property in the district, the amount of building funds on hand, and the existing capital outlay indebtedness.⁶

Even though the state as a whole showed an ability equal to 151 per cent of the total school construction need, and a surplus of 381,000,000 dollars, the situation in many of Michigan's school service areas is financially unfavorable for new bond issues.⁷ The Department of Public Instruction School Facilities Survey reported that one hundred seventeen service areas, or 22 per cent of the 524 reporting districts, showed building needs in excess of ability.⁸ The condition has been rectified in part by the adoption of a Constitutional Amendment which facilitates the ability of many a school district to obtain needed funds for school housing.⁹ The 117 districts are now able to extend their credit sufficiently to meet the building need.

The role of the school bond, however, has by no means diminished as an aftermath of the adopted amendment. Instead, the need for better understanding of factors involved in school bonding is

expedient enactments, closely allied to temporary emergency conditions, ⁶ Ibid., pp. 27-9.

⁷ Ibid., p. 32.

⁸ Loc. cit. 1955 Constitutional Amendment providing for

⁹ State Constitution of Michigan, Section X, Article 27. be

of greater significance than ever before.

The fact that it is now possible to bond and tax a school district for a period of thirty years, intensifies the need for a study of the ramifications that effect the subsequent cost of a bond issue.

This study, a critical appraisal of bonding practices in Michigan public schools, is based on the following hypotheses:

I. THE PROBLEM

1. That certain factors related to the bond issue affect the average net interest cost of the issue.
2. That bond issues often are not provided with sufficient flexibility to adapt to the ever changing socio-economic conditions.
3. That the failure of the school district to provide bond issues in light of the preceding hypotheses can result in inconveniences as well as financial loss to the school district.
4. That every district, due to its own variables, should provide its individual bond issue. However, there are certain factors that are applicable, in a degree, to every school bond issue.
5. Michigan school bond laws have developed as a series of expedient enactments, closely allied to temporary economic conditions, rather than as a result of adequate research and far-sighted planning.
6. That the 1955 Constitutional Amendment provides new avenues of approach to the bonding problem that may or may not be

beneficial to every school district in the state.

7. That revision or change in the bonding laws of the State of Michigan could improve the school district's ability to provide the necessary housing for school children on a more equitable basis.

I. THE PROBLEM

Statement of the problem. It is the purpose of this study:

(1) to relate the legal-historical background of Michigan public school bondings; (2) to determine the general characteristics of Michigan school bonds and the effects of those characteristics as related to the school board, the public, and the bond buyers; (3) to determine the factors that affect the net interest costs of the bond issues; (4) to determine the status of school bonding as related to the 1955 Constitutional Amendment.

Importance of the study. The State of Michigan is faced with a tremendous school building program. It is generally agreed that pay-as-you-go is generally the best and most acceptable program. However, most school districts are in the financial position that it is either impossible or impractical to build without the issuance of bonds for the purpose of raising construction funds.

The magnitude of the present bonding programs is revealed July 1, 1954, to July 1, 1955, Research Department, Michigan by the number of recently approved bond issues. The Michigan

Municipal Finance Commission approved bond issues in the amount of \$345,888,030 in the period of January 1, 1950, to July 1, 1955. Of this amount there were 210 issues approved in the amount of \$74,772,325 from July 1, 1954, to July 1, 1955.¹⁰ The November issue of the American School Board Journal reveals that in the single month of August there were \$8,165,000 in school bonds sold in the state of Michigan. The diversification in the amount of the issues, length of maturity, and rates of interest, implies that there exists a multitude of possibilities in providing and marketing a bond issue. The bonds approved in the fiscal year ending July 1, 1955,¹¹ varied in amounts from \$3,150 to \$7,250,000. Maturities ranged from two years to 25 years, and interest rates differed from a low of 1 1/2 per cent to a high of 4 per cent. The variance in interest rates among issues of similar nature and physical qualities suggests that, in addition to the bond market, there exists criteria that has a direct effect upon the interest rate. In addition to the need for providing the most favorable borrowing is a widespread practice.

¹⁰ Municipal Finance Commission files, Lansing, Michigan.

¹¹ Bond issues approved by Municipal Finance Commission, July 1, 1954, to July 1, 1955, Research Department, Michigan Education Association.

interest rates possible under the existing circumstances at the time the bonds are issued, there are other important criteria to be examined such as the tax levy necessary to meet obligations, length of issue, type of bond, and particularly the flexibility of the issue.

The profile of a district is in a constant state of flux. Economic cycles do occur, and if the issue is not sufficiently flexible, the effect of the bond issue could conceivably range from hardship to disaster. The converse could likewise have a serious effect. The 1950's have been a relatively prosperous period in Michigan history. The growth of expenditures has resulted in approximately the doubling of property tax. School districts that failed to foresee and provide for this change in property valuations and expanded growth, and did not provide for flexibility within the bond issue to provide for such economic change, wrought a hardship to the community and the educational program. The variety of situations, rates, types of bonds, relative infancy of the school bond program, and number of court decisions, all bear testimony to the fact that far too little is known about the subject by school officials, even though public school borrowing is a widespread practice.

There has not been any research in the field of recent and current school bond practices in the state of Michigan. It was, therefore, advisable to make a study of previous issues as a means

of determining some of the practices, and the resultant effects of those practices. The results of such findings could provide suggested criteria for the improvement of future bond issues. It is believed that this study can provide valuable information and data that will aid school districts in analyzing their particular bond issues, and thereby provide the necessary facilities at a reduced cost and without curtailment of the educational program.

Limitation of the study. A complete appraisal of school bonding practices and the effects of these practices, involves many facets. A study of all these factors and the subsequent findings would be too involved, too complex, and too difficult a task to combine in one study. Therefore, the study is limited to four facets of bonding practices in Michigan (1) historical background, (2) latitude provided boards of education within the issue, (3) factors affecting net interest costs of bond issues, (4) analysis of present status of school bonding.

The historical background is limited to (1) a brief delineation of legal status of Michigan school bonding, (2) the history of Michigan school bond debt, (3) the average municipal bond yields since 1915.

Latitude provided for boards of education involve only those areas of (1) what the money provided in the issue can be used for

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according to the terms of the issue, (2) the leeway that is within the jurisdiction of the local school board in the retirement of the issues, (3) the probable effect of these latitudes upon obtaining public approval for the issue.

The factors that affect the net interest cost were limited to those that appear either in the bond issue itself or in the notice of sale of said issue.

The study is limited to two hundred bond issues in excess of twenty thousand dollars, sold consecutively after July 1, 1954. It was determined that bond issues of twenty thousand dollars or less be deleted from the study because they can be sold through local advertising, and thereby fall into a different category than bonds in excess of twenty thousand dollars.

The Michigan Advisory Council publishes a notice of sale for each school bond issue prior to the date of sale of the issue. The notice contains most of the information pertinent to the bond issue.

II. DEFINITIONS OF TERMS USED

Although direct communication with each school district might have been pleasant, it was predicted that little if any benefit could be derived from such a procedure, as the information obtained from such an expensive and time-consuming procedure would be little if any different than the information published in the notice of sale.

Factors such as debt to valuation ratios, debt history, and

percentage of callable bonds could not be isolated entirely one from the other in relation to the net interest cost obtained for a bond issue. Because of the probable overlap, the degree of effect of each of the factors could not be measured except in general terms.

The analysis of the present school bonding status is limited, because of the short duration of time during which the present constitutional amendment has been in effect. However, it is believed that sufficient evidence is reported to reveal a trend, and to warrant suggestions for improvement.

The total study is limited to the existing legal framework. The writer is not qualified to question bond issues in relation to the legality of the issue, or to make suggested changes within the legal framework. Rather, it was confined solely to that area in which the decision making is at least in part within the jurisdiction of the board of education.

II. DEFINITIONS OF TERMS USED

12 John G. Fowlkes, School Bonds (Milwaukee, Wisconsin: Bruce Publishing Company, 1924), p. 24.

Certain terms are used in the pages that follow, and the ways in which they are to be interpreted in the study should be understood at the outset.

13 Lawrence Chamberlain, The Principles of Bond Investment, (Milwaukee, Wisconsin: Bruce Publishing Company, 1924).

Bonds. Fowlkes defines a bond as "an instrument issued by a corporate body in order to borrow money under expressed conditions

of interest and principal payment."¹²

Chamberlain describes school bonds as "simple" (or unsecured) quasi-municipal corporation issues for the purpose of purchasing, constructing, and equipping school property."¹³

The school bond, according to Rainey, is not a mortgage against the personal and real property of the individuals of a district, but merely a lien (or evidence of legal debt); thus the purchaser has no recourse at law against individuals in case of default or repudiation.¹⁴

Bonds are issued for long or short terms. Buehler defines a long-term issue as one of five years or longer.¹⁵

Capital Outlay. Capital outlay costs include payments for all labor, materials, supplies, and incidentals used in construction, or the total costs of finished items purchased.

School Elector. A citizen of the United States, twenty-one years of age, who is a resident of the municipality, and who on their face pledge the full faith and credit of the municipality

and/or 12 John G. Fowlkes, School Bonds (Milwaukee, Wisconsin: Bruce Publishing Company, 1924), p. 24.

Pay-As-You-Go. This plan requires that a school district 13 Lawrence Chamberlain, The Principles of Bond Investment, (Seventh Edition, New York: Henry Holt and Company, 1917), p. 103.

14 Homer P. Rainey, School Bonds, (Milwaukee, Wisconsin: Bruce Publishing Company, 1924).

15 A. G. Buehler, Public Finance, (Third Edition, New York: McGraw-Hill Book Company, 1948).

years of age, a resident of the state for at least six months, and a resident of the school district for thirty days or more is a qualified school elector.

III. ORGANIZATION OF FOLLOWING CHAPTERS

If the proposition to be voted upon is one involving the establishment of a lien against the personal and real property of the district, the elector must also be an owner of property assessed for tax purposes.

Funded Indebtedness. All indebtedness, including both principal and interest, evidenced by bonds, refunding bonds, notes or certificates of indebtedness lawfully issued or assumed, in whole or in part, by any municipality as a general obligation upon the municipality is considered funded indebtedness.

Obligations. This is a general term for evidences of indebtedness such as bonds, refunding bonds, notes, certificates of indebtedness and other like instruments issued by a municipality which on their face pledge the full faith and credit of the municipality and/or are payable primarily from taxes and/or special assessments.

Pay-As-You-Go. This plan requires that a school district levy an additional tax over a period of years to be put aside in a building and site fund. This money is used only when enough has accumulated to meet the cost of the project.

Tax Anticipation Notes. Tax anticipation notes are notes that

are issued by a simple resolution of the school board against the next current tax collection.¹⁶

III. ORGANIZATION OF FOLLOWING CHAPTERS

Chapter Two pertains to the review of correlated material already published. The material covered includes the requirements for a sound bonding program, and the effect of economic cycles on school bonding as well as the state's responsibility in the over-all debt program.

Chapter Three is devoted to a description of the methods and procedures used in developing this study.

The history of Michigan bonding, including the legal statutes from 1835 to the present, the bonded indebtedness since 1863, and the average bond yields since 1915 are discussed in Chapter Four.

Chapter Five is devoted to the areas that provide for latitude in school board decision making that is included within the bond issue, and the subsequent effect of such provisions upon securing popular vote approval.

Chapter Six includes those facets that were studied and

¹⁶ Betty Tableman, Paying for the Public Schools in Michigan, (Bureau of Government, Institute of Public Education, University of Michigan Press, 1951), p. 62.

analyzed in terms of whether or not they had any noticeable effect

CHAPTER II

upon the net interest rates received for the bond issues. The chapter was not limited to those factors such as percentage of callable bonds,

debt ratios, et cetera, but also included periods of marketing, legal

I. LITERATURE RELATING TO THE PROBLEM

counsel, acceptance of bid, and other factors pertinent to the interest costs. Some justifications for bonding. It is rather easy to sub-

stantiate Chapter Seven relates to the present bonding status. An attempt is made at this point to establish the present position of schools in relation to the ability to bond as well as to retire the bonds under current legislation. Certain recommendations are made that are believed necessary if districts are to continue to erect facilities to meet the growing needs.

Chapter Eight contains the summaries of the study, conclusions, and recommendations.

many established districts of long standing could have avoided the current need for bonding, had they had the foresight to provide future building funds during those years that additional school facilities were not in demand. However, whether they could or could not avoid the need for borrowing is of little consequence at present. The fact remains that if they need to erect school facilities and the building funds are not on hand, borrowing of such monies appears to be the only solution.

The greatest need for borrowing is probably in the newly

organized local school units and in the rapidly growing districts.

CHAPTER II

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I. LITERATURE RELATING TO THE PROBLEM

tion to the residential tax base. This position, as described by

George Some justifications for bonding. It is rather easy to sub-
stantiate that no municipality should place itself in debt if such a
position can be avoided without the serious impairment of a recog-
nized need. This generality is as true for school systems as it is
for any other municipality, and perhaps even more so. Unfortunately,
the majority of school districts are in such a position that it is nec-
essary to enter into some type of loan agreement in order to provide
necessary school facilities. the justification of long term borrowing

It is true that many established districts of long standing
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by Detroit Edison Co.).

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2 Leroy A. Shattuck, Jr., "A Study of the Debt & Prosperity
of such monies appears to be the only solution. No. 1, Dartmouth
College, Baltimore: The Johns Hopkins Press, 1941, p. 113.

The greatest need for borrowing is probably in the newly

organized local school units and in the rapidly growing districts. Many such areas have to provide a large scale building program within a relatively short time. Such districts are usually of suburban nature where the industrial tax base is generally rather low in relation to the residential tax base. This position, as described by George Lloyd, is financially detrimental to any municipality, and particularly to school districts.¹ As the area tends to stabilize, the need for additional facilities declines, and the industrial tax base tends to increase proportionately. So again, regardless of the relative merits of borrowing or not borrowing, the fact remains that present capital outlays on any large scale can not be accomplished except through some type of loan. 1870's, especially after the depression of Shattuck states that the justification of long term borrowing lies in the fact that the need for capital improvement arises at irregular and unpredictable intervals.² This condition is not as apt to develop in the established large communities, as city growth tends in terms of percentile increase to be less spontaneous. The large

1 George W. Lloyd, Tale Of Too Many Cities, (Published by Detroit Edison Co.).

2 Leroy A. Shattuck, Jr., "A Study of the Debt to Prosperity Ratio," Municipal Indebtedness, Series LVIII, No. 2, (Dartmouth College, Baltimore: The Johns Hopkins Press, 1940), p. 113.

4 Shattuck, op. cit., p. 9.

city is benefited further in that it has a more favorable opportunity to regularize capital outlays, which greatly reduces the need for long term borrowing. In fact, any locality which is large enough to maintain a continuous building program with fairly equal annual volume, can and should avoid any long term borrowing for school erection purposes.³ Borrowing has been, and probably will be, one of the necessary evils in most Michigan municipalities for some time to come.

Between 1830 and 1870, legislatures were easily induced to approve new municipal indebtedness, and the courts of the state were utilized as a restraining agency.⁴ Most states adopted constitutional restriction during the 1870's, especially after the depression of 1873, as an aftermath of the large number of defaults subsequent to the Civil War.

The problem then of protection of the community from administrative extravagance and increased public debts is not recent, but one of long standing.

Most of the early outstanding debt was for municipalities in the Administration of Public Schools in Florida. Other than school districts, because, as Halsey relates, the borrowing (N. Y., 1929), p. 68.

³ Donald Essex, "Bonding Versus Pay-As-You-Go," *The Finance* 3 Arvid J. Burke, Financing Public Schools in U.S., No. 496, (New York: Harper & Brothers, 1957), p. 198. (Columbia University, 1931), p. 101.

⁴ Shattuck, op. cit., p. 9.

for educational purposes was not a serious problem until the present century.⁵ Educational expenditures were relatively small and usually paid out of current taxes. However, increased enrollments and improved facilities have caused borrowing inevitably to become a part of the modern school as surely as it has found its way into industry.

The question then becomes not so much whether or not to borrow, but rather what is involved in the process of borrowing.

Bonding versus pay-as-you-go. There are two basic methods of securing relatively large sums of money to finance capital outlay programs: (1) bonding, and (2) pay-as-you-go, including reserve accumulations and current levies. The relative merits of each method of financing have been described in detail by Essex.⁶ His findings suggest that neither plan is satisfactory under all circumstances. Pay-as-you-go tends to avoid interest costs. Bonding spreads the burden over a period of years, and is feasible under more circumstances than other plans. Paying for each program before the

A second observation that could cause pay-as-you-go to cost

⁵ Henry Rowland Halsey, "A Study of Borrowing Practices in the Administration of Public Schools in Florida," Contributions to Education, No. 368, (Teachers' College, Columbia University, N.Y., 1929), p. 68.

⁶ Warren T. White, et al., "American School Buildings," Twenty ²⁹² Donald Essex, "Bonding Versus Pay-As-You-Go In The Financing Of School Buildings," Contributions To Education, No. 496, (New York: Bureau of Publications, Teachers' College, Columbia University, 1931), p. 101.

next one is undertaken restricts the pay-as-you-go plan to communities that enjoy a large tax base.

Only the larger and wealthier school districts have sufficient taxable wealth to provide adequate funds for plant construction on an annual pay-as-you-go basis. The practice is sound if current tax-paying capacity is sufficient, but most school units, of necessity, resort to long-term borrowing in order to finance their plant program.⁷

One observation is that bonding may be cheaper than pay-as-you-go when cash loaned to the district is invested at higher rates of interest than that which has to be paid on the bonds. The fallacy in this thinking is that there is always the danger of losing a part of the principal when high interest yields are given paramount consideration in selecting securities for investment purposes, even though the state statutes place limitations on the type of securities in which schools can invest said funds.⁸

A second observation that could cause pay-as-you-go to cost more than bonding, or at least to greatly reduce the financial

Neither program has all of the advantages of the other

⁷ Warren T. White, et al., "American School Buildings," Twenty-seventh Yearbook, AASA, (Washington, D.C., 1949), p. 292.

⁸ Henry H. Linn, "Safeguarding School Funds," Public Acts of Michigan, 1951, Act No. 195, p. 248. (Columbia University, 1930).

advantage of pay-as-you-go, is the increasing cost of construction. That is, if school construction is needed during periods of economic prosperity, the building cost index may rise so rapidly that increased erection cost as a result of delayed construction can conceivably absorb an amount equal to or greater than the cost of bond interest.

A third observation is that most school systems, attempting the defensible practice of paying cash for school plant construction, find it necessary to accumulate reserves for varying periods of time. It is extremely important that these funds are carefully administered, and that money is available for intended purposes at the specified time. Large reserve funds provide temptation for an administration to withdraw funds from the reserve for purposes other than originally specified. The possibility of such misappropriation of funds, as well as the possible legal loss of funds, has caused Linn to suggest that even short time accumulations are not generally advisable.⁹ Indeed, both the bonding and the pay-as-you-go methods of financing capital outlay require competent administration. Neither program has all of the advantages, nor does either

⁹ Henry H. Linn, "Safeguarding School Funds," Contributions To Education, No. 387, (New York: Bureau of Publications, Teachers' College, Columbia University, 1930).

have all of the disadvantages. Writers in general have stressed the desirability of borrowing and building in times of deflation, and the curtailment of capital outlay in inflationary periods. The theory is undoubtedly sound, but it is also generally impractical.¹⁰ The present day backlog of war deferred school construction and the increasing enrollment make expansion of school facilities necessary regardless of economic conditions. Neither children nor parents can afford the educational lag that would result in most school districts from a policy of providing construction solely on a pay-as-you-go program. Small indeed is the number of school districts that could provide even the minimum requirements in school housing on such a program, even if the district employed the use of tax anticipation notes. The question in the vast majority of school districts is not whether they should or should not issue bonds for the purpose of capital outlay, but what type of bonding program best meets their needs.

Types of Bonds. In the past, school bonds have been issued in two common types, and in a third type less commonly used. Of

¹⁰ William Arnold, et al., Problems and Issues in Public School Finance, N.C.P.E.A., (New York: Columbia University, 1952), p. 416.

these three types of bonds previously used in Michigan, only the serial type bond has survived the ravages of time. It is expedient to relate briefly here the characteristics of the term or sinking-fund bond and the serial-redemption sinking-fund bond in order to better understand the serial bond.

Term bonds were scheduled to mature at a single date, usually twenty years after date of issuance. This type of bond required careful management to insure that payments sufficient to enable the district to retire its debt when due, were placed in the sinking fund. The term bonding program provided two serious pitfalls that contributed toward the outlawing of its use in the bonding of Michigan school districts. First, the bond program required very careful administration of the debt by the board of education and the superintendent of schools. The possibility of change of personnel in these areas during the life of the issue constituted a very serious problem as to the efficient handling of the debt. Secondly, it was necessary to provide some means of safe investment for the large sinking-fund accumulation. Such an investment not only had to be safe, but also had to be of a nature that its funds could not be used for purposes other than that for which the fund was originally intended.

11 "American School Buildings," Twenty-second Yearbook of American School Buildings (Washington, D. C.: 1949), p. 298.

combination type bond that was occasionally marketed during the depression years, usually as a refunding program. Although this type of bond is not legal in the State of Michigan, it is recommended by the American School Administrators' Association.¹¹

This type of bond probably should be more widely utilized in new school-bond issues because it has the advantage of both serial and sinking-fund types, and the disadvantage of neither. It is a term bond in that all the issue is scheduled to mature on the same future date, and is callable. However, the bonds are numbered serially. A provision in the deed of trust requires the school district to vote a continuing tax for the life of the issue. Annual collections from this levy are pledged to the sinking-fund, with the requirement that the sinking-fund be exhausted annually by the call and redemption of bonds in serial order. It is possible for the purchasers of such bonds to plan their investment portfolios with reasonable accuracy. For the school district that votes a tax rate instead of a definite sum, this type of bond protects the schools against unfavorable fluctuations in depression times and accelerates the retirement of the debt in good times.

The serial-redemption sinking-fund bond is a callable bond in which the debt is paid off in serial order as rapidly as accumulations from a continuing levy permit. This is a somewhat flexible instrument, permitting the acceleration of redemption in good times, and deceleration when revenues decline. The advantages of this

kind of bond would seem to more than offset the somewhat higher

¹² Arnold, *op. cit.*, p. 407.

¹³ Public Acts of Michigan, 1937, Act No. 28.

¹⁴ Public Acts of Michigan, 1949, Act No. 28.

¹¹ "American School Buildings," Twenty-seventh Yearbook of American Association of School Administrators, (Washington, D.C.: 1949), p. 298.

interest rate that it demands. It is recommended as possessing the advantages of both serial and sinking-fund types and the disadvantages of neither.¹²

Regardless of the relative merits of the term bond and serial-redemption sinking-fund bond, the only type of bond available for Michigan school bonding, under present statutes, is the serial fund bond.¹³ Serial bonds may be issued for a period up to thirty years.¹⁴ The principle characteristic of the serial type is that it provides a definite maturities schedule for each year until the debt is retired. It is the general practice to amortize these maturities so that the sum total of principal and interest payments remains somewhat constant during the life of the debt.¹⁵

Even though serial bonds may be issued for a period of thirty years, serious consideration should be given to the use of five or ten year terms whenever possible. All other things being equal, the school debt should be retired as soon as possible. Not only should inflated building costs be paid with inflated dollars, but the annual

¹² Arnold, op. cit., p. 407.

¹³ Public Acts of Michigan, 1937, Act No. 88, p. 120.

¹⁴ Public Acts of Michigan, 1949, Act No. 263, p. 356.

¹⁵ "American School Buildings," op. cit., p. 294.

principal payments immediately increase the borrowing capacity of the district under a debt limitation.¹⁶

When serial bonds are issued for periods of at least five years or more, they should contain a callable feature. That is, the district should provide a certain number of bonds that are payable on call by the district. Thus, when interest rates decline significantly, the schools may effect a savings by refunding the debt at a lower rate. Or, if a surplus is accumulated in the debt retirement fund, the district may pay off the callable bonds before maturity date and save interest costs. The call feature may carry a slightly higher rate of interest, but nevertheless is considered good financing.¹⁷

Michigan has the advantage of having both the unlimited and limited type serial bond. Since each of these bonds has definite characteristics, and since a school district must make a choice, it is important that the board be cognizant of those characteristics.

Limited tax bonds may be issued for a period not to exceed twenty years. The electors must approve the issuance of the bonds at a regular or special election. The electors must also approve an increase in the tax limitation sufficient in amount to provide funds

¹⁶ Ibid., pp. 294-98.

¹⁷ Arnold, et al., op. cit., p. 407.

to pay the principal and interest obligations of said bonds as they come due. The basic security back of limited school bonds is the voted tax millage on an equalized property tax base.¹⁸

The legal machinery is thereby established that theoretically allows the collection of taxes and the issuance of bonds for a twenty year period. In practice, however, such is not the case. The marketability of the bond demands a certain degree of security, so it is generally necessary to vote the millage increase for a period of from two to five years beyond the life of the bond issue. Thus, when the tax millage increase can be legally extended for a period of not more than twenty years, the life of a good marketable bond issue is immediately limited from fifteen to eighteen years.

Because the tax rate is limited in a limited tax bond, it is feasible that a reserve fund be established in order to protect the bond holder and the district against the day that tax levies are not collected as anticipated. Further, it is necessary to allow for delinquency in tax collections, even in normal times, of from 20 per cent to 45 per cent. Both of these factors again contribute to the shortening of the time for which the tax limited serial bond can be in case of an expansion program resulting from

¹⁸ Kenower, MacArthur and Co., Financing the Public School System in the State of Michigan, (Detroit, Michigan, 1953), p. 7. ¹⁹ Public Acts of Michigan, 1949, Act No. 281, p. 356.

issued. *on increase or for any other voter approved capital outlay*

program In terms of ratio of debt to valuation, the Municipal Finance Commission will not approve limited tax bond issues that result in a bonded indebtedness of greater than 15 per cent of the total assessed valuation.¹⁹ Bond purchasers sometimes refuse to submit bids for bonds when the debt ratio is in excess of 10 per cent, even though the Municipal Finance Commission has granted permission to sell the bonds. If the bond purchaser does submit a bid, it is not as favorable as it would be if the bonded indebtedness were less than 10 per cent of the total assessable wealth as equalized.

and (3) Since limited tax bonds are then relatively short term bonds, they become a rather desirable bond for a school district that has a low debt to valuation ratio because: (1) the interest rate is usually less than the interest rate for long term bonds, (2) bonds may be made callable at a rather early date without seriously handicapping the marketability of the bond, (3) such early call dates permit the refinancing of the callable portion of the issue should economic conditions favor a considerably lower potential interest rate, (4) the ability to refinance the callable portion also allows for new financing in case of an expansion program resulting from unanticipated school

20 April, 1955.

¹⁹ Public Acts of Michigan, 1949, Act No. 263, p. 356.

population increase or for any other voter approved capital outlay program.

The unlimited-tax bond, a serial bond, was made available to school districts through the adoption of Section 27, Article X, of the Michigan Constitution.²⁰ This amendment was developed because: (1) school districts in general were bonded to a point where it was no longer possible to bond under the 15 per cent debt to valuation ratio, (2) in many situations it was not possible under existing statutes and economic conditions to retire the tax limitation bonds within the period of time for which they could be issued, and (3) even when it was possible to retire tax limitation bonds, the tax levy was so prohibitive that the public was beginning to rebel against the passage of such issues.

The unlimited-tax bond differs from the limited-tax bond in that the unlimited-tax issue is not subject to the fifteen mill tax limitation, provided the last maturity date does not fall due in less than twenty-five years from the date of issue.²¹ Thus, no millage increase has to be voted by electors of the district for this type bond. Each year an amount necessary to pay the principal and interest

²⁰ April, 1955.

²¹ Public Acts of Michigan, 1955, Chapter 12, Section 681, Act 269.

obligation is levied as a tax within the district. Thus, if a district should for any reason have a rapid decline in valuation, and at the same time have a large outstanding debt, it is conceivable that an extremely high tax rate could be levied against the district. It is this fact that the bond issue is exempt from the fifteen mill limitation, that the name unlimited-tax bond is derived, rather than the length of time for which it is issued.

The advantages of the unlimited-tax bond issues are:

(1) the length of time allowable for retirement of obligation results in a more even spread of taxation among present and future property owners, (2) even though the tax rate is usually higher for long term bonds, the principal and interest payments can be kept to a minimum by spreading the payments over a greater number of years, (3) the bonds are payable from unlimited taxes. Thus the necessity for establishing a reserve fund is eliminated, and (4) the 15 per cent debt to valuation limitation is lifted for unlimited bond issues which enables a school district to bond itself up to any amount, provided a purchaser for the bonds can be obtained.

The inherent weakness of the unlimited-tax bond is that the tax levy under certain circumstances could be exorbitant. This possibility was foreseen and provisions were made for the

"qualification" of bonds.²² All outstanding school bonds issued prior to May 4, 1955, were automatically qualified for state loan purposes, and all unlimited-tax bonds issued subsequent to May 4, 1955, were eligible for qualification.

A bond is qualified by the simple process of receiving affirmation from the Superintendent of Public Instruction that the bond is eligible for a loan in the event that a thirteen mill debt tax levy is not sufficient to meet the principal and interest obligations in any one year. This provision does protect the taxpayer from an excessive high levy in any year. Some schools have failed to qualify their unlimited bond issues either because they believed that it was not expedient, or because they did not choose to make the necessary effort. It would appear to be desirable for every school district to qualify their bonds even though the necessity for any future borrowing appears to be remote.

Requirements for sound bonding. Several items are taken into consideration when bond dealers are considering the purchase of a new bond issue. The dealer analyzes the issue from a quality standpoint, and determines (1) whether the school board has a good attitude toward its creditors, (2) whether it has had a past history of

²² State Constitution of Michigan, Article X, Section 27.

default and, if so, for what reason, (3) whether tax collections are average or better than average, (4) whether the district is residential, industrial, agricultural, resort, or combinations of the foregoing, and whether the district has had major problems along this line that affect the valuation of the district, and (5) whether the new issue is properly set up so as to protect both the purchaser and the issuing municipality. Points to consider when issuing new bonds are covered more fully elsewhere in this study. Let us consider separately each of the foregoing items.

First, the attitude of school board members toward creditors is carefully considered by bond purchasers. Fortunately, most school officials recognize that they have a big responsibility in handling the financial affairs of their respective districts, and cooperate to the utmost to "sell" the district to bond buyers. They realize that their performance and willingness to cooperate are important factors. The election of new school board members who have not had an opportunity to acquaint themselves with major problems that may be pending at the time of their election, or who have set ideas of their own about school problems, can upset the best laid plans, and even damage a sound financial position.

Secondly, many districts were forced to default principal and interest payments back in the early 1930's, during the commonly

called "depression period". Some defaults resulted from the impounding of funds in closed banks, and many school districts with adequate funds on deposit to meet principal and interest payments were unable to make these payments. Other districts suffered from insufficient tax collections which did not allow for payment of principal and interest in full. Partial payments or no payments at all were the order of the day. Other districts used the bulk of their tax collections, including operating and debt service tax collections, to cover payrolls and operating costs. This depleted funds that would have been used to meet debt obligations. The attitude of school officials in working out this problem, either by late payment or by refunding, is a matter of record that is considered by all bond dealers when bidding on bonds.

Thirdly, the percentage of current tax collections is of major importance to bond purchasers. The Municipal Finance Commission of the State of Michigan, which must approve the sale of all municipal bond issues in the state, will not approve an issue if current tax collections of the municipality are less than 75 per cent of the tax levy. If tax collections are low, (less than 90 per cent currently) then bond dealers want to know the reasons for slow collections. Among the reasons may be a lack of community interest or pride, a one-industry community where the industry is forced to curtail

business for one reason or another, an agricultural area where crops are affected, a resort area where taxpayers pay taxes in the summertime rather than when due, etc. Each issuing municipality, if tax collections are less than 90 per cent currently collected, must account for the reason or reasons.

Fourth, the great building boom of the current period has brought many problems to school districts. There are more suburban residential districts suffering from growing pains than ever before. More homes mean more children and more needed school facilities. Other districts are benefiting from industrial growth that absorbs a large percentage of the tax burden of the district. Residential and industrial areas are having more problems than the agricultural areas, even though the agricultural areas in many instances are reverting to residential areas. Agricultural areas on the whole are more stable, and tax collection records of such districts are good. Many former resort areas have been changing over to permanent residences, and as such have become more stable.

Fifth, bond dealers are as desirous as are school officials to have a marketable security that is properly set up to protect both the purchaser and the school district. Bondholders like to feel that a district can and will pay principal and interest in accordance with a schedule that will not be a hardship on the taxpayers. Likewise,

they feel that school districts when entering into a contract should live up to the terms as provided in that contract. Bids are submitted to school districts in accordance with these terms, and dealers are able to forecast the life of the issue based upon probable performance.

Every bond dealer has access to the records indicating the level of the market. The appetite of the buyers is determined by the quantity of bonds being currently offered for sale. If bond issues are plentiful, the buyer will be more careful in screening and considering quality of the issue, which makes it a good profit maker from the standpoint of quick resale. If bonds are not so plentiful, bond dealers are apt to bid for issues that they would not consider if they had a choice. Dealers, to stay in business, must have merchandise to sell. These issues, however, are scrutinized very carefully, and net interest costs to the issuing municipality may be high.

In determining the net interest costs, the buyer first determines what the bond should yield. The dealer then determines what coupon rate or rates plus a premium (or less a discount) will produce such a yield. Thus the interest rates which the bonds will bear are established. If the issuing municipality has offered bonds previously, then a pattern has already been established, and this is used in establishing new bids. This, in part, accounts for close bidding by

I have been thinking of you very much lately, and wondering how you are getting on. I hope you are well and happy. I have been very busy lately, but I have managed to find some time to write to you. I have been thinking of you very much lately, and wondering how you are getting on. I hope you are well and happy. I have been very busy lately, but I have managed to find some time to write to you.

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bond purchasers or dealers. Where a municipality has offered bonds on a fairly regular schedule, the differences in rates merely reflect the market trends.

The procedure to follow in setting up a bond issue to the best interest of both buyer and seller should involve the following steps in chronological order:

1. Advice from state officials
2. Choice of a reputable bond attorney
3. Legal school board adoption of bond resolution
4. Authorization of bond issue
5. Planning of debt instrument -- type, call provisions, paying dates, agent and place, denomination, maturity schedule
6. Approval of Municipal Finance Commission to sell bonds
7. Marketing the bonds -- prospectus, credit rating, basis for bidding, advertising for bids, acceptance of sealed bids
8. Acceptance of low bid or rejection of all bids
9. Printing, signing, and delivering bonds to purchaser
10. Obtaining final legal approval
11. Obtaining money from sale of bonds
12. Safeguarding of funds through the establishment of a construction or building and site fund

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13. **Establishment of debt retirement fund, schedule for payment of principal and interest, cancellation of redeemed bonds.**

It is important in the setting up of the long term debt instrument that the following criteria is generally followed:

1. **Bond program should fit into existing debt maturity schedules**
2. **Payments should fall due at time of maximum tax collections**
3. **Bonds be dates near date of sale**
4. **Bonds be in denominations of one thousand dollars**
5. **Annual requirements of principal be in blocks of five thousand dollars**
6. **Interest be payable semi-annually**
7. **Principal registration be optional to buyer**
8. **Debt retirement begin within two years of issuance**
9. **Proceeds not be used for purchase of moveable equipment with life expectancy of less than five years**
10. **Early redemption schedule be consistent with ability to pay**
11. **Provide progressive release of borrowing capacity**
12. **Be balanced with respect to bond and taxing power, income, and debt**
13. **Be specified in the ballot the purpose for which voted increase is to be used.**

If the obligation is to be a tax-limited issue, include the

1. The first part of the paper is devoted to the study of the properties of the function $f(x)$ defined by the equation

$$f(x) = \int_0^x \frac{1}{1+t^2} dt.$$

It is shown that the function $f(x)$ is continuous and differentiable on the interval $(-\infty, \infty)$.

2. In the second part of the paper, we consider the function $F(x)$ defined by the equation

$$F(x) = \int_0^x \frac{1}{1+t^2} dt + \int_0^x \frac{1}{1+t^4} dt.$$

It is shown that the function $F(x)$ is continuous and differentiable on the interval $(-\infty, \infty)$.

3. In the third part of the paper, we consider the function $G(x)$ defined by the equation

$$G(x) = \int_0^x \frac{1}{1+t^2} dt + \int_0^x \frac{1}{1+t^4} dt + \int_0^x \frac{1}{1+t^6} dt.$$

It is shown that the function $G(x)$ is continuous and differentiable on the interval $(-\infty, \infty)$.

4. In the fourth part of the paper, we consider the function $H(x)$ defined by the equation

$$H(x) = \int_0^x \frac{1}{1+t^2} dt + \int_0^x \frac{1}{1+t^4} dt + \int_0^x \frac{1}{1+t^6} dt + \int_0^x \frac{1}{1+t^8} dt.$$

It is shown that the function $H(x)$ is continuous and differentiable on the interval $(-\infty, \infty)$.

5. In the fifth part of the paper, we consider the function $I(x)$ defined by the equation

$$I(x) = \int_0^x \frac{1}{1+t^2} dt + \int_0^x \frac{1}{1+t^4} dt + \int_0^x \frac{1}{1+t^6} dt + \int_0^x \frac{1}{1+t^8} dt + \int_0^x \frac{1}{1+t^{10}} dt.$$

It is shown that the function $I(x)$ is continuous and differentiable on the interval $(-\infty, \infty)$.

6. In the sixth part of the paper, we consider the function $J(x)$ defined by the equation

$$J(x) = \int_0^x \frac{1}{1+t^2} dt + \int_0^x \frac{1}{1+t^4} dt + \int_0^x \frac{1}{1+t^6} dt + \int_0^x \frac{1}{1+t^8} dt + \int_0^x \frac{1}{1+t^{10}} dt + \int_0^x \frac{1}{1+t^{12}} dt.$$

It is shown that the function $J(x)$ is continuous and differentiable on the interval $(-\infty, \infty)$.

7. In the seventh part of the paper, we consider the function $K(x)$ defined by the equation

$$K(x) = \int_0^x \frac{1}{1+t^2} dt + \int_0^x \frac{1}{1+t^4} dt + \int_0^x \frac{1}{1+t^6} dt + \int_0^x \frac{1}{1+t^8} dt + \int_0^x \frac{1}{1+t^{10}} dt + \int_0^x \frac{1}{1+t^{12}} dt + \int_0^x \frac{1}{1+t^{14}} dt.$$

It is shown that the function $K(x)$ is continuous and differentiable on the interval $(-\infty, \infty)$.

following criteria:

14. No maturities of greater term than twenty years
15. Ten per cent margin of obligation reserved for emergency
16. Debt service not greater than 25 per cent of total annual budget
17. Twenty-five per cent of principal to be paid within five year period
18. Tax increase provided for liberal allowance of tax delinquency
19. Tax increase provided for several years beyond maturity of issue.

Effect of economic cycles upon bonding. Economic cycles can affect public school bonding in at least three areas. First, the cost of construction and the resulting amount of the bonded debt is directly related to the economic conditions prevailing or anticipated at the time of construction contract letting. Clark states:

The decline in actual cost of school building has not been very large, but existence of a decline itself, however, is of very great importance. The very fact that costs have gone down even by an extremely small amount has led to bids closer to actual cost than in the past. If prices had continued to go up as they have rather steadily for fifteen years, the normal tendency would have been for a contractor to add a very substantial amount to his bid for that expected rise. If, on the other hand, prices have stabilized, or are declining slightly, the contractor is much more likely to present what he thinks is a fair bid for the actual cost of the building.²³

²³ H. C. Clark, "School Building Cost and Bond Prices," School Executive, 72:22, July, 1953.

It may be assumed then that the economic cycle affects not only the true building cost index, but also the estimated margin of profit expected by the contractor, both of which determines in a degree the amount of the bond issue.

The second area is the effect of the economic cycles upon the net interest cost of the bond issue. According to Clark, a slight easing of the boom (1953) should have resulted in a downward trend of interest rates.²⁴ The average municipal bond rate reveals that the net interest costs did drop slightly during the year of 1954, and again began to rise with the inflationary spiral that followed the 1953 period.²⁵

The fact is generally accepted that a bountiful supply of free money results in lower prevailing bond interest rates, provided the buyers of bonds are not faced with the anticipated danger of an inflationary spiral. If such a spiral is in the offing, the converse is true. A bond provides no means of appreciating in value, consequently a bond buyer demands a higher rate of interest to offset the loss of possible appreciation of monies available in other types of investment.

24 Clark, loc. cit.

25 Table IV, Appendix.

• **Prevalence** = the proportion of a population that has a disease at a particular point in time

The effect of the supply of money available for the purchase of bonds is very evident in the interest rates obtained for bond issues in the years 1956 and 1957. The Federal Reserve Bank, in an attempt to control the inflationary spiral, tightened the credit restrictions that resulted in less money being available for investment purposes. The direct result was an increase in the net interest rates obtained for school bonds, and also in the national municipal average bond interest rate.

The third area is that of the ability of the district to retire its incurred bond obligation, which is directly related to the economic cycles. Moehlman states:

Regardless of how well-balanced the tax revenue program is, or how carefully it is spread among state, local, and federal governments, it is necessary to recognize the effects of the economic cycle upon revenue. All tax revenue will diminish sharply during depression periods because of the decline in national income Piling up long-term indebtedness for capital improvement provides a heavy handicap during periods of depression which is neither economical nor efficient.²⁶

The ability to retire a school bond debt is directly related to the school district's ability to collect taxes, and the ability of the school to collect taxes is specifically effected by the economic cycles.

²⁶ Arthur B. Moehlman, School Administration (New York: Houghton Mifflin Co., 1951), p. 413.

1. The first part of the report is a general introduction to the subject of the study. It discusses the importance of the study and the objectives of the research. It also provides a brief overview of the methodology used in the study.

2. The second part of the report is a detailed description of the study area. It includes information about the location of the study area, the population of the study area, and the characteristics of the study area.

3. The third part of the report is a description of the data collection process. It includes information about the sources of data, the methods used to collect data, and the time period over which data was collected.

4. The fourth part of the report is a description of the data analysis process. It includes information about the statistical methods used to analyze the data and the results of the analysis.

5. The fifth part of the report is a conclusion and recommendations. It summarizes the findings of the study and provides recommendations for future research.

6. The sixth part of the report is a list of references. It includes a list of all the sources of information used in the study.

7. The seventh part of the report is an appendix. It includes any additional information that is relevant to the study but is not included in the main body of the report.

8. The eighth part of the report is a glossary. It includes definitions of all the terms used in the report.

9. The ninth part of the report is a list of figures and tables. It includes a list of all the figures and tables included in the report.

10. The tenth part of the report is a list of abbreviations. It includes a list of all the abbreviations used in the report.

11. The eleventh part of the report is a list of acknowledgments. It includes a list of all the people and organizations that have helped in the study.

12. The twelfth part of the report is a list of appendices. It includes a list of all the appendices included in the report.

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21. The twenty-first part of the report is an appendix. It includes any additional information that is relevant to the study but is not included in the main body of the report.

22. The twenty-second part of the report is a glossary. It includes definitions of all the terms used in the report.

23. The twenty-third part of the report is a list of figures and tables. It includes a list of all the figures and tables included in the report.

24. The twenty-fourth part of the report is a list of abbreviations. It includes a list of all the abbreviations used in the report.

25. The twenty-fifth part of the report is a list of acknowledgments. It includes a list of all the people and organizations that have helped in the study.

26. The twenty-sixth part of the report is a list of appendices. It includes a list of all the appendices included in the report.

27. The twenty-seventh part of the report is a list of references. It includes a list of all the sources of information used in the study.

28. The twenty-eighth part of the report is an appendix. It includes any additional information that is relevant to the study but is not included in the main body of the report.

29. The twenty-ninth part of the report is a glossary. It includes definitions of all the terms used in the report.

30. The thirtieth part of the report is a list of figures and tables. It includes a list of all the figures and tables included in the report.

31. The thirty-first part of the report is a list of abbreviations. It includes a list of all the abbreviations used in the report.

The inability to collect taxes following the depression of 1929 resulted in minor defaults of payments to bond holders and the refinancing of bond debts to reduce the yearly payment of principal and interest through the extension of the payment of the debt over a greater length of time.

Bonds are prepared and sold with definite safeguards that are computed to be sufficient to offset considerable fluctuation in the economic cycle. However, when extreme or unusual circumstances present themselves, the safeguards may not be sufficient to completely offset the condition.

The resulting effect is greater than the mere inability to retire the bond obligation. The noticeable absence of new school construction for a period of years following the 1929 stock market crash and the restrictive legislation for school bonding enacted by constitutional amendment in 1932, are ample evidence of the attitude of the public toward incurring any new debt obligations subsequent to such an experience.

A second effect of such an extreme change in the economic conditions is that, when a school district defaults in its debt obligation or is unable to make the principal and interest payments on schedule due to the percentage drop in tax collections, the ensuing bond issue will demand a higher rate of interest in relation to the

prevailing average marketable rate than it would have, had the defaults not occurred.

Impact of bonded indebtedness upon the educational program.

Holy and Herrick reveal the impact that financing bonded indebtedness had upon teacher salaries and educational programs during the depression:

Thousands of teachers had their salaries reduced during the 1930's so that money could be transferred from the teachers' fund to pay maturing bonds and interest. Hundreds of school systems all over the country had their educational programs sharply curtailed during that period because of heavy debt requirements which had prior claim on school revenues. It was not uncommon to find systems in which one-third of the money available for school purposes was devoted to bond and interest payments. The resumption of school construction now getting underway sets the stage for the repetition of these circumstances and their regrettable impact on instruction.²⁷

What is the status of bonds if a national calamity should occur, and valuations and tax collections reach a point where the voted tax increase will not produce sufficient revenues to retire the bonds within the limit of years that the tax increase was voted?

John H. Nunnely answers the question as follows:

Such bonds are still by law full faith and credit obligations of the school district, and would have to be paid out of

²⁷ Thomas C. Holy and John H. Herrick, "School Plant," Encyclopedia of Educational Research, (New York: The MacMillan Company, 1950), p. 166.

current allocated tax revenues and state aid funds to the extent that state aid funds are not specifically allocated by law to other purposes.²⁸

If an obligation can provide the potential for a curtailed school program, then the future educational program is somewhat contingent upon the method used in financing present day construction.

This would be especially true in cases where funds for the retirement of debt obligations have first priority on tax money collected by the district, and if there came to pass a large amount of tax delinquency. Writers reveal that bond obligation laws effect the school program in that monies needed for general operation can be diverted to debt retirement funds by an inequitable tax levy. Further, that monies not earmarked for specific uses by statutes can be transferred from general operating to debt retirement by action of the board of education. Some indications are that monies were transferred by boards of education to debt retirement funds with disregard to the statutes earmarking such operating funds for other purposes. It is important to relate here that the converse on occasion has also taken place and is illegal. That converse is the practice followed by some boards of education in transferring of monies from the debt retirement fund to which it is specifically

²⁸ John H. Nunnely, "Michigan School Bonds," Bond Buyer, May 16, 1953.

allocated to other funds for other purposes.

Such an action by a board of education not only is illegal, but it could also seriously affect the ability of the board to market future bond issues at a favorable interest rate. So far, only the effect of a major calamity has been discussed in relation to the impact of bonding upon the educational program. There is, however, another aspect that is certainly worthy of consideration. In Michigan a large capital outlay for school building took place in the period from 1910 to 1930. The subsequent depression and inability to meet tax obligations resulted in an adverse attitude toward further capital expenditures prevalent to World War II.

In the post war period, school construction again skyrocketed, and many school districts were again indebted to a precarious percentage of the total taxable wealth within the district.

Mc Clurkin points out that two conditions jeopardize the school position even more than the debts of pre-depression periods. The federal government and the state government have now usurped a greater share of taxable resources, and local assessments have not kept pace with the enormous advances in income and real values.²⁹

The result is that in spite of local affirmation for the

29 Arnold, et al., op. cit., p. 398.

construction of new school building in recent years, the people are adverse to the mounting debt, and have a tongue-in-cheek attitude toward such expenditures. Though the public is paying for buildings, it resents high tax rates; and because the debt tax rate is high, the limitation of local tax for operation is fixed at a lower level than otherwise might be. This in turn is one of the factors contributing to a scarcity of teaching staff, and the current problem of a too low teacher wage scale.

One could even theorize that the current critical attitude toward schools stems in part from the tremendous tax burdens resulting from bonded indebtedness.

The state's responsibility to the debt program. Michigan has not faced realistically the need for a plan that will provide adequate school facilities for children throughout the state. Facts show that there are districts which do not have sufficient resources to provide adequate school housing for their children with the funds available from a reasonable local tax effort. Local tax sources are largely confined to real estate, and this wealth is so unevenly distributed among school districts that nothing could be more unrealistic or unfair than to demand each school district to carry its entire school construction debt.³⁰

³⁰ Finis E. Engleman, "School Financing," School Executive, 76:64, April, 1957.

Even though the number of school districts has been greatly reduced in the state, there are still in existence many small school districts. Some of these districts are islands of wealth, while others, often adjoining, are poverty ridden.

Many individuals have proclaimed that no school building problem would exist if the districts would but reorganize. No doubt such a solution would in many cases greatly facilitate the providing of adequate school housing. However, the basic assumption is still in error unless the districts could be divided and organized in such a way as to somewhat equalize the taxable wealth. Such a division of school areas is neither possible nor entirely feasible. Certainly one could not advocate the reorganization of school districts strictly on an economic basis with reckless abandonment of all other socio-economic factors.

Other individuals have with equal zeal condoned the fact that if assessments were equal, poor districts would cease to be poor. This assumption is also in error. A casual survey will reveal to any investigator that the ratio of assessment to true value is not always low in the poor district and high in the wealthy district. The fact remains that whether districts are reorganized or whether tax assessments are exactly equalized, some areas are just less wealthy than other areas. Further, that the amount of local wealth does not

regulate the degree of need for additional school facilities.

Education has long been recognized as a function of the state; yet tradition holds that the local school district be responsible for financing its school building. Such a view has constituted a serious obstacle in the development of a feasible program designed to meet the current school building needs. For some time many individuals have recognized that the property tax base is too narrow to satisfactorily or equitably finance the current school program. By 1951, approximately nineteen states were providing some assistance from state funds for financing capital outlay.³¹ Today, nearly one-half the states contribute in some way to the local school district's capital outlay program. Morphet describes in detail many of the kinds of state appropriations that have been or are being tried.³² Such programs vary in type from loans to outright grants, the most interesting one being the Building Authority Plan currently used in Pennsylvania. More about these programs will be related later. It suffices here to state that none of these programs are without their peculiar advantages and disadvantages.

Many problems develop in any type of program involving state

31 Edgar L. Morphet, "State Responsibility for New School Construction," School Board Journal, 134:31, May, 1957.

32 Loc. cit.

assistance. A sound, long range program, for example, must take into account (1) local effort, (2) ability, (3) need, (4) economy, and (5) control. Not only must these phases be recognized, but a method must be developed to measure them objectively in order to simulate equality between districts.

One type of program that has received little recognition to date, yet appears to have merit, is a revolving-fund method. Such a plan would eliminate, or at least greatly reduce, the objections that have plagued other methods. Under such a program, the State of Michigan would provide the means for loaning building funds to a district. The district in turn would reimburse the state according to a prearranged program based upon the ability of the school district to pay. The state would accept the interest charges, if any, upon the funds loaned, and the district would repay only the principal borrowed. Such a program would eliminate one of the hidden high costs of school financing. Often the interest paid by a school district on a loan exceeds the amount of the original debt.³³ Further, it would eliminate the existing inequality of the poorer district paying the higher net interest

33 Henry Rowland Halsey, "A Study of Borrowing Practices in the Administration of Schools in Florida, " Contributions to Education, No. 368 (Teachers' College, Columbia University, New York, 1929), p. 68.

cost because of high debt to valuation ratio and the necessary longer bonding period. The state, on the other hand, should accept the interest cost as it would be considerably less in amount than almost any other program that is currently in effect.

The revolving-fund program would leave the extent of capital outlay in the control of the district, thereby eliminating the necessity of over-all state control so evident in outright grant programs. Further, the approval by the local district of what is to be constructed, as well as the amount to be levied for repayment of the loan, would eliminate the danger of excessive squandering that often accompanies any form of outright grants.

Every school district would receive equitable treatment. The people could provide the facilities that they deemed necessary and for which they were willing to pay. No one would be getting something for nothing. No district would be getting preference over another district through subjective evaluations at the state level. The district that previously made effort to solve its problem would not be overlooked in favor of the district that showed a greater need but had exercised less effort, as is so evident in the current Federal Aid Program. The district with the very low tax would not be distressed by the enormous interest cost burden, and its rate of tax levy need not be exorbitant. No district so far studied is so poor that

it could not pay for its own facilities if the high interest cost were eliminated and the debt was extended for a longer period of time.

One of the major advantages of such a revolving fund is that a time would evolve in which the loans would not exceed the district payments, and the district payments could easily exceed the loans in times of decreased building demands. The return of all monies loaned plus any interest accumulation from state investment of in-operative funds would keep the fund intact for a future greatly needed building program. This would be a much more desirable position than if the funds were completely expended, through outright grants, for a current program.

Some would say, "Well and good, but the state does not have the surplus funds necessary to set up a revolving-fund."

The answer is that the state can find a means of providing the initial funds on a more equitable basis than the local district. The rate of interest paid by the state for loans would be far less than the sum total of the interest paid by all the districts. Regardless of the necessary mechanics involved, the buildings could be provided at a less overall cost to the people of the State of Michigan. The fact that the Federal government is discussing federal aid provides the possibility that any forthcoming federal grant could be set up on a revolving-fund basis by the state.

The revolving-fund can and should be provided. When the State of Michigan faces up to the problem that the education of its children is the direct responsibility of the state, the revolving-fund will be provided!

II. LIMITATION OF STUDIES REVIEWED

The studies reviewed provide justification for the borrowing of funds needed for additional school plant facilities. The relative merits of bonding versus some type of pay-as-you-go, as well as the various types of Michigan bonds that are available to Michigan school districts, were described in some detail. However, no specific formulae or value scales were devised to determine the best program on a particular situation for the individual school district.

It was revealed that economic cycles have had an effect upon the bonded indebtedness in the past, and that safeguards are essential to every bond program as a protection to both the buyer and the seller of bonds in the event of unusual fluctuations in the economic conditions during the life of the issue. The inherent weakness is that no one has yet succeeded in determining either the magnitude of potential economic changes or the time at which such fluctuations will occur.

Although the various types of bonds are discussed in some

detail, it is difficult, if not impossible, to determine the type of bond best suited to a particular district for the unforeseeable future. It is difficult, indeed, to obtain all of the necessary knowledge of the present; and the ability to predict, with any degree of assurance, even the probable future from such knowledge is apparently impossible. Thus, the information related here suggests possibilities and relative merits under certain conditions, but necessarily leaves decisions as to what is anticipated to be best for the local situation to the discretion of the local district.

Security can be assured only when the future has become the past. Absolute security is only a figment of the imagination, because the future can not be known. So any proposed bond program, necessarily, is developed in the light of past experiences, together with such foreseeable considerations as are believed to have merit at the particular time. Sound bonding programs can be developed in this light only by following the criteria as developed, and do not guarantee absolute security. The criteria established tends only to reduce the element of risk involved.

The state's responsibility to the debt program is established, and a program for revolving-funds is suggested. The program, no doubt, has definite potential weaknesses; but it is a means of developing a form of state building authority, in which the district would

theoretically lease-rent the building until such time as the building cost was paid by the local district. The mechanics have been intentionally deleted, because the writer feels incompetent to provide the necessary legal statutes and financial details that are necessary to make the program both feasible and practical. The sole purpose here is to relate the state's responsibility, and to suggest the possibility of such a program.

III. CONCLUDING STATEMENTS RELATIVE TO STUDIES REVIEWED

Regardless of the manifestations set forth in this study, the fact remains that under present conditions and existing statutes, schools, in order to provide needed structures, must for the most part develop some type of bonding program.

It thus becomes imperative that school administrations understand those factors that appear within the individual bond issue that have a definite bearing upon the cost of the issue, as well as those factors that affect the use of funds derived from the sale of school bonds. The lack of such material in published form necessitates a study of those factors that fall within the jurisdiction of the board of education. It is believed that the revelation of such factors, as well as the resulting known effects, will provide a criteria that will enable subsequent boards of education to develop a better bonding program.

CHAPTER III

METHODS OF PROCEDURE AND SOURCES OF DATA

This study was developed by obtaining the available literature pertaining to bonding, and by reviewing the contents to obtain a background to determine if other studies of the subject had been made.

Visits were made to the offices of the Municipal Finance Commission, Michigan Advisory Council, Berry Stevens, and Miller Canfield to obtain information concerning bond practices. Consultations were held with members of the Department of Public Instruction and Michigan State University regarding the development of the study.

A brief document was then prepared as a pilot study, in which the various factors were briefly covered to determine the course of future study. It was found that two phases needed to be covered at the onset. (1) The present position of school bond debt, and (2) the history of how we arrived at this point.

The statutes of the State of Michigan and other sources were examined to find the major legal enactments pertaining to the development of the bonding laws from the first known act in 1809 up

to the present time. These statutes provided the legal history, but they did not provide the complete story of capital outlay. It was necessary to obtain the school debt record of the State of Michigan as far back as figures were obtainable. Such records were obtained from the Municipal Finance Commission.

To obtain a true analysis of the school bond debt, the ratio of debt to valuation for the various years had to be obtained. The yearly assessments for the State of Michigan were obtained, and the ratios were computed.¹ The year 1863 was used, because it was the earliest recorded date for which figures were obtainable. Following 1863, ten year intervals were reduced to five year intervals until 1927, after which one year intervals were utilized up to and including 1955.

The census figures for the State of Michigan were obtained from the U. S. Census reports, and the Michigan school enrollment figures were obtained from the Michigan Department of Public Instruction. It was now possible to establish the per capita and per pupil debt during the period of 1863 to 1955.²

The next step was to obtain from the Municipal Finance

1 Table I, Appendix.

2 Table II, Appendix.

Commission the figures pertaining to the types of bonds issued and the amounts involved in each type. This phase of the study began with 1927 in order to reveal the effect of the depression and the resulting issuance of refunding serial and term bonds, as well as the declining use of sinking-fund bonds.³

Bond yields were determined to be an important phase of the study as related to net interest costs and to economic cycles. The national average municipal bond yields were obtained for a period of forty-one years. Some of the yields were obtained from the Municipal Bond Buyer publications, and others from the Chase Manhattan Bank of New York.⁴

The average yield was then broken down for an analysis by months of the twenty year period prior to 1956, for purposes of determining if some months generally provided better average interest rates than other months.⁵

The writer visited the Michigan Advisory Council offices, and studied numerous bond issues in that office to familiarize himself with the form and general context of the issues, as well as the

3 Table III, Appendix.

4 Table IV, Appendix.

5 Table V, Appendix.

procedures followed in developing the issues.

Issues in the amount of twenty thousand dollars or more and sold in the fiscal year beginning July 1, 1954, were selected for study. Issues consecutively passed after July 1, 1955, were added, until a total of two hundred issues were included for the analysis.

The two hundred issues were studied and analyzed according to the following: (1) what was to be constructed, (2) whether or not furnishing of buildings were included, (3) what provisions were made for site purchasing, and (4) how the issue was to be retired. Additional study was made to determine the practices followed by boards of education as related to bond denominations, retirement levy requirements, and callable features of the issues.

The average net interest rate for each issue was obtained, and a check was made to determine if the number of bids received for the issue had any effect upon the net interest cost of the issue. The issues were further analyzed to determine if the percentage of affirmative vote by which the issue had passed, bore any relationship to the number of bids received for the bond issue.

The issues were then divided into four groups: (1) issues of less than one hundred thousand dollars;⁶ (2) one hundred thousand

⁶ Table VII, Appendix.

to five hundred thousand dollars;⁷ (3) five hundred thousand to one million dollars;⁸ (4) over one million dollars;⁹ and each group was analyzed to find a point of beginning for determination of the factors that affect the average net interest cost of the issue. Dates of sale, amount of the issue and assessed valuation, were tried as methods, and none appeared to reveal any definite pattern. The ratio of school bond debt to assessed valuation was computed for each issue, and the issues were arranged according to the debt ratio. It was revealed that a definite, though not consistent, pattern existed between the debt ratio and the net interest cost of the issues.

It was then determined to change the four groups of issues into two groups comprising fewer issues and still representing an approximation from each extreme.

Those issues that had a school bond debt to assessed valuation as equalized, of 10 per cent or more, were placed in Group I.¹⁰

Those issues that had a debt to valuation ratio of 5 per cent or less

7 Table VIII, Appendix.

8 Table IX, Appendix.

9 Table X, Appendix.

10 Table XI, Appendix.

were placed in Group II.¹¹ Group I consisted of forty-eight issues, and Group II contained thirty-six issues. The eighty-four issues as a group covered the two extremes of debt ratio, and were representative of the average net interest rate scale. The issues were then used as the basis to determine the effect of other factors within the issues that caused the variations in net interest cost as related to the percentage ratio of debt to valuation.

The first portion of the study developed two phases relating to the actual selling of the bonds. The first phase is related to the marketing of the bonds. A twenty year study of the average yield of municipal bonds was made to determine if certain months of the year were generally more favorable for low interest rates than other months.¹² The second phase is concerned with the actual acceptance of the bid, and the question was asked, "Is the lowest apparent bid always the lowest actual bid under all conditions of bond retirement?"

The second portion of the study was to find the effect of the following factors upon the net interest cost of the issue:

- (1) Amount of the issue sold
- (2) Number of bond bids received

¹¹ Table XII, Appendix.

¹² Table VI, Appendix.

- (3) Ratio of taxable valuation as equalized to debt
- (4) Percentage of callable bonds
- (5) Longevity of the issue
- (6) Present debt
- (7) Previous debt record
- (8) Tax collection record
- (9) Taxable years beyond life of issue
- (10) Type of district
- (11) Percentage of affirmative vote approving bond issue
- (12) Attorneys employed
- (13) Earmarked millage
- (14) Bond opinion fees
- (15) Bond printing fees

Amount of the issues sold. The thirty-six issues with a debt ratio of 5 per cent or less, and the forty-eight issues with a debt ratio of 10 per cent or more, were studied as to the amount of the individual issue and the net interest rate received for the issue.

The issues were then selected from both groups that were in amounts of fifty thousand dollars or less. The net interest cost of these issues was compared to those issues, from both groups, that were in amounts of five hundred thousand dollars or more.

The twenty issues bearing the lowest net interest rates, and

the twenty issues having the highest net interest rates in the original 84 issues were then separated and studied as to the amounts of the issues.

Number of bids received. The twenty issues bearing the lowest interest rates and the twenty issues bearing the highest interest rates, were selected from the eighty-four issues and compared as to the number of bids received for each issue. The two groups were again reduced by using the ten lowest net interest bids and the ten highest net interest bids.

The third check on this factor was made by an analysis of the forty-four remaining issues that had not previously been used in this phase of the study.

Debt to valuation ratio. A comparison of debt to valuation ratio was made by selecting those issues, from the total two hundred issues used in the study, that had a debt ratio of more than 10 per cent or less than 5 per cent. The issues in the two groups were then compared to the net interest costs received in each group.

A second comparison was made by separating the above groups into four categories. The issues that had a debt to valuation ratio of 10 per cent or more, and exceeded the national average interest rate by one-half of one per cent, were placed in group A. Issues having a debt ratio of 10 per cent or more, but receiving a

net interest rate of less than national average, were placed in group B.¹³ Issues exceeding the national average net interest cost, but having a debt ratio of less than 5 per cent were placed in group C. Issues having a debt ratio of less than 5 per cent, and bearing interest rates less than the national average by an amount greater than one half of one per cent, were put in group D.¹⁴ These groups were then analyzed in terms of net interest costs.

Callable bonds. The percentage of callable bonds in each of the two hundred issues was computed.¹⁵ The net interest costs of the bonds were then compared to the percentage of callable bonds. A second test was made by finding the relationship of the net interest cost, and the percentage of callable bonds, in the eighty-four issues that had a debt to valuation ratio greater than 10 per cent or less than 5 per cent.

Length of issue. The mean interest rate of the eighty-four issues was determined to be 2.558 per cent. A study was then made of the longevity of the issues that exceeded the mean, as compared to the length of the issues that received interest rates below the mean.

13 Table XIII, Appendix.

14 Table XIV, Appendix.

15 Table XV, Appendix.

Debt history. Eighty-four issues were compared as to debt history and the resulting net interest cost. A further study was not made of this factor because of the multitude of implications surrounding the debt history, such as whether defaults were the fault of the district or if there were extenuating circumstances, and the evidence that this factor could not be pinpointed or isolated. Therefore, generalizations were drawn relative to the effect of debt history and resultant net interest costs.

Tax collection record. The per cent of previous tax collections were averaged for each of the eighty-four issues. The average number of years used in computing the average collection for a district was five years. The eighty-four issues were then compared as to the relationship between the percentage of tax collection of each issue and the average net interest rate obtained for the issue.

Relation of surplus taxable years. The number of years for which tax levies could be made beyond the life of the issue were calculated for each of the eighty-four issues. The median interest rate of these issues had been previously established as being 2.558 per cent. The number of surplus taxable years for those issues exceeding the median interest rate was then compared to the number of surplus taxable years in those issues bearing interest rates less than the median.

Type of district. A breakdown of the types of districts was made. The districts were classified as predominately industrial, residential, resort, and farm. The number of each classification in the eighty-four issues was determined, and each group was analyzed as to the number of the issues exceeding the interest rate of 2.558 per cent and the number that was less than the median.

Percentage of affirmative vote. Two hundred issues were analyzed to determine if a relationship existed between the percentage of affirmative vote obtained for an issue and the number of companies submitting bids for the issue.¹⁶ The bids received for each issue were then analyzed to determine if a larger number of bidders for a particular issue resulted in lower net interest rates for the issue. The selected eighty-four issues were then used for further analysis to determine if those issues that received a net interest rate of more than the median had a lower percentage of affirmative vote, and if those issues that were passed by a high percentage of affirmative vote had a net interest cost less than the median.

Attorneys employed. When a check was made of the two hundred issues, it was determined that certain legal firms appeared

16 Table XVIII, Appendix.

with more frequency than others. Secondly, it appeared that although some issues varied considerably in the mechanics of legal structure, they bore the same attorney's name. It was believed that such issues were compiled by attorneys other than the ones specified for legal opinion. The offices of legal firms, bonding companies, and the Advisory Council were contacted relative to this question. It was found that such a practice was general, and that the legal opinions of only certain firms were recognized by bonding companies. The eighty-four issues were then studied as to the practices followed in employing legal assistance in the development of the issues, and some generalizations were made.

Earmarked millage. Two hundred issues were examined to determine whether school districts generally provided for specifically earmarked millage within the bond resolutions as approved by the electorate.

The eighty-four issues were then studied as to the interest rates obtained for those issues that had failed to designate what the millage was to be used for, as compared to those that did spell out the exact use to which the collected tax monies could be put.

Bond opinion fees. The eighty-four issues were investigated to determine the general practices followed by boards of education as to whether boards of education paid the fees directly, or whether they

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were paid by the bond purchasers and reflected in the net interest cost.

The discovered methods of meeting these costs were then analyzed as to their resultant effect upon the net interest cost.

Present status of school bonding. It was the purpose here to determine the pattern of bonding subsequent to the Thirteen Mill Constitutional Amendment.

The issues were obtained that were sold during the period January 1, 1955, to January 1, 1957, and analyzed as to the number of unlimited-tax, unlimited-tax-qualified, and limited-tax bond issues sold.¹⁷

The issues were then compared as to interest rates received to determine the effect of the type of issue upon the interest rates received for the issues.¹⁸ These interest rates were then compared to the national average net interest costs and to the national average school bond interest rates for the same period.¹⁹

The total bonding program was studied in relation to the existing amendment as to its effectiveness during the short period

17 Table XXI, Appendix.

18 Table XXII, Appendix.

19 Graph I, Appendix.

that it has been in existence.

CHAPTER IV

HISTORY OF MICHIGAN BONDING

I. EVOLUTION OF PRESENT LEGAL STATUS

The magnitude of current and future school bonding programs, methods available for present day bonding as well as the manifestations involved in current capital outlays, have been discussed in the preceding chapters. The laws regulating the issuance of school bonds have been somewhat in a state of flux since the time that the State of Michigan was but an enterprizing young territory with visions of perhaps becoming a state. In order to better understand the involvements of present day school bonding, it is necessary to briefly relate the delineation of the legal acts that have been or still are in effect from the earliest recorded date up to and including the so-called Thirteen Mill Amendment.

The Governor and Judges (Northwest Territory) adopted an act in 1809 to levy a tax for the support of schools, but the act was not enforced.¹ A few years later, Augustus B. Woodward

¹ F. Clever Bald, Michigan In Four Centuries, (New York: Harper Brothers, 1954), p. 174.

1. Introduction

The purpose of this study is to investigate the effects of

the proposed method on the performance of the system. The results of the experiments are presented in the following sections. The first section describes the experimental setup, including the hardware and software configurations. The second section presents the results of the experiments, showing the performance of the system under different conditions. The third section discusses the implications of the results and the limitations of the study. The fourth section concludes the study and provides recommendations for future research.

The results of the experiments are presented in the following sections.

The first section describes the experimental setup.

provided a plan for an educational system (Catholepistemiad) to be supported through a 15 per cent increase in taxes. This plan was made a law by the Governor and Judges on August 26, 1817.² Although the system failed, it did provide an established basis of taxation for school support. In 1827, a law was passed which made provision for capital outlay, but it was not mandatory because it allowed for rejection of its provisions by a two-thirds majority vote of the qualified electors.

The Territorial School Law of 1829 "an act to provide for and regulate common schools" was the first Michigan law that made provision for the mandatory establishment of school facilities and the levying of taxes against the real property within the school district for purposes of capital outlay.³ The law of 1830 changed the authority of tax levy, in that it required that the amount of tax levy for capital outlay be duly authorized by a majority vote of the qualified electors at a legal district meeting.⁴

Some schools were organized; however they were generally supported by rate bills rather than by taxes. There were no free

2 Ibid., p. 177.

3 Laws of Michigan, 1829, Section 8, p. 58.

4 Laws of Michigan, 1830, Section 7, p. 27.

schools in Michigan until 1842, and then only in Detroit.⁵ Detroit did not open the first Michigan high school until 1844. It closed shortly thereafter, and did not reopen until 1858 with an enrollment of twenty-three boys.⁶

Although the Constitution of Michigan, adopted in 1835, provided in Article X for a system of common schools, it did not provide for free schools. It was not until April 3, 1869, that an act was passed by the legislature providing for free schools supported by taxes and state aid.⁷ In 1874, the State Supreme Court, Justice Thomas Cooley writing the opinion, upheld the validity of the tax supported school law in what became commonly known as the Kalamazoo Case.

Only eighty-three years have elapsed since the support of schools in the State of Michigan has had the sanctity of tax support through a Supreme Court decision. However, legislative acts were passed during the interim that did lend support to the public schools, and slowly modified and changed the provisions through which monies could be obtained for school capital outlay.

5 Bald, op. cit., p. 175.

6 Ibid., p. 264.

7 Ibid., p. 305.

The first Constitution of Michigan, adopted in 1835, made no specific mention of finance for capital outlay. Provisions for capital outlay, however, were implied in the general mandate to the legislature to establish a system of common schools.

The law of 1837 entitled, "An act to provide for the organization and support of primary schools," was the first school legislation enacted after Michigan became a state.⁸ It specifically limited the amount of levy for capital outlay in a primary district to five hundred dollars in any one year. It was amended in 1839 by a provision requiring a two-thirds majority of the qualified electors present at any regular qualified meeting of the school district, to approve a tax levy for capital outlay.⁹ It was further amended in 1840 by providing that no capital outlay levy could be made unless the district contained at least nine scholars between the ages of four and eighteen years.¹⁰ Further, that the levy could not exceed one hundred dollars per year unless the township primary school inspectors certified that additional revenue was needed. In that case, the levy could be raised to a maximum of

8 Laws of Michigan, 1837, Section 8, Paragraph 8, p. 117.

9 Laws of Michigan, 1839, Act No. 105, Section 7.

10 Laws of Michigan, 1840, Act No. 121, Section 7.

three hundred dollars.

In 1843, a law was passed to raise the levy for capital outlay from one hundred dollars to two hundred dollars. In 1845, it was amended to provide a levy not to exceed four dollars per child for capital outlay in those districts having more than one hundred children between the ages of four and eighteen years.¹¹

The first reference restricting the type of building that could be erected upon land with a particular type title, appears in the law of 1846, amending the act of 1843.¹² It provided for the erection of frame buildings on sites having a title in fee or at least a fifty year lease, and restricted the erection of stone or brick buildings to sites with a title in fee or a ninety-nine year lease.

The second and third Constitutions, adopted in 1850 and 1908 respectively, made no specific reference to the levying of taxes for school capital outlay. In this regard, they were like the original Constitution of 1835. They merely provided an obligation upon the legislature to maintain common schools, and gave the legislature the power to determine the method of financing said program.

11 Laws of Michigan, 1845, Act No. 69, Section 2.

12 Laws of Michigan, 1846, Act No. 134, Section 1.

The legislature, in 1861, amended the law of 1846 by providing that districts having less than thirty resident pupils between five and twenty years of age, should not exceed a tax levy of two hundred dollars for capital outlay.¹³ Districts with more than thirty but less than fifty pupils were allowed up to three hundred dollars. The law also included limitations on the amounts that could be expended for specific types of buildings, and placed restrictions as to the amounts to be expended for specific sized buildings.

In 1867, the capital outlay levy was increased to one thousand dollars for any district having more than fifty resident pupils between five and twenty years of age.¹⁴ These amounts were raised in 1881 by providing for a capital outlay of two hundred and fifty dollars with less than ten children, five hundred dollars with more than ten but less than thirty, and one thousand dollars for districts with more than thirty and less than fifty.¹⁵

Kelder states that the law of 1881 was re-enacted from time to time in subsequent years, and was maintained in effect in

13 Laws of Michigan, 1861, Act No. 176, Section 22.

14 Laws of Michigan, 1867, Act No. 34, Section 22.

15 Laws of Michigan, 1881, Act No. 164, Section 20.

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primary schools without change until 1927, when a new school code removed all limitations and permitted the capital outlay levy to be determined at the discretion of the qualified electors present and voting at the district meeting.¹⁶ Types of schools other than primary had been created during this time to meet the needs and demands. Kelder cites the following types: (1) union or graded district, (2) city school districts under special acts, (3) city school districts under general school laws, (4) township school districts, (5) consolidated or rural agricultural districts.¹⁷ During this period, some school districts used the practice of pay-as-you-go; but the districts, in general, followed a bonding program. Each bonding program had to have a special act of the legislature before the school district could issue bonds.

In 1855, a law was enacted that provided for the issuance of bonds up to fifteen thousand dollars in amount and bearing interest not to exceed 10 per cent. A two-thirds majority vote of the school district was necessary to put this law into effect, and then

16 Jacob W. Kelder, "An Analysis of Debt in the School Districts of Michigan," (unpublished Doctor's dissertation, The University of Michigan, Ann Arbor, 1936), p. 24.

17 Ibid., pp. 24-25.

only in districts having more than three hundred residents.¹⁸ The time of redemption was to be set at the time of approval.

In 1867, the 1855 law was amended to provide for an escalator ratio of membership to the amount of the bond issue.¹⁹ The law of 1855 was again amended in 1875 to permit districts, regardless of size, to issue bonds graduated in amounts from three hundred dollars with a school census of thirty, to thirty thousand dollars with a school census of over eight hundred.²⁰ It was amended again in 1881 by reducing the maximum interest rate from 10 per cent to 8 per cent.²¹

A basic change in concept occurred in the law of 1887 in that it is the first reference that assessed valuation rather than school census be utilized as a basis for issuance of school bonds.²²

A second basic change occurred in 1899 when the law of 1881 was amended to provide for a minimum of ten years duration

18 Laws of Michigan, 1855, Act No. 29.

19 Laws of Michigan, 1875, Act No. 183, Section 14.

20 Loc. cit.

21 Laws of Michigan, 1881, Act No. 164, Section 2.

22 Laws of Michigan, 1887, Act No. 56, Section 1.

for a bond issue.²³ This appears to be the first reference to any time limit on any bond issues. Further restrictions appear in evidence in the law of 1905, when it was declared that the maximum bonding limit could not exceed 5 per cent of the assessed valuation regardless of the census.²⁴ However, it loosened the restrictions by extending the possible duration of the bonds from ten to fifteen years.

The trend that followed generally made bonding easier, and restrictions tended to be lessened. In 1907, the required affirmative vote was reduced from a two-thirds majority to a simple majority.²⁵ In 1911, the percentage of bonded indebtedness was increased from 5 to 10 per cent of the assessed valuation, and increased the per capita debt from seventy-five dollars to one hundred dollars for those districts with more than one hundred children between the ages of five and twenty years.²⁶ In 1921, the bonding limitation was again increased from 10 per cent to 15 per cent of the assessed valuation, and the life of the bond issue was extended

23 Laws of Michigan, 1899, Act No. 190

24 Laws of Michigan, 1905, Act No. 270.

25 Laws of Michigan, 1907, Act No. 256.

26 Laws of Michigan, 1911, Act No. 12.

to a maximum of thirty years.²⁷

The law of 1925 began a general trend that was to be particularly common until 1955, in that it recognized that the bonding laws were too liberal.²⁸ The 1925 law provided: (1) for issuance of term and serial bonds, (2) for the management and establishing of sinking funds for payment of bonds at maturity, (3) for the reduction of the allowable rate of interest for bonding purposes to 6 per cent, and (4) for the refunding of outstanding bonds, with the provision that the refunding bonds be paid in a period not to exceed fifteen years.

The State Constitution of 1908 contained no provision relative to the issuance of public school bonds. It was amended, however, in 1932.²⁹ This action further restricted bonding, and provided a serious handicap in the building of schools. A slight change in 1948 and a major change in 1955 did alleviate the situation. The 1932 amendment provided that (1) the total tax levy on property for all purposes should not exceed 1 1/2 per cent of the assessed valuation, except that taxes required for payment of obligations incurred before

27 Laws of Michigan, 1921, Act No. 31, Section 1.

28 Laws of Michigan, 1925, Act No. 273.

29 State Constitution of Michigan, Article X, Section 27.

1932 might be levied separately, and that (2) the tax limitation could be increased in an amount not to exceed 5 per cent of the assessed valuation for all governmental units participating in the fifteen mill tax limitation, for a period not to exceed five years, when approved by a two-thirds majority vote of the qualified electors at a regular or special meeting.

The efforts of the legislature to protect the taxpayer still further during the early 1930's, is evidenced by the 1933 Property Tax Limitation Act.³⁰ The act (1) created the allocation board, (2) provided the mechanics for controlling and enforcing the fifteen mill constitutional amendment, and (3) established specific minimums of millage that the county, township, and schools could demand from the allocation board.

Because the schools were assured of only four mills, under this act, for purposes of operation and capital outlay, two new concepts were in evidence in the period of 1932 to 1941.

The first concept was the new interest of the bond purchasers in the operating funds of the school. Bonds were the obligation of the school district, and could be paid from the operation funds. The operation funds were now dependent upon the decision of the allocation

30 Public Acts of Michigan, 1933, Act No. 62.

board, in terms of the budgets submitted, but not necessarily determined solely by the school budget.

The second concept was that school bonds could, if financed within the fifteen mill allocation, be issued for a duration of thirty years; but if they were financed under the provisions of Article X, Section 21, of the State Constitution, the bonds could be issued for a duration of only five years.

However, all was not restriction in the year of 1933. The legislature did provide for the issuance of revenue bonds, which offered a new avenue for raising money to purchase, acquire, construct, improve, extend, or repair and own and operate, revenue producing public improvements.³¹ Such revenue bonds were payable solely from the revenue derived therefrom, and they were of little use to schools because of the limited number of revenue producing possibilities.

In 1935, further action was taken to ease the burden on the taxpayer by an amendment to Act 13 of Public Acts of 1932.³² The amendment provided: (1) that with the permission of the commission, the municipality might refund its unmatured bonded indebtedness in

31 Public Acts of Michigan, 1933, Act No. 39, p. 129.

32 Public Acts of Michigan, 1935, Act No. 42, p. 67.

whole or in part for the purpose of reducing the interest rate thereon, where the evidences of such indebtedness are subject to redemption or retirement prior to the maturity date thereof. Refunding under this section was limited to the refunding of bonds or notes issued prior to March 1, 1935; (2) that the money received from the sale thereof shall be deposited in a duly qualified bank or trust company, designated by the governing body of the municipality, in a special trust account for the payment of the outstanding refunded bonds and for no other purpose; and (3) that certificates of indebtedness might be issued for the purpose of refunding in full, interest maturing during the calendar years 1931 to 1934, inclusive.

Further evidence of the hardship existing in the early thirties, and the resulting inability to meet bond obligations, is revealed in the act to provide municipalities with the authority to proceed under the federal municipal debt adjustment act, thereby providing a means to secure readjustment of the municipality debts.³³

A second act, adopted in 1935, is of particular importance to all school treasurers, and was enacted as a result of some school treasurers' misuse of school funds.³⁴ It amended Section 43B of

33 Public Acts of Michigan, 1935, Act No. 53, p. 83.

34 Public Acts of Michigan, 1935, Act No. 93, p. 148.

Act No. 206, Public Acts of 1893, and provided that the school treasurer be rendered liable for any loss occasioned by failure to deposit funds in a depository designated by resolution.

A third act, passed in 1941, amended Section 13 of Chapter 9 of Act No. 314, Public Acts of 1915.³⁵ It provided that the actions upon bonds which are the direct or indirect obligation of the school district be brought within ten years after the respective causes of such action were proved, but not afterwards.

By the early 1940's, a period of prosperity was well under way, and school enrollments were increasing to the point that they no longer could be housed. The twenty year period of practically no new school construction had resulted in a definite building shortage. However, needed new construction was still handicapped because of the limited time for which bonds could be offered outside of the fifteen mill limitation.

At the November, 1948, election, the voters of Michigan amended the fifteen mill constitutional tax law by (1) increasing the time limitation for which increased taxes could be levied from five years to twenty years, and (2) substituting a single majority vote for

³⁵ Public Acts of Michigan, 1941, Act No. 73, Chapter 9, p. 90.

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the ninety-eighth is the fact that the
the ninety-ninth is the fact that the
the hundredth is the fact that the

the previously required two-thirds majority.³⁶ This act greatly relieved the restricted conditions under which school bonds could be issued. Several problems, however, still existed, and, if a school district were to receive a favorable rate of interest, the following provisions had to be made: (1) the district must vote a tax increase large enough to provide liberal allowances for tax delinquency, (2) the tax increase should be voted for several years beyond the final maturity date of the proposed bond issue, and (3) the district must establish a reserve fund equal to at least one year's principal and interest requirements.³⁷

Although the change in the fifteen mill amendment was a help, it did not go far enough. Rapid population growths in some areas resulted in decreased per capita valuations, because of the fact that industrial development did not keep pace with residential growth. Further, the continued erection of new school facilities and the resulting increase in bonded indebtedness soon placed many districts in a position that they could not float any new bond issues.

To relieve this situation, the people of the State of Michigan

³⁶ State Constitution of Michigan, Article X, Section 21.

³⁷ Paper presented at Conference of County Superintendents, Lansing, January 19, 1949, by Louis Schimmel, Director of Municipal Advisory Council of Michigan, Detroit 26, Michigan.

1. $\frac{1}{2} \log \frac{1}{2} = -\frac{1}{2} \log 2 = -\frac{1}{2} \times 0.3010 = -0.1505$
 2. $\frac{1}{4} \log \frac{1}{4} = -\frac{1}{4} \log 4 = -\frac{1}{4} \times 0.6021 = -0.1505$
 3. $\frac{1}{8} \log \frac{1}{8} = -\frac{1}{8} \log 8 = -\frac{1}{8} \times 0.9031 = -0.1129$
 4. $\frac{1}{16} \log \frac{1}{16} = -\frac{1}{16} \log 16 = -\frac{1}{16} \times 1.2041 = -0.0753$
 5. $\frac{1}{32} \log \frac{1}{32} = -\frac{1}{32} \log 32 = -\frac{1}{32} \times 1.5051 = -0.0469$
 6. $\frac{1}{64} \log \frac{1}{64} = -\frac{1}{64} \log 64 = -\frac{1}{64} \times 1.8062 = -0.0282$
 7. $\frac{1}{128} \log \frac{1}{128} = -\frac{1}{128} \log 128 = -\frac{1}{128} \times 2.1072 = -0.0164$
 8. $\frac{1}{256} \log \frac{1}{256} = -\frac{1}{256} \log 256 = -\frac{1}{256} \times 2.4082 = -0.0094$
 9. $\frac{1}{512} \log \frac{1}{512} = -\frac{1}{512} \log 512 = -\frac{1}{512} \times 2.7093 = -0.0053$
 10. $\frac{1}{1024} \log \frac{1}{1024} = -\frac{1}{1024} \log 1024 = -\frac{1}{1024} \times 3.0103 = -0.0029$
 11. $\frac{1}{2048} \log \frac{1}{2048} = -\frac{1}{2048} \log 2048 = -\frac{1}{2048} \times 3.3113 = -0.0016$
 12. $\frac{1}{4096} \log \frac{1}{4096} = -\frac{1}{4096} \log 4096 = -\frac{1}{4096} \times 3.6123 = -0.0009$
 13. $\frac{1}{8192} \log \frac{1}{8192} = -\frac{1}{8192} \log 8192 = -\frac{1}{8192} \times 3.9133 = -0.0005$
 14. $\frac{1}{16384} \log \frac{1}{16384} = -\frac{1}{16384} \log 16384 = -\frac{1}{16384} \times 4.2143 = -0.0003$
 15. $\frac{1}{32768} \log \frac{1}{32768} = -\frac{1}{32768} \log 32768 = -\frac{1}{32768} \times 4.5153 = -0.0001$
 16. $\frac{1}{65536} \log \frac{1}{65536} = -\frac{1}{65536} \log 65536 = -\frac{1}{65536} \times 4.8163 = -0.0000$
 17. $\frac{1}{131072} \log \frac{1}{131072} = -\frac{1}{131072} \log 131072 = -\frac{1}{131072} \times 5.1173 = -0.0000$
 18. $\frac{1}{262144} \log \frac{1}{262144} = -\frac{1}{262144} \log 262144 = -\frac{1}{262144} \times 5.4183 = -0.0000$
 19. $\frac{1}{524288} \log \frac{1}{524288} = -\frac{1}{524288} \log 524288 = -\frac{1}{524288} \times 5.7193 = -0.0000$
 20. $\frac{1}{1048576} \log \frac{1}{1048576} = -\frac{1}{1048576} \log 1048576 = -\frac{1}{1048576} \times 6.0203 = -0.0000$
 21. $\frac{1}{2097152} \log \frac{1}{2097152} = -\frac{1}{2097152} \log 2097152 = -\frac{1}{2097152} \times 6.3213 = -0.0000$
 22. $\frac{1}{4194304} \log \frac{1}{4194304} = -\frac{1}{4194304} \log 4194304 = -\frac{1}{4194304} \times 6.6223 = -0.0000$
 23. $\frac{1}{8388608} \log \frac{1}{8388608} = -\frac{1}{8388608} \log 8388608 = -\frac{1}{8388608} \times 6.9233 = -0.0000$
 24. $\frac{1}{16777216} \log \frac{1}{16777216} = -\frac{1}{16777216} \log 16777216 = -\frac{1}{16777216} \times 7.2243 = -0.0000$
 25. $\frac{1}{33554432} \log \frac{1}{33554432} = -\frac{1}{33554432} \log 33554432 = -\frac{1}{33554432} \times 7.5253 = -0.0000$
 26. $\frac{1}{67108864} \log \frac{1}{67108864} = -\frac{1}{67108864} \log 67108864 = -\frac{1}{67108864} \times 7.8263 = -0.0000$
 27. $\frac{1}{134217728} \log \frac{1}{134217728} = -\frac{1}{134217728} \log 134217728 = -\frac{1}{134217728} \times 8.1273 = -0.0000$
 28. $\frac{1}{268435456} \log \frac{1}{268435456} = -\frac{1}{268435456} \log 268435456 = -\frac{1}{268435456} \times 8.4283 = -0.0000$
 29. $\frac{1}{536870912} \log \frac{1}{536870912} = -\frac{1}{536870912} \log 536870912 = -\frac{1}{536870912} \times 8.7293 = -0.0000$
 30. $\frac{1}{1073741824} \log \frac{1}{1073741824} = -\frac{1}{1073741824} \log 1073741824 = -\frac{1}{1073741824} \times 9.0303 = -0.0000$
 31. $\frac{1}{2147483648} \log \frac{1}{2147483648} = -\frac{1}{2147483648} \log 2147483648 = -\frac{1}{2147483648} \times 9.3313 = -0.0000$
 32. $\frac{1}{4294967296} \log \frac{1}{4294967296} = -\frac{1}{4294967296} \log 4294967296 = -\frac{1}{4294967296} \times 9.6323 = -0.0000$
 33. $\frac{1}{8589934592} \log \frac{1}{8589934592} = -\frac{1}{8589934592} \log 8589934592 = -\frac{1}{8589934592} \times 9.9333 = -0.0000$
 34. $\frac{1}{17179869184} \log \frac{1}{17179869184} = -\frac{1}{17179869184} \log 17179869184 = -\frac{1}{17179869184} \times 10.2343 = -0.0000$
 35. $\frac{1}{34359738368} \log \frac{1}{34359738368} = -\frac{1}{34359738368} \log 34359738368 = -\frac{1}{34359738368} \times 10.5353 = -0.0000$
 36. $\frac{1}{68719476736} \log \frac{1}{68719476736} = -\frac{1}{68719476736} \log 68719476736 = -\frac{1}{68719476736} \times 10.8363 = -0.0000$
 37. $\frac{1}{137438953472} \log \frac{1}{137438953472} = -\frac{1}{137438953472} \log 137438953472 = -\frac{1}{137438953472} \times 11.1373 = -0.0000$
 38. $\frac{1}{274877906944} \log \frac{1}{274877906944} = -\frac{1}{274877906944} \log 274877906944 = -\frac{1}{274877906944} \times 11.4383 = -0.0000$
 39. $\frac{1}{549755813888} \log \frac{1}{549755813888} = -\frac{1}{549755813888} \log 549755813888 = -\frac{1}{549755813888} \times 11.7393 = -0.0000$
 40. $\frac{1}{1099511627776} \log \frac{1}{1099511627776} = -\frac{1}{1099511627776} \log 1099511627776 = -\frac{1}{1099511627776} \times 12.0403 = -0.0000$
 41. $\frac{1}{2199023255552} \log \frac{1}{2199023255552} = -\frac{1}{2199023255552} \log 2199023255552 = -\frac{1}{2199023255552} \times 12.3413 = -0.0000$
 42. $\frac{1}{4398046511104} \log \frac{1}{4398046511104} = -\frac{1}{4398046511104} \log 4398046511104 = -\frac{1}{4398046511104} \times 12.6423 = -0.0000$
 43. $\frac{1}{8796093022208} \log \frac{1}{8796093022208} = -\frac{1}{8796093022208} \log 8796093022208 = -\frac{1}{8796093022208} \times 12.9433 = -0.0000$
 44. $\frac{1}{17592186044416} \log \frac{1}{17592186044416} = -\frac{1}{17592186044416} \log 17592186044416 = -\frac{1}{17592186044416} \times 13.2443 = -0.0000$
 45. $\frac{1}{35184372088832} \log \frac{1}{35184372088832} = -\frac{1}{35184372088832} \log 35184372088832 = -\frac{1}{35184372088832} \times 13.5453 = -0.0000$
 46. $\frac{1}{70368744177664} \log \frac{1}{70368744177664} = -\frac{1}{70368744177664} \log 70368744177664 = -\frac{1}{70368744177664} \times 13.8463 = -0.0000$
 47. $\frac{1}{140737488355328} \log \frac{1}{140737488355328} = -\frac{1}{140737488355328} \log 140737488355328 = -\frac{1}{140737488355328} \times 14.1473 = -0.0000$
 48. $\frac{1}{281474976710656} \log \frac{1}{281474976710656} = -\frac{1}{281474976710656} \log 281474976710656 = -\frac{1}{281474976710656} \times 14.4483 = -0.0000$
 49. $\frac{1}{562949953421312} \log \frac{1}{562949953421312} = -\frac{1}{562949953421312} \log 562949953421312 = -\frac{1}{562949953421312} \times 14.7493 = -0.0000$
 50. $\frac{1}{1125899906842624} \log \frac{1}{1125899906842624} = -\frac{1}{1125899906842624} \log 1125899906842624 = -\frac{1}{1125899906842624} \times 15.0503 = -0.0000$
 51. $\frac{1}{2251799813685248} \log \frac{1}{2251799813685248} = -\frac{1}{2251799813685248} \log 2251799813685248 = -\frac{1}{2251799813685248} \times 15.3513 = -0.0000$
 52. $\frac{1}{4503599627370496} \log \frac{1}{4503599627370496} = -\frac{1}{4503599627370496} \log 4503599627370496 = -\frac{1}{4503599627370496} \times 15.6523 = -0.0000$
 53. $\frac{1}{9007199254740992} \log \frac{1}{9007199254740992} = -\frac{1}{9007199254740992} \log 9007199254740992 = -\frac{1}{9007199254740992} \times 15.9533 = -0.0000$
 54. $\frac{1}{18014398509481984} \log \frac{1}{18014398509481984} = -\frac{1}{18014398509481984} \log 18014398509481984 = -\frac{1}{18014398509481984} \times 16.2543 = -0.0000$
 55. $\frac{1}{36028797018963968} \log \frac{1}{36028797018963968} = -\frac{1}{36028797018963968} \log 36028797018963968 = -\frac{1}{36028797018963968} \times 16.5553 = -0.0000$
 56. $\frac{1}{72057594037927936} \log \frac{1}{72057594037927936} = -\frac{1}{72057594037927936} \log 72057594037927936 = -\frac{1}{72057594037927936} \times 16.8563 = -0.0000$
 57. $\frac{1}{144115188075855872} \log \frac{1}{144115188075855872} = -\frac{1}{144115188075855872} \log 144115188075855872 = -\frac{1}{144115188075855872} \times 17.1573 = -0.0000$
 58. $\frac{1}{288230376151711744} \log \frac{1}{288230376151711744} = -\frac{1}{288230376151711744} \log 288230376151711744 = -\frac{1}{288230376151711744} \times 17.4583 = -0.0000$
 59. $\frac{1}{576460752303423488} \log \frac{1}{576460752303423488} = -\frac{1}{576460752303423488} \log 576460752303423488 = -\frac{1}{576460752303423488} \times 17.7593 = -0.0000$
 60. $\frac{1}{1152921504606846976} \log \frac{1}{1152921504606846976} = -\frac{1}{1152921504606846976} \log 1152921504606846976 = -\frac{1}{1152921504606846976} \times 18.0603 = -0.0000$
 61. $\frac{1}{2305843009213693952} \log \frac{1}{2305843009213693952} = -\frac{1}{2305843009213693952} \log 2305843009213693952 = -\frac{1}{2305843009213693952} \times 18.3613 = -0.0000$
 62. $\frac{1}{4611686018427387904} \log \frac{1}{4611686018427387904} = -\frac{1}{4611686018427387904} \log 4611686018427387904 = -\frac{1}{4611686018427387904} \times 18.6623 = -0.0000$
 63. $\frac{1}{9223372036854775808} \log \frac{1}{9223372036854775808} = -\frac{1}{9223372036854775808} \log 9223372036854775808 = -\frac{1}{9223372036854775808} \times 18.9633 = -0.0000$
 64. $\frac{1}{18446744073709551616} \log \frac{1}{18446744073709551616} = -\frac{1}{18446744073709551616} \log 18446744073709551616 = -\frac{1}{18446744073709551616} \times 19.2643 = -0.0000$
 65. $\frac{1}{36893488147419103232} \log \frac{1}{36893488147419103232} = -\frac{1}{36893488147419103232} \log 36893488147419103232 = -\frac{1}{36893488147419103232} \times 19.5653 = -0.0000$
 66. $\frac{1}{73786976294838206464} \log \frac{1}{73786976294838206464} = -\frac{1}{73786976294838206464} \log 73786976294838206464 = -\frac{1}{73786976294838206464} \times 19.8663 = -0.0000$
 67. $\frac{1}{147573952589676412928} \log \frac{1}{147573952589676412928} = -\frac{1}{147573952589676412928} \log 147573952589676412928 = -\frac{1}{147573952589676412928} \times 20.1673 = -0.0000$
 68. $\frac{1}{295147905179352825856} \log \frac{1}{295147905179352825856} = -\frac{1}{295147905179352825856} \log 295147905179352825856 = -\frac{1}{295147905179352825856} \times 20.4683 = -0.0000$
 69. $\frac{1}{590295810358705651712} \log \frac{1}{590295810358705651712} = -\frac{1}{590295810358705651712} \log 590295810358705651712 = -\frac{1}{590295810358705651712} \times 20.7693 = -0.0000$
 70. $\frac{1}{1180591620717411303424} \log \frac{1}{1180591620717411303424} = -\frac{1}{1180591620717411303424} \log 1180591620717411303424 = -\frac{1}{1180591620717411303424} \times 21.0703 = -0.0000$
 71. $\frac{1}{2361183241434822606848} \log \frac{1}{2361183241434822606848} = -\frac{1}{2361183241434822606848} \log 2361183241434822606848 = -\frac{1}{2361183241434822606848} \times 21.3713 = -0.0000$
 72. $\frac{1}{4722366482869645213696} \log \frac{1}{4722366482869645213696} = -\frac{1}{4722366482869645213696} \log 4722366482869645213696 = -\frac{1}{4722366482869645213696} \times 21.6723 = -0.0000$
 73. $\frac{1}{9444732965739290427392} \log \frac{1}{9444732965739290427392} = -\frac{1}{9444732965739290427392} \log 9444732965739290427392 = -\frac{1}{9444732965739290427392} \times 21.9733 = -0.0000$
 74. $\frac{1}{18889465931478580854784} \log \frac{1}{18889465931478580854784} = -\frac{1}{18889465931478580854784} \log 18889465931478580854784 = -\frac{1}{18889465931478580854784} \times 22.2743 = -0.0000$
 75. $\frac{1}{37778931862957161709568} \log \frac{1}{37778931862957161709568} = -\frac{1}{37778931862957161709568} \log 37778931862957161709568 = -\frac{1}{37778931862957161709568} \times 22.5753 = -0.0000$
 76. $\frac{1}{75557863725914323419136} \log \frac{1}{75557863725914323419136} = -\frac{1}{75557863725914323419136} \log 75557863725914323419136 = -\frac{1}{75557863725914323419136} \times 22.8763 = -0.0000$
 77. $\frac{1}{151115727451828646838272} \log \frac{1}{151115727451828646838272} = -\frac{1}{151115727451828646838272} \log 151115727451828646838272 = -\frac{1}{151115727451828646838272} \times 23.1773 = -0.0000$
 78. $\frac{1}{302231454903657293676544} \log \frac{1}{302231454903657293676544} = -\frac{1}{302231454903657293676544} \log 302231454903657293676544 = -\frac{1}{302231454903657293676544} \times 23.4783 = -0.0000$
 79. $\frac{1}{604462909807314587353088} \log \frac{1}{604462909807314587353088} = -\frac{1}{604462909807314587353088} \log 604462909807314587353088 = -\frac{1}{604462909807314587353088} \times 23.7793 = -0.0000$
 80. $\frac{1}{1208925819614629174706176} \log \frac{1}{1208925819614629174706176} = -\frac{1}{1208925819614629174706176} \log 1208925819614629174706176 = -\frac{1}{1208925819614629174706176} \times 24.0803 = -0.0000$
 81. $\frac{1}{2417851639229258349412352} \log \frac{1}{2417851639229258349412352} = -\frac{1}{2417851639229258349412352} \log 2417851639229258349412352 = -\frac{1}{2417851639229258349412352} \times 24.3813 = -0.0000$
 82. $\frac{1}{4835703278458516698824704} \log \frac{1}{4835703278458516698824704} = -\frac{1}{4835703278458516698824704} \log 4835703278458516698824704 = -\frac{1}{4835703278458516698824704} \times 24.6823 = -0.0000$
 83. $\frac{1}{9671406556917033397649408} \log \frac{1}{9671406556917033397649408} = -\frac{1}{9671406556917033397649408} \log 9671406556917033397649408 = -\frac{1}{9671406556917033397649408} \times 24.9833 = -0.0000$
 84. $\frac{1}{19342813113834066795298816} \log \frac{1}{19342813113834066795298816} = -\frac{1}{19342813113834066795298816} \log 19342813113834066795298816 = -\frac{1}{19342813113834066795298816} \times 25.2843 = -0.0000$
 85. $\frac{1}{38685626227668133590597632} \log \frac{1}{38685626227668133590597632} = -\frac{1}{38685626227668133590597632} \log 38685626227668133590597632 = -\frac{1}{38685626227668133590597632} \times 25.5853 = -0.0000$
 86. $\frac{1}{77371252455336267181195264} \log \frac{1}{77371252455336267181195264} = -\frac{1}{77371252455336267181195264} \log 77371252455336267181195264 = -\frac{1}{77371252455336267181195264} \times 25.8863 = -0.0000$
 87. $\frac{1}{154742504910672534362390528} \log \frac{1}{154742504910672534362390528} = -\frac{1}{154742504910672534362390528} \log 154742504910672534362390528 = -\frac{1}{154742504910672534362390528} \times 26.1873 = -0.0000$
 88. $\frac{1}{309485009821345068724781056} \log \frac{1}{309485009821345068724781056} = -\frac{1}{309485009821345068724781056} \log 309485009821345068724781056 = -\frac{1}{309485009821345068724781056} \times 26.4883 = -0.0000$
 89. $\frac{1}{618970019642690137449562112} \log \frac{1}{618970019642690137449562112} = -\frac{1}{618970019642690137449562112} \log 618970019642690137449562112 = -\frac{1}{618970019642690137449562112} \times 26.7893 = -0.0000$
 90. $\frac{1}{1237940039285380274899124224} \log \frac{1}{1237940039285380274899124224} = -\frac{1}{1237940039285380274899124224} \log 1237940039285380274899124224 = -\frac{1}{1237940039285380274899124224} \times 27.0903 = -0.0000$
 91. $\frac{1}{2475880078570760549798248448} \log \frac{1}{2475880078570760549798248448} = -\frac{1}{2475880078570760549798248448} \log 2475880078570760549798248448 = -\frac{1}{2475880078570760549798248448} \times 27.3913 = -0.0000$
 92. $\frac{1}{4951760157141521099596496896} \$

again amended the Constitution on April 4, 1955.³⁸ The new amendment provided:

1. That the state could borrow monies not to exceed one hundred million dollars for the purpose of making loans to be used by the districts for payment of principal and interest on school bonds.

2. That the conditions under which the state shall loan money to a school district and the conditions under which the school shall repay the loan to the state be as follows:

(a) In any calendar year that a school district is required to levy more than thirteen mills on its state equalized valuation for the payment of the principal and interest on its bonds (present and future bonds), the State of Michigan shall loan the district the amount of the excess over the thirteen mill levy. (Total aggregate amount the State can loan to all school districts over the life of this amendment is limited to one hundred million dollars.)

(b) After a school district has received a loan or loans from the State, the district each year thereafter shall continue to levy not less than thirteen mills on its state equalized valuation until the amount loaned by the state has been repaid. Whenever the thirteen mill levy produces more than enough to pay the annual principal and interest on the bonds of the district, the excess must be used toward the repayment of the state loan.

3. That all school district bonds issued after the effective

38 State Constitution of Michigan, Article X, Section 27.

date of this amendment and prior to July 1, 1962, -- if such bonds mature in not less than twenty-five years from date of issue -- should be payable from taxes without limitation as to rate or amount. This removes from such bonds the tax restrictions imposed by the fifteen mill constitutional amendment, and permits a school district to finance a bond issue over a period up to the legal limit of thirty years.

This last constitutional amendment may have permitted schools to arrange their financing programs on a more realistic and reasonable basis. Only time can reveal its true effect. It did provide a means for schools to get further in debt, and to project the debt over a longer period of time. Just how effective the amendment is functioning will be treated in a later chapter in this study.

II. HISTORY OF SCHOOL BOND INDEBTEDNESS, 1863 -- 1955

Although the history of Michigan school bonded indebtedness as well as the history of municipal bond yields are closely allied to the evolution of the legal statutes governing the issuance of school bonds, it is believed that they can each be best understood by relating them separately and subsequent to the preceding section.

In 1863, the gross school bonded debt was a mere \$112,266, a debt equivalent to .0007 of the state's assessed valuation.³⁹ The

39 Table I, Appendix.

per capita wealth in this period was \$183.00, while the per capita debt was only thirteen cents.⁴⁰

The bonded debt steadily increased until 1931, when it reached a peak of \$188,465,101, and the ratio to bonded debt to assessed valuation had increased to .0239.⁴¹ The state population had increased during this period from \$861,000 to \$4,792,000, and the per capita wealth had increased to \$1,637.⁴² The per capita debt had increased to \$39.29, and the per pupil debt had increased to \$179.92.

The 1929 stock market crash and the ensuing depression years resulted in issuance of refunding bonds as well as a steady decline of school bonded indebtedness.⁴³ The taxpayers who had previously supported bond issues were now reluctant to give their approval. The legislative action of 1932, in adopting the commonly called fifteen mill amendment, had further restricted the ability of the schools to secure public approval by raising the requirements of popular vote and reducing the term of the bond issue.

40 Table II, Appendix.

41 Table I, Appendix.

42 Table II, Appendix.

43 Table III, Appendix.

By 1948, the total gross school bond debt had been reduced to \$88,495,745.⁴⁴ The per capita debt had dropped to \$14.33, while the per pupil debt reached a new low of \$88.76.⁴⁵

School enrollments followed a different pattern, in that they had shown a steady increase until 1932, when a high of 1,049,505 pupils were enrolled in Michigan public schools.⁴⁶ Membership in the public schools decreased more than 91,000 between the years 1932 to 1933; and a steady decrease followed through 1937, when a new low of 942,328 enrollees was reached.⁴⁷ In 1938, enrollments again began an upward trend, and except for a minor reduction during the war years of 1941 to 1945, continued to rise until the previous peak was passed in 1951, and a new high was attained by 1955 of 1,296,558.⁴⁸

Antiquated buildings, prosperous times, and the increasing enrollments was reflected in an upsurge in the construction of improved school facilities. In the period from 1949 to 1950, the gross

44 Table I, Appendix.

45 Table II, Appendix.

46 Loc. cit.

47 Loc. cit.

48 Loc. cit.

school bonded indebtedness increased over \$43,000,000, and by 1955 it had attained the staggering height of nearly \$350,000,000.⁴⁹ The indebtedness now stood at \$46.47 per capita, and \$259.46 per enrolled pupil.⁵⁰

At the time of this writing it would appear that the bonding debt would continue to rise considerably in the ensuing years due to the continually increasing costs of construction, the backlog of needed facilities (only one-third of children being satisfactorily housed) the increasing birth rates, and the increased holding power of the schools.⁵¹

It is significant to note that although the per capita debt has reached a new high of \$46.47, the ratio of bond debt to assessed valuation is much less than it was in 1934.⁵² Today there is a considerable demand by the public for federal aid to provide the needed school construction, because it is believed that the school debt is so large that it is impossible to provide facilities through local channels. Yet debt ratios reveal that Michigan today

49 Table III, Appendix.

50 Table II, Appendix.

51 Clair L. Taylor, So Many Children, (Department of Public Instruction).

52 Table I, Appendix.

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is better able to take care of its school bonded debt than it was in 1934.

III. MUNICIPAL BOND YIELD HISTORY

In the early part of the twentieth century, the average bond yield was well over 4 per cent.⁵³ Bond yields increased with World War I, and reached a high of 5.08 per cent shortly after the war ended.⁵⁴ The bond market generally softened in the 1920's with a gradually decreasing bond yield until the stock market crash in 1929. In fact, bond yields continued to fall through the years 1930-31.⁵⁵

The period of 1931 to 1935 witnessed very little reduction in interest rates. The market was extremely small, as practically no new bonds were offered for sale. However, offsetting the advantage of limited marketable sales, was the tax collection delinquency rate and the resultant inability of the schools to meet principal and interest payments. It was not uncommon for a school district to receive as little as 10 per cent in non-delinquent tax collections on

53 Table IV, Appendix.

54 Loc. cit.

55 Loc. cit.

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a current levy.

A period of refunding followed legislation of 1935, and school districts began to recover from their financial distress. This was particularly true as many districts changed from term to serial refunding bonds.⁵⁶

In the years 1931 to 1948 the school bond debt was reduced from \$180,000,000 to \$88,000,000.⁵⁷ Accompanying the reduction of debt was a very noticeable, though not parallel, decline in bond interest rates. The drop in rates was without doubt accelerated by (1) the lack of new issues on the market, (2) stabilization of school debt, (3) improved prosperity, (4) general easing of credit restrictions.

In 1949, the trend changed.⁵⁸ (1) Money tightened slightly, (2) stocks were a little more desirable than bonds, (3) schools were offering an accelerating number of new bond issues, (4) the bonded debt began to rise very rapidly.

By 1955 the bonded school debt had reached \$336,000,000.⁵⁹

⁵⁶ Table III, Appendix.

⁵⁷ Table I, Appendix.

⁵⁸ Loc. cit.

⁵⁹ Table III, Appendix.

Some bonds were now demanding interest rates from 3 per cent to over 4 per cent interest, and many sellers of bonds were unable to find buyers.⁶⁰

The preceding paragraphs point out that interest rates do vary, and that the variance generally follows (1) economic cycles, (2) supply and demand, and (3) estimated risk.

⁶⁰ Table XVIII, Appendix.

CHAPTER V

GENERAL CHARACTERISTICS OF BOND ISSUES AND THEIR EFFECTS

The need for school bonding has been established, and the history of Michigan school bonding has been briefly reviewed. The next phase in the appraisal of Michigan public school bonding practices is the study of those provisions that are incorporated within the bond issue itself. This phase of the study was believed necessary by the writer because school boards are often negligent in determining specifically the terms of the bond issue. Further, the content of the issue is often not thoroughly understood until it becomes expedient to alter the original plans. Inevitably, at that time, the board of education discovers in many cases that it can not make the change within the provisions of the issue.

Two hundred issues bearing bond sale dates between July 1, 1954, and July 20, 1955, were examined as to their flexibility within the bond issues, determining if boards of education provided themselves with sufficient latitude for possible emergencies or expedient variation. It was found that two hundred of the issues provided for buildings, 182 for buildings and furnishings, while only sixty-six provided for buildings, furnishings, and

site.¹

It was revealed that 143 provided no means of acquiring additional sites or for changing the building provisions. Eight issues were limited to the degree that they could make no changes of any kind. For example, a bond issue might call for the erection of four classrooms to a specific school. Several things could suddenly happen that would cause a board to change its original plan. (1) Cost of construction might exceed the architect's estimate, and only three rooms could be constructed. (2) Surplus funds could remain after building or buildings are erected, and with this surplus the board is desirous of building additional rooms. (3) Population shifts, increases, or decreases might make it feasible to erect additions on a different building or possibly on a different site. (4) The board might build the additions as stated, and find that they have surplus funds with which to provide an additional site for future construction; or they might be desirous of providing necessary playground equipment, furniture, educational equipment, janitorial equipment, etc. Other possibilities could be suggested, but these are sufficient to point out that not one of the alternates could be utilized no matter how feasible that alternate

1 Table XVI, Appendix.

might be. The bond issue provides specifically for four classrooms on a certain building, and no matter how valid the reason for change, the board has no legal right to do anything other than that which the issue spells out.

Twenty-two of the issues examined did provide that the board of education could acquire additional lands for site purposes over and beyond the immediate building site. Eighteen issues provided for varying degrees of latitude in the number and type of schools to be constructed. These issues varied in phraseology from "a specific addition to a specific building" to "erect and furnish additional school facilities." Fifteen issues provided varying degrees of flexibility in the purchasing of sites as well as in the erection of facilities. The terminology varied in these issues from "erect additions and acquire additional sites" to "erecting additional school facilities either as new buildings or additions to existing buildings and acquiring additional school sites."

One hundred eighty-two issues did provide for furnishings, which means that those districts can, within the terms of the bond issue, provide the building with the necessary equipment and supplies to operate it. Such equipment is limited not only to furniture, laboratory equipment, etc., but may also include such items as library books, typewriters, maps, globes, and visual aids.

Unfortunately, an architect sometimes underestimates the cost of the potential building or buildings, which results in a lack of funds for furnishings even though the provisions were included in the bond issue. This experience is an unfortunate one for the school district because the district has the additional expense of reducing the cost of structure through (1) the negotiation and reduction of facilities, (2) the cost of rebidding a revised building program, (3) the reduction of equipment and supplies, (4) or paying for the equipment and supplies out of general operating funds, which in most cases are already seriously depleted.

Therefore, it must be pointed out that it is imperative that boards of education should not only provide a means for furnishings within the issue, but must also provide an issue large enough to meet the financial costs of furnishings as well as buildings.

The effect of flexibility on obtaining affirmative acceptance for the issue. It is believed by some that the issue must spell out exactly what the board of education is going to do with the funds, or else the people will not support the bond issue and popular vote approval would be improbable. Obviously, some particular phase of a bond issue, such as the construction of a swimming pool or the erection of an auditorium, for example, might contribute to the defeat of a bond issue. This could be true if the public did not have

The first part of the paper discusses the importance of understanding the underlying mechanisms of the observed phenomena. It is argued that a comprehensive understanding of the system requires a detailed analysis of the various factors that influence its behavior. This involves identifying the key variables and their interactions, as well as developing a theoretical framework that can explain the observed results.

In the second part, the authors present a series of experiments designed to test the proposed model. These experiments involve varying the input parameters and measuring the resulting output. The results show that the model accurately predicts the behavior of the system across a wide range of conditions. This provides strong evidence for the validity of the proposed theory.

The third part of the paper discusses the implications of the findings for future research. It is suggested that further studies should be conducted to explore the limits of the model and to investigate the underlying mechanisms in more detail. This will help to refine the theory and provide a more complete understanding of the system.

Finally, the authors conclude by summarizing the main findings of the paper. They emphasize the importance of understanding the underlying mechanisms of the observed phenomena and the need for further research in this area. The paper provides a clear and concise summary of the work and its contributions to the field.

sufficient confidence in the school administration, or if the public had not been sufficiently prepared as to why such facilities were needed. This, however, is quite different from the matter of providing flexibility within the issue, and the issue would be defeated generally under the above circumstances regardless of the flexibility or lack of the same within the bond provisions.

Two hundred bond issues were examined to determine whether or not flexibility of powers, provided for the board of education within the issue, had any detrimental effect upon the percentage of popular affirmative vote obtained for the issue.² The bond issues were separated into the four following classifications: (1) provided little or no flexibility, and specifically detailed the latitude of operation for the board of education; (2) provided latitude only for the purchasing of additional sites; (3) provided flexibility only for the erection of buildings; (4) provided flexibility both in the acquiring of sites and the erection of buildings. The percentage of affirmative vote in relation to total number of votes cast was then computed for each bond issue and compiled on the following page:

² Percentage of affirmative vote was not available for three of the issues.

Classification	Number of Issues	Average Percentage Affirmative	Median
1	143	77.0%	78%
2	22	73.8%	73%
3	18	76.4%	73%
4	14	81.0%	73%

The issues examined were those issues that had been successfully passed. It was not feasible in this study to determine the percentage factor of unsuccessful issues, because of the multitude of causes and effects that affect the passing of an issue. These causes and effects would require a separate study in each community in order to isolate any one reason or series of reasons for defeat of the issue. It is, however, clearly indicated in the percentage of affirmative votes cast for each of the four classifications, that the provision of a broadened latitude for the board of education within a bond issue does not result in any substantial difference in the percentage of the vote in favor of the issue.

It would appear then that it would behoove every board of education to provide some degree of flexibility within the bond issue that would allow the board of education to function in the most expedient manner during the life of the issue.

The effect of percentage of affirmative vote obtained on the

number of bond bids received. Dr. Eugene Johnson made the following statement about an affirmative vote of 576 to eighty-four, approving a \$,765,000 bond issue in the Bloomfield Hills School District:³

We hope that this vote (576 to eighty-four) will mean a smaller percentage of interest on our bonds. Usually more bonding companies bid against each other when such total community support is indicated.

The writer desired to check the validity of this statement. The 197 issues were arranged in chronological order according to percentage of affirmative vote. The issues were checked to find if more bonding companies were interested in submitting a price bid when the percentage of affirmative vote was high, and also if fewer companies were interested when the bond issue was passed by a narrow margin. It was found that there was no specific correlation between affirmative vote and bond buyer interest.⁴

II. MEANS OF MEETING THE DEBT RETIREMENT PROVISIONS

Millage levy. Three of the 200 issues guaranteed no minimum millage or dollar tax levy for the retirement of their bonds. Three issues were unlimited-tax bonds, hence it was not necessary

3 Superintendent, Bloomfield Hills School District, 1955-195_.

4 Table XVIII, Appendix.

to specify a millage or dollar levy. Five provided for a maximum millage until such time as the reserve was established. Then the required minimum levy became an amount sufficient to meet the principal and interest due in that fiscal year. Eleven issues provided for a minimum millage levy until a reserve was established. One hundred nineteen provided for a tax spread of a minimum number of dollars, while fifty-nine provided for a minimum millage or a minimum dollar tax spread, whichever is the lesser.⁵

It should again be pointed out that if boards of education are lax in checking the exact provisions of the bond resolutions before the bond sale, they may find themselves saddled with an issue that is not in the best interest of the school district. The general policy is to employ legal counsel or other qualified advisors to provide the wording of the issue, prior to its presentation for public approval and subsequent sale. The school board and the administration often assume that everything is correct, or they do not fully understand the provisions of the issue and pass resolutions later submitted to the voter for approval. If the advice they received was correct, and if the bond issue provided sufficient levy flexibility clauses, probably no crisis can occur that would seriously handicap either their

5 Table XVII, Appendix.

payment program or any future building programs. However, if the advice was in some varying degree faulty, the board may find itself seriously handicapped as well as severely embarrassed.

Taxable years in excess of the life of the issue. The examination of the issues involved revealed that all but thirteen provided for a tax levy that extended beyond the date of maturity of the last bond.⁶ A common practice (ninety-six issues) is to extend the possible tax collection time two years beyond the life of the bond issue. One district provided for a ten year cushion, while the balance varied from three to seven years.

No specific interest rate variation can be attached to the number of years of cushion that is provided in the issue. However, it is generally agreed that the more protection that is afforded the bond holder by the provision of a suitable cushion, the more marketable the bond.

Amount of certificates. Bonding companies have advised the writer that the sale of bonds is generally most acceptable when the bonds are in denominations of one thousand dollars and in blocks of five. A check of two hundred issues revealed that 188 were in one thousand dollar denominations, seven were in combinations of

⁶ Table XVI, Appendix.

one thousand and of five hundred dollar bonds, four were issued in five hundred dollar certificates, and one was of a five thousand dollar denomination.

The apparent trend is for boards of education to follow the practice of issuing their certificates in denominations of one thousand dollars. It should also be noted that although the bonding companies do prefer certificates in amounts of one thousand dollars, there appeared to be no noticeably higher rate of interest on those issues that specified certificates in greater or lesser amounts.

Callable features in bond issues. Most school districts provide bonds within the issues that are callable before the date of maturity. For example, a bond issued in 1954 and maturing in 1974, may be called on any interest date within that period, according to the legal provisions provided within the issue; or it may be allowed to be outstanding until the date of maturity. Such a provision provides more flexibility for the board of education in that the board may decide (1) to buy up the bond on the first callable date, (2) to buy on any other callable date prior to the date of maturity, or (3) to retire the bond debt at the date of maturity. This legal provision in the bond issue provides a means for the board of education to determine, according to its best judgment,

which is the best plan to follow in light of the tax program, the amount of monies available for debt retirement, and the current interest yields.

However, such a variable program is not all to the advantage of the board of education. The fact that the board has a choice in such a debt retirement program adds to the bond buyer risk. That is, the bond holder can not, under such a program, be assured that he will or will not receive his payment for the bond prior to the date of maturity. Therefore, the buyer could, under certain conditions, require a higher interest rate than if such a condition did not exist. The condition is then established that if a bond issue provides for callable bonds, and the bonds are not called prior to date of maturity, the interest cost on the total issue might be greater than if the callable feature were not included. Conversely, if the bonds were called before the maturity date, the total interest cost for the issue could be substantially lower than if the callable provision had not been included in the issue.

The exact position of the individual board of education in calling bonds can not be determined here because of such factors as the legal provisions within the issue, the school's debt retirement investment program, and the current interest rates obtained on such investments as related to the interest demanded by the

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bonds in question. It is legally possible, under certain conditions, for the school district actually to make money on outstanding bonds whenever the interest rate received for legally invested debt retirement funds is greater than the net interest charge for the callable bonds. However, these points should be considered: (1) the school is not an investment company; (2) the board of education has definite moral obligations to the school district; (3) no matter how apparently safe the investment, it still is not as safe as retirement of the district's obligation; (4) districts are expected to call bonds when debt retirement funds are available in accordance with the provisions of the bond sales agreement, and refusal of the board to call such bonds may result in unfavorable debt retirement records, causing subsequent issues to demand higher rates of interest.

It has been revealed in this chapter that there is a considerable variation in the provisions that are incorporated in the individual issues. Often these provisions are inserted by the bonding attorney with little regard by the board of education as to the limitations imposed or to the resulting consequences. Some boards of education, no doubt, do make a concerted study of the provisions involved, but from a study of the issues it is evidenced that far too many do not. Whether or not school boards are

cognizant of the possibilities of variance within the issue, the fact remains that these possibilities do exist. The effect of these provisions has been revealed in part. In order to understand the full impact, it is expedient that they be studied in their relationship to the net interest costs.

CHAPTER VI

NET INTEREST COST ON BONDS

I. MARKETING BONDS

Periods for marketing bonds. Little can be done by the local school administration to control the bond market price. However, there are conditions surrounding the sale of each issue that do affect the net cost of the issue within the limits of the existing bond market. An analysis of bond yields, month by month, from January, 1936, to December, 1955, reveals that some months provide lower rates of interest than do others.¹ The twenty year monthly bond yield average was 2.27%. The months providing the lowest average yield were August, November, and December, each with an average yield of 2.24%. April, June, and October appear to be on the average the poorest months in which to market bonds. The average interest charge over the twenty year period for bonds marketed in these three months was 2.29%.

One can not state positively that certain months will always

¹ Table V, Appendix.

provide the best interest rates. For example, December rated one of the lowest average interest rates, and was actually the lowest month seven times within the calendar year; but it was also the highest calendar month four times within the twenty year span. April, during the same period, had the highest twenty year average rate, but was actually the lowest calendar month three times in that period.² One can, however, generalize that bonds offered for sale in August, November, and December will generally obtain more favorable rates than those sold in April, June, and October. The one thing that apparently pushes bond interest rates up in the spring months is the increased number of issues offered on the market at that time. Therefore, it behooves every school board to be cognizant of the number of issues that may be offered at any one time, and if possible, to offer their bonds for sale at an off peak period.

Acceptance of bids. One of the important decisions that boards of education must make is that of deciding which company provides the lowest bid. Provisions are generally made within the notice of sale of bonds that the average net interest bid shall be computed according to a specific schedule. The bid may be computed

2 Table VI, Appendix.

on the understanding that the callable bonds go to maturity. Or the bid may be computed on the basis that the callable bonds would be called on the earliest call date.

The fact that most of the bonds issued today are unlimited rather than limited, and the subsequent effect of having no reserve established, somewhat limits the ability of early calling of bonds. The results are that the possibility of early calling is reduced, and bonding companies usually assume that fewer bonds will be called prior to maturity. However, bond issues will probably continue to provide for callable bonds sufficient in number to necessitate careful scrutiny of the bid prices submitted.

Generally, the legal counsel or advisor provides the number of callable bonds and the schedule for the calling of bonds as close as possible to the foreseeable paying abilities of the district. However, as has been previously pointed out, no matter how careful the economic projection at the time of sale, economic conditions within a district may vary considerably from the forecast.

Table XIX reveals that one bid differs from the other by only \$278.00 when the bonds are redeemed at maturity. However, the difference in the two bids increases to over three thousand dollars if the callable bonds are redeemed at the earliest call date.

TABLE XIX
NET INTEREST COST VARIES WITH CALL SCHEDULE
COMPARISON OF TWO BIDS*

	Bonds redeemed at maturity		Bonds redeemed at earliest call date	
	Company A	Company B	Company A	Company B
Amount of bonds	\$375,000.00	\$375,000.00	\$375,000.00	\$375,000.00
Total principal and interest	625,362.50	625,124.75	561,562.50	558,618.75
Premium	86.50	147.75	86.50	147.75
Net cost	625,276.00	624,998.00	561,476.00	558,471.00
Net interest cost	250,276.00	249,998.00	186,476.00	183,471.00
Premium			3,000.00	3,000.00
Total			189,476.00	186,471.00
Difference in bid		\$278.00		\$3,005.00

* Bids received by the Clarkston Community Schools, December 3, 1956.

It is revealed in Table XIX that total net interest costs vary with the call schedule. A condition could conceivably exist, then, in which one bid would be low if the bonds are retired at maturity, and a different bid could be low if the callable bonds were redeemed prior to maturity. The board of education should weigh the two bids in the light of its potential bond retiring ability, and determine which bid would probably be the lower. Obviously, the forecast could be in error, but a reasonable forecast should, on the average, provide a more sound program than no forecast at all.

One of the most important decisions that a board must make is the acceptance of one bid or the rejection of all bids submitted. The board should have time to examine and weigh carefully the provisions previously mentioned. Unfortunately, under present conditions, bids submitted are firm only at the time of submitting. The bond sale notices do not provide any clause for a delayed acceptance of a submitted bid. This places the board of education in the position that it must accept the low bid, or it must reject all bids. Such a rejection implies, however, the possibility of negotiating with the low bidder at a later time. This procedure involves the risk that the bid may be withdrawn before the time of negotiation.

It would be a much better situation if a provision could be

inserted in the notice of sale that the bids submitted be firm for a period of at least twenty-four hours. There are several reasons for such a stipulation: (1) If an error occurred in the bid, the time span would allow the necessary checking, et cetera, to determine whether or not it was merely typographical. (2) Granted that the bond market fluctuates, a period of only twenty-four hours would not noticeably jeopardize the bond bidder, because the market might move in either direction. (3) It would provide opportunity to obtain legal counsel, on any point not entirely clear, before the final acceptance of a bid.

II. NET INTEREST COST ON BONDS

Factor analysis of bond issues to determine the relationship of the factors to the net interest cost. In order to determine the factors other than marketing that affect the net interest cost of bond issues, two hundred bond issues, sold from July 1, 1954, to July 20, 1955, were separated into four categories according to the amount of the issue.³

The amount of the issues was studied in relation to the net interest cost obtained for the issue, and it was determined that there

3 Tables VII through X, Appendix.

might be such a relationship.

The net interest cost obtained for each issue was then studied in relation to the equalized valuation of the district that marketed the issue. While it was evident that the districts having a higher valuation generally had more favorable net interest costs, it was also evident that valuation alone did not determine the rate of interest.

The issues were then arranged in order of the ratio of debt to valuation. It was found that although many variations appeared, there was a definite existing correlation between the amount of the net interest cost of the bond issue and the percentage ratio of debt to valuation of the school district. Those issues that had a debt to valuation percentage ratio of more than 10 per cent, and those issues that had a debt ratio of less than 5 per cent, were separated into two groups for further study. Group one consisted of forty-eight issues that had a debt ratio of more than 10 per cent.⁴ The issues varied in amounts from \$21,000 to \$1,500,000. The ratio of total debt to total valuation, including the new issue, ranged from 10.06 per cent to 14.83 per cent. In group two there were thirty-six issues that had a debt to valuation

4 Table XI Appendix.

ratio of less than 5 per cent.⁵ The ratio of debt to valuation in this group ranged from 1.34 per cent to 4.97 per cent. The amounts of the issues ranged from \$24,000 to \$2,100,000.

The issues in group one were then arranged chronologically according to dates of sale, and compared to the national average net interest costs of municipal bond sales for the same periods.⁶

Interest rate comparison of selected issues to the national average. It was found that forty of the issues in group one demanded a higher net interest cost than the national average, and that only eight Michigan issues sold for a lower rate of interest than the national average at the time of sale. The same procedure was followed with group two.⁷ It was found that of the thirty-six issues, twenty-three demanded an average net interest cost equal to or less than the national average of municipal bond sales at time of sale, and thirteen issues required an average net interest cost than the national average.

It is not the purpose here to determine why these issues were above or below the national average. Rather, the national

5 Table XII, Appendix.

6 Table XIII, Appendix.

7 Table XIV, Appendix.

average was utilized solely for the means of establishing that those issues that had a debt ratio of less than 5 per cent, had a greater number of issues demanding less than the national average interest rates than did those issues with a debt ratio of 10 per cent or more.

It is recognized that some hazard exists in this particular procedure, as Michigan interest rates may not always parallel the national average. However, it was impractical to use Michigan averages because the issues studied determine the Michigan average. Further, it was believed that the national average did provide a reasonable scale for comparative purposes. It is worthy to note that the Michigan school bond average interest rate was generally above the national municipal average bond interest rate.

Relationship of the amount of the issue to the net interest cost of the issue. Thirty-six issues, with a debt ratio of 5 per cent or less and bearing an interest rate variation of from 1 per cent to 3.112 per cent interest, and forty-eight issues with a debt ratio of 10 per cent or more and an interest rate variation from 2.02 per cent to 3.5 per cent, were examined as to relationship of the amount of the issue to the average net interest cost. The average amount of the issues in group one was \$324,000 and in group two, \$289,000. The slight difference in the average amount of the issues

would tend to indicate slight relationship between the amount of the issue and the net interest cost. If any inference could be drawn, it would be that larger issues demand more favorable interest rates.

The issues of fifty thousand dollars or less were then selected from both groups, and the average interest rate was computed. There were twenty-one such issues, and the net average interest rate was computed to be 2.654 per cent. The issues were then selected from both groups that were five hundred thousand dollars or more. There were seventeen such issues, and the average net interest cost of these issues was 2.206 per cent. This analysis would substantiate the fact that larger bond issues received more favorable net interest rates.

A third means of checking the relationship was to separate the eighty-four issues into two groups. Group one consisted of the twenty issues demanding the lowest interest rates, and group two consisted of the twenty issues demanding the highest interest rates, as shown on Table XX. It was found that group one contained only five issues of less than one hundred thousand dollars, and ten issues of more than two hundred thousand dollars. Group two contained fourteen issues less than one hundred thousand dollars, and only four issues of two hundred thousand dollars or more.

The exact effect of the amount of the issue upon the net

TABLE XX
COMPARISON AVERAGE NET INTEREST COST
TO AMOUNT OF ISSUE

No.	Group one		Group two	
	Average net interest cost	Amount of issue	Average net interest cost	Amount of issue
1	1.186	\$1,225,000	3.500	\$ 180,000
2	1.493	350,000	3.228	61,000
3	1.514	800,000	3.195	40,000
4	1.597	125,000	3.112	2,000,000
5	1.612	2,100,000	3.110	45,000
6	1.650	40,000	3.094	21,000
7	1.689	170,000	3.090	21,000
8	1.729	60,000	3.065	26,000
9	1.743	50,000	3.013	32,000
10	1.749	500,000	2.997	350,000
11	2.020	750,000	2.970	50,000
12	2.065	525,000	2.968	75,000
13	2.083	315,000	2.941	27,000
14	2.093	40,000	2.930	200,000
15	2.104	40,000	2.918	50,000
16	2.110	24,000	2.919	37,000
17	2.112	310,000	2.910	45,000
18	2.138	200,000	2.910	65,000
19	2.150	600,000	2.863	150,000
20	2.183	100,000	2.847	395,000

interest cost has not been established, nor has a point of diminishing return been located. Rather, it has been the purpose here to establish whether or not there is any relationship between the amount of the issue and the average net interest rate obtained for the issue. There are many variations in the issues studied, but each of the three methods revealed in varying degrees that there is an existing relationship, and that those issues receiving the lower interest rates tend to be the larger issues.

Relationship of the number of bids received to the net interest cost. The same eighty-four bond issues were used to determine the effect, if any, of the number of bids received at a bond sale upon the net interest cost of the issue. The issues again were separated into two groups, Table XXI. Group one was made up of the twenty lowest consecutive interest bearing issues, and group two consisted of the twenty highest consecutive interest bearing issues. The average number of bids received per issue in group one was 3.3, and 2.9 per issue in group two indicated that on the average a lower interest bearing bond might have obtained a greater number of bids.

The groups were then reduced to ten issues each by removing the lower ten issues in each category, thereby increasing the differential in interest rates of the two groups. Group one

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TABLE XXI
COMPARISON AVERAGE NET INTEREST COST
TO NUMBER BIDS RECEIVED

Group one				Group two			
Interest cost	Bids received	Parties bidding	Interest cost	Bids received	Parties bidding	Interest cost	Parties bidding
1.186	6	31	3.500	1	1		
1.493	2	4	3.228	2	2		
1.514	2	4	3.195	3	2		
1.597	2	2	3.110	2	2		
1.612	2	2	3.094	4	4		
1.650	1	1	3.090	2	2		
1.689	9	12	3.065	4	4		
1.729	5	5	3.013	3	3		
1.743	5	5	2.997	4	13		
1.749	2	5	2.970	5	5		
2.020	3	9	2.968	6	7		
2.065	2	14	2.941	2	3		
2.083	4	10	2.930	5	9		
2.093	4	4	2.918	3	3		
2.104	2	2	2.910	3	3		
2.110	5	5	2.910	2	2		
2.112	1	2	2.910	1	1		
2.138	4	8	2.863	2	5		
2.150	3	6	2.847	2	4		
2.183	2	2	2.800	1	1		

issues now had an interest rate range of 1.186 to 1.749, and these issues had received an average of 3.6 bids per issue. Group two issues now ranged in net interest rates from 2.970 to 3.500, and these issues had obtained an average of 2.7 bids per issue. It was noted here that as the twenty lowest interest bearing issues were reduced to the ten lowest, that the average number of bids received per issue increased from 3.3 bids to 3.6. Further, that the reduction of the twenty highest interest bearing issues to ten issues, resulted in a similar reduction of the average number of bids received from 2.9 to 2.7 per issue. This correlation appeared to add strength to the observation that a greater number of bids results in a lower net interest rate for the issue.

However, individual issue studies indicated that the number of bids received does not affect the interest. For instance, issues bearing interest rates of 1.650, 2.112, 2.800, 2.910, 3.500, all received just one bid per issue, while issues receiving interest rate bids of 1.689, 2.110, 2.847, 2.930, and 3.228 had nine, five, two, five, and two bids submitted respectively.

A second refuting of the concept that the number of bids affects the interest, was found when the remaining forty-four issues of the original eighty-four were examined and were found to have received an average of 3.8 bids per issue. This group of issues

had a net interest cost range from 2.183 to 2.847, which placed it between the first two groups analyzed, yet it received the highest average number of bids per issue. The interest rate is apparently not determined to any specific degree by the number of bidders. Rather, the potential rate of interest, size of issue, and marketability, appears to determine the number of bidders.

The erroneous assumption that the greater the number of bidders, the lower the resulting interest rate, can not be checked because no one knows what the results might have been in each bond sale if a greater or lesser number of companies had submitted bids. It would appear, however, that if ten bids were submitted, and the lowest bid was from the same company that would have been the bidder if only one bid were submitted, the interest rate would have been the same. It is possible that some companies might be interested in which other companies were bidding before setting up a bid price. However, because no one company can be sure of the number or of the identity of the competing bidders, it would appear that a company bases its bid, not upon the number of potential bids that will be submitted, but upon the marketability of the issue and the expected profit margin.

There is no concrete evidence, but a hypothesis might be drawn that when several interested companies join together and

submit one bid, the interest rate obtained might favor the involved companies more than if smaller groups submitted a greater number of bids. However, this hypothesis would seem to hold true only when a single bid was submitted. It would appear also that consolidation of companies for purposes of submitting a joint bid is the result of the size of the issue and/or the correlated conditions, rather than a specific attempt by the bidders to control the interest rate.

Relationship of debt to valuation ratio on the net interest cost. The issues that had a ratio of debt to valuation of 10 per cent or more were placed in group one⁸ and those issues having a debt to valuation of 5 per cent or less were placed in group two.⁹ Group one consisted of forty-eight issues ranging in a debt to valuation ratio from 10.06 per cent to 14.83 per cent. The average debt ratio of this group was 11.65 per cent and the median, 11.53 per cent. The net interest cost of the issues ranged from 2.020 per cent to 3.500 per cent, with an average rate per issue of 2.696 per cent. Group two consisted of thirty-six issues ranging in a debt to valuation ratio from 1.55 per cent to

8 Table XI, Appendix.

9 Table XII, Appendix.

to 4.97 per cent. The average debt ratio was 3.34 per cent and the median was 3.60 per cent. The average net interest cost per issue was 2.21 per cent. Group one contained eight issues that had bonds bearing interest rates exceeding 3 per cent. Group one contained no issues that demanded less than a 2 per cent net interest, whereas group two contained ten issues in that category.

In order to verify the analysis that the ratio of debt to valuation does have a direct effect upon the net interest cost received for a bond issue, a second analogy was made. The forty-eight issues were arranged according to their relationship to the national net interest rates for municipal bonds, at the date of sale. The issues that exceeded the national average interest rate by one-half of one per cent and had a debt ratio of 10 per cent or more, were placed in group A. Issues with a debt ratio of 10 per cent or more but demanding an interest rate less than national average, were placed in group B. Issues bearing interest rates more than the national average and having a debt ratio of less than 5 per cent, were placed in group C. Finally, those issues of less than 5 per cent debt ratio and bearing interest rates less than the national average by an amount greater than one-half of one per cent, were placed in group D.

The ratio of debt to valuation varied in group A from

10.10 per cent to 14.83 per cent, with an average debt ratio of 11.56 per cent. Group B ranged from 10.11 per cent to 13.52 per cent, with an average of 11.66 per cent. Group C varied in debt to valuation ratio from 1.34 per cent to 4.97 per cent, with an average rating of 3.83 per cent. Group D ranged from 1.48 per cent to 4.15 per cent in debt ratio, with an average debt ratio per issue of 4.15 per cent.

<u>Group</u>	<u>Average Debt Ratio</u>	<u>Average Net Interest Cost</u>
A	11.56%	3.044
B	11.66	2.240
C	3.83	2.683
D	2.54	1.741

Although the average debt ratio was slightly higher in group B than in group A, the lowest debt ratio in each group was similar, and the high in group A exceeded the high in group B by 1.31 per cent. The interest rates in group C exceeded the average rates in group B. However, because the issues in group B had interest rates below those of the national, and group C had interest rates above the national average, the inference might be drawn that factors other than ratio of debt to valuation could have caused this discrepancy. These analyses do establish that there

is an existing relationship between the debt to valuation ratio of a school district and the average net interest costs of the bonds sold by the district, but that it is not the sole factor.

Percentage of callable bonds and the relationship to net interest cost. It is generally accepted that in the process of retiring a debt, the interest payments become progressively reduced as the payment of principal becomes progressively larger. Most school districts provide for this situation not only by having a greater portion of bonds maturing in the later years of the debt retirement program, but also by providing for a specific number of callable bonds.

Callable bonds within an issue can result in at least two manifestations. One, it enables a district to redeem the callable bonds ahead of maturity as specified in the bond resolution, with a resulting decrease in total net interest cost. Two, because of the callable feature, a certain amount of uncertainty or buyer risk is written into the bond issue, and hence the average net interest cost to the district would be correspondingly higher.

The first situation is basic and needs no further study. It is generally accepted that the more rapidly a debt is retired, the smaller the net interest cost. However, the second point implies that a district receives a more favorable net interest cost when

callable bonds are omitted in an issue that it does when callable bonds are included and not redeemed prior to the date of maturity.

It was not feasible in this study to determine the entire effect of the callable bond upon the net interest cost, but it was desirable to determine if there were any correlation between the percentage of bonds that were callable in an issue and the net interest cost. Two hundred issues were examined and the ratio of the amount of the callable bonds to the total amount of the issue was determined in percentage. It was found that only three of the two hundred issues examined, made no provision for callable bonds, while five issues provided for 90 per cent or more of the issue to be callable, the highest of which provided for 97 per cent of the total issue to be called. The median appeared at 74 per cent. That is, 50 per cent of the issues examined had callable features that provided for 74 per cent or more of the issue to be redeemed prior to maturity date.

The average net interest cost was then compared between those issues that had 74 per cent or more of the bonds callable, and those that had less than 74 per cent callable. The average interest rate of issues having 74 per cent or more callable was 2.616681 per cent as compared to 2.467378 per cent for those issues having less than 74 per cent of bonds callable. There

appeared to be a great amount of variation among the individual issues as to the net interest cost in relation to the percentage of callable bonds, indicating that factors other than the percentage of callable bonds were having their effect. Therefore, it was believed advisable to attempt a second analysis.

For the second analysis, the forty-eight issues that had an average debt to valuation ratio of 10 per cent or more, and the thirty-six issues with a debt ratio of 5 per cent or less, were arranged chronologically according to net interest cost. It was found on the average that 59.8 per cent of the bonds were callable in issues having a net interest cost of less than 2.558 per cent. The issues having a net interest cost of more than 2.558 per cent had an average of 70.5 per cent of the bonds callable.

It would be difficult indeed to determine the degree of effect of the percentage of callable bonds, as it is impossible to isolate any one of the factors from its relationship to the other factors involved. However, it has been demonstrated, in the two hundred issues studied, that those issues that have the higher percentage of bonds callable also have on the average the higher net interest cost if the bonds go to maturity before being redeemed. It must also be stated here that, if the bonds are redeemed before maturity, those issues having the highest percentage of callables could

conceivably pay the least amount of financing cost. However, it is not possible to study this aspect because the future retirement history of these bonds is a question.

Length of issue as related to net interest costs. The number of years for which the bonds are issued generally increases the buyer risk. It is difficult to predict the economic conditions a year in advance with any definite degree of assurance. Therefore, it is understandable that the buyer assumes some additional risk in investing monies for a twenty year period, when there is no possibility of appreciation of investment. However, because there is a second factor involved in that the length of the issue is usually proportioned to the district's ability to pay, the buyer is usually more concerned about this risk than the lack of appreciation of invested monies.

The conclusion drawn in the study of eighty-four issues is that those issues having an interest rate of less than 2.558 per cent had an average life of thirteen years, while those issues bearing interest rates in excess of 2.558 per cent, had an average span of seventeen years.

Relation of present debt to net interest cost. In the eighty-four issues studied, seven issues with net interest costs below the median interest rate had no present debt, while twenty-six issues

with net interest costs above the median had no present debt. Twenty-eight issues with interest rates below the median had small debts as compared to six small debt issues with interest rates above the median. Five districts that had debts ranging from medium to large received interest rates below the median, and five other districts in the same debt category received bids above the median interest rate.

It is apparent that the present debt is not important in itself, except as related to the total debt to valuation ratio of the district. However, one might hypothesize that a recent debt accompanied by a good debt retirement record, places the district in a more favorable position to sell its bonds than a district that had no previous debt record from which to judge its paying record and attitude.

Debt history and its relation to net interest cost. The same hypothesis would hold true for debt history as for present outstanding debt. That is, a good debt history might provide a more favorable bond selling position than no history at all. In examination of the eighty-four issues it was found that the debt history of Michigan schools is excellent. Seven had no previous debt record, fifty-nine districts had no records of default or delayed payment of obligations, and eighteen districts had had

minor problems in meeting payments during the bank holidays of 1932.

It was concluded that the debt history does have an effect upon buyer interest, in the same general relationship that any lender has to any borrower. The greater the risk, the greater the demanded interest rate. However, the information gathered in this survey is too limited to draw any exacting conclusions as to the amount of the effect.

Percentage of current tax collections versus net interest cost. The percentage of taxes collected is of major importance to bond purchasers. The Municipal Finance Commission will not approve a sale of municipal bonds if the current tax collection rate is less than 75 per cent. Further, bond dealers demand that school districts account for low tax collection at the time of sale, if the tax collection is below 90 per cent. The eighty-four issues studied revealed that the forty-one issues, having an average net interest cost of less than 2.558 per cent, had an average tax collection rate of 99 per cent. Those issues bearing interest rates in excess of 2.558 per cent, averaged 98 per cent in yearly tax collection. Table XXII reveals that tax collection records of Michigan are rather favorable. In the eighty-four issues studied, only one district had an average tax collection record of less than

TABLE XXII
FIVE YEAR AVERAGE TAX COLLECTIONS

Number of districts	Average tax collections
35	100%
22	99%
9	98%
6	97%
7	96%
5	95 or below

90 per cent, and it had 89 per cent.

Relation of surplus taxable years on net interest cost. The eighty-four issues were again analyzed to find if the number of years that taxes could be levied over and beyond the life of the issue had an effect upon the net interest cost. The median interest rate of the eighty-four issues has previously been established to be 2.558 per cent. It was determined that the average number of surplus taxing years for those issues bearing an interest less than the median, was 2.3 years; while those issues having interest rates higher than the median averaged 2.1 years. Further study of this factor as it pertained to each individual issue would have to be made, because the important factor to the bond buyer is the ability of the district to meet its obligation during the life of the issue. We may conclude that generally the number of surplus taxable years is not too strong a factor in itself, except in particular cases where there might be some doubt as to the school district's paying ability.

Type of district and its relationship to net interest cost.

The type of district is obviously associated closely with the percentage of tax collection. The bond buyer is not interested in the type of district except as it relates to the ability of the district to pay its obligations. If the district has diversified taxable incomes, stable

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industries and populations, certain racial and religious constituents, and sound residential housing, it finds itself in a more favorable position than does a district that has no industry or a declining industry, migrant populations, poor housing, or a population dependent upon a single type of income.

In the eighty-four issues studied, the district types are represented as follows:

Interest rates below 2.558		Interest rates above 2.558	
Number of districts	Predominate type district	Number of districts	Predominate type district
10	Industrial	0	Industrial
16	Residential	18	Residential
2	Resort	0	Resort
11	Farm	22	Farm

It was further noted that in the ten districts having the lowest interest charge on their bond issues, only 10 per cent were predominately farm areas. The ten districts having the highest interest bearing bonds were 70 per cent farm predominated.

Percentage of affirmative vote on issue versus net interest cost. The effect of affirmative vote was determined to have no direct effect upon the net interest cost. The issues having a net interest average of 2.558 or less passed by an average vote of 75

per cent. The issues bearing an interest rate of more than 2.558 in the eighty-four issues studied were passed by an average popular vote of 77 per cent.

The real effect of a high percentage affirmative vote is the moral value to the school administration and the people of the district. Although this study provides no statistics for attitude, it has been generally observed that public sentiments are more unified and more favorable toward schools when there is a larger favorable vote for its bond propositions.

Attorneys employed versus net interest cost. The writer was unable to measure the effect of the different attorneys that prepared the bond issues as related to the net interest cost. However, some general observations were made.

The first observation made was that in the state of Michigan only four firms are recognized by bonding companies for legalized opinions regarding the legality of a bond sale. The eighty-four issues studied specified the following firms for legal opinions, Table XXIII.

The second observation is that when the opinion of only four firms is recognized by bonding companies, any firm specified other than one of the four would result in duplication of legal work. Such a duplication would result in an additional legal cost to the

TABLE XXIII
FIRMS SPECIFIED FOR LEGAL OPINIONS

Legal firm	Number of issues	Percentage
A	58	69.0
B	15	18.0
C	2	2.4
D	0	0
E*	1	2.4
F*	1	1.2
G*	1	1.2
Optional [!]	5	6.0

* Not recognized by bonding companies.

! To be selected by purchaser of bonds.

*

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11.

*

district.

The third observation is that any legal firm utilized by a district in the formulation of the bond program other than one of the recognized firms would result in a duplication of legal work accompanied by some additional costs to the district.

A fourth observation is that when a local district employs legal assistance that is not recognized by bond companies, the district incurs a greater risk of developing a legally unsound issue, greater delay in securing approval, and completing the bond selling process, either of which adds to the cost of marketing the issue.

Relationship of earmarked millage and net interest cost.

The school board resolutions submitted and voted upon at the bond election generally specify that the millage levy be earmarked for the particular issue in question. However, such is not always the case. The eighty-four selected issues had a total of seven resolutions that failed to earmark the tax levy provided in the resolution to the specific issue. The exact effect can not be determined because of limited number of times the condition appeared. However, of the issues studied the three having the highest net interest costs also had tax levies not specifically earmarked to the issues. The fact that the millage is not specifically

designated for a particular purpose does have an effect on the net interest cost because it does contribute to the buyer risk.

Bond and opinion fees versus net interest cost. It is general practice that if a company incurs an additional expense, the expense is added to the cost of the product. Some bond issues provide for certain fees to be paid by the purchaser, and the net interest cost is the usual means of recouping the cost. However, the cost is approximately the same whether it is paid directly to the second party or whether it is amortized in the net interest cost. Because it has probably little if any effect upon the total cost of processing the issue, the purpose here is to merely reveal the procedure followed in the issues studied.

<u>Number of bond issues</u>	<u>Procedure followed</u>
35	School district paid legal opinion and bond cost printing
5	School district paid legal opinion, purchaser paid bond cost printing
44	Purchaser paid legal opinion and bond cost printing

Summary of factors affecting net interest cost. The bond dealer analyzes the bond issue from the standpoint of saleability and profit. Each dealer has access to the level of the market and the quantity of bonds being offered for sale. If bond issues are

plentiful, the buyer will be more careful in screening the quality of the issue. If bonds are not so plentiful, bond dealers are apt to bid for issues that they would not consider if they had a choice. Dealers must have issues to sell if they are to stay in business. Therefore, exacting degrees of effect of certain factors upon the net interest cost can not be determined except by a specific study of the issue and its relationship to the quantity of issues being offered and the market level at the time of sale.

Many factors are taken into consideration when bond dealers are considering the purchase of a new bond issue. The dealers first analyze the issue from a quality standpoint. They determine (1) whether the district has a good attitude toward its creditors, (2) whether it has had a past history of default and, if so, for what reason, (3) whether tax collections are average or better, (4) whether the district is residential, agricultural, industrial, resort, or combinations of the foregoing, and whether the district has had major problems along this line or problems of particular racial or religious groups that affect the valuation or paying potential of the district, and (5) whether the new issue is properly set up so as to protect both the purchaser and the issuing municipality.

These five points establish the framework in which the bond

The above discussion shows that the $\mathcal{H}^1$ -norm of $\mathbf{u}$ is bounded by the $\mathcal{H}^1$ -norm of $\mathbf{f}$. In fact, we have the following estimate.

Lemma 2.1. Let $\mathbf{u}$ be the solution of (1.1) and (1.2). Then, for any $\mathbf{f} \in \mathcal{H}^1(\Omega)$, we have

$$\|\mathbf{u}\|_{\mathcal{H}^1(\Omega)} \leq C \|\mathbf{f}\|_{\mathcal{H}^1(\Omega)},$$

where C is a constant depending only on Ω .

Proof. We first consider the case where $\mathbf{f} \in \mathcal{H}^1_0(\Omega)$. In this case, we can write $\mathbf{u} = \mathbf{u}_0 + \mathbf{u}_1$, where $\mathbf{u}_0$ is the solution of (1.1) and (1.2) with $\mathbf{f} \in \mathcal{H}^1_0(\Omega)$ and $\mathbf{u}_1$ is the solution of (1.1) and (1.2) with $\mathbf{f} \in \mathcal{H}^1(\Omega)$ and $\mathbf{u}_1|_{\partial\Omega} = 0$. By the Poincaré inequality, we have

$$\|\mathbf{u}_0\|_{\mathcal{H}^1(\Omega)} \leq C \|\mathbf{f}\|_{\mathcal{H}^1_0(\Omega)} \leq C \|\mathbf{f}\|_{\mathcal{H}^1(\Omega)},$$

and by the Sobolev inequality, we have

$$\|\mathbf{u}_1\|_{\mathcal{H}^1(\Omega)} \leq C \|\mathbf{f}\|_{\mathcal{H}^1(\Omega)}.$$

Therefore, we have

$$\|\mathbf{u}\|_{\mathcal{H}^1(\Omega)} \leq C \|\mathbf{f}\|_{\mathcal{H}^1(\Omega)}.$$

Next, we consider the case where $\mathbf{f} \in \mathcal{H}^1(\Omega)$ and $\mathbf{f}|_{\partial\Omega} \neq 0$. In this case, we can write $\mathbf{u} = \mathbf{u}_0 + \mathbf{u}_1$, where $\mathbf{u}_0$ is the solution of (1.1) and (1.2) with $\mathbf{f} \in \mathcal{H}^1_0(\Omega)$ and $\mathbf{u}_1$ is the solution of (1.1) and (1.2) with $\mathbf{f} \in \mathcal{H}^1(\Omega)$ and $\mathbf{u}_1|_{\partial\Omega} = \mathbf{f}|_{\partial\Omega}$. By the Poincaré inequality, we have

$$\|\mathbf{u}_0\|_{\mathcal{H}^1(\Omega)} \leq C \|\mathbf{f}\|_{\mathcal{H}^1_0(\Omega)} \leq C \|\mathbf{f}\|_{\mathcal{H}^1(\Omega)},$$

and by the Sobolev inequality, we have

$$\|\mathbf{u}_1\|_{\mathcal{H}^1(\Omega)} \leq C \|\mathbf{f}\|_{\mathcal{H}^1(\Omega)}.$$

Therefore, we have

$$\|\mathbf{u}\|_{\mathcal{H}^1(\Omega)} \leq C \|\mathbf{f}\|_{\mathcal{H}^1(\Omega)}.$$

dealer operates. Within this framework are certain other factors that affect the net interest cost such as amount of issue, legal counsel, ratio of debt to valuation, length of issue, and percentage of callables, while other factors such as number of bidders, percentage of affirmative vote, and amount of certificate, have little or no affect upon the total cost of issuing and retiring a bond loan.

The timing of the bond sale, as well as the analogy of the bids received, likewise can have an effect upon the net interest cost of an issue. The latter makes it important that in the near future some provision be made to provide a reasonable span of time in which the board may accept one of the bids submitted, rather than the present condition of having to accept bids at the time of bid opening or chance the risk of withdrawal of said bids by the bonding companies.

It has been revealed that certain factors do have an effect upon the net interest costs, and that the bond market does fluctuate in relation to certain economic conditions. It has been pointed out previously that the condition of too high a debt to valuation ratio and a high bond market may cause an issue to be unmarketable. Such a condition was rapidly developing in the state of Michigan. The result was that in 1955 certain hurried changes were made in the Constitution in an attempt to alleviate the situation. In order to

understand the affect of these changes in the school bonding program, it was determined that a separate chapter should be added to this study. Therefore, Chapter VII is an interpretation of the manifestations resulting from this enactment.

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CHAPTER VII

CURRENT STATUS OF SCHOOL BONDING

An expedient enactment. On the fourth day of April, 1955, an amendment to the Constitution of the State of Michigan was approved by a popular vote of 455,668 to 382,093. The legislature followed with two enabling acts, and the State of Michigan was legally in the position to loan up to one hundred million dollars to school districts for the purpose of meeting qualified bond obligations, provided the school districts met the requirements as stipulated in the enactments.¹ By June 29, 1956, only three small suburban school districts had found it necessary to borrow from the state loan fund. The aggregate sum of the three loans amounted to only \$46,058.

On this basis, the Citizens' Research Council of Michigan grossly criticized the amendment as being an example of hurried legislation that urged solutions bearing no reasonable semblance to actual facts and needs involved.² Proponents of the amendment

¹ Public Acts of Michigan, 1955, Act No. 10, Section 27, (as implemented by Acts 74-151).

² Citizens' Research Council of Michigan, "Bulletin No. 661," August 13, 1956.

stoutly defended it by reporting that although only three loans had been made to date, the bulk of the \$111,000,000 worth of school construction undertaken since the law took effect could not have been financed under the legislative restrictions that prevailed prior to 1955.³

In order to determine whether the amendment was necessary and to what extent it does meet the needs of the school districts, it is necessary to relate what transpired immediately preceding the adoption of the amendment as well as the subsequent developments.

On January 18, 1955, Joint Resolution D was introduced to the legislature. This resolution was the hurried result of a group study suggested by real estate interests of the metropolitan area, and conducted under the auspices of the State Department of Education. The provisions of the resolution were: (1) that a state loan fund be provided in an amount not to exceed two hundred million dollars; (2) that a school district with a bonded indebtedness of 9 per cent of state equalized valuation, levying at least forty-seven mills and with authorization by electors of the district, could be eligible to participate in the loan; (3) that a state school

3 News article in the Detroit Free Press, July 2, 1956.

construction board be established for the purpose of supervising and directing the state loan program. Objections were raised to Joint Resolution D on the basis that the provisions contained within the resolution would not be acceptable to the legislature, and that its provisions were such that it should not be written into the Constitution.

A counter resolution was then submitted that in essence is the present amendment, except that the proposal, as submitted to the legislature, pledged the full faith and credit of the State of Michigan as collateral to the unlimited-tax qualified bond. Although proposal three contains some excellent principles suggested by Schimmel in 1949, it does not provide an adequate solution for all school districts, nor did it provide for the qualification of all school bonds.⁴ Hurried legislation and short cuts utilized to meet a time schedule contributed to certain discrepancies that have resulted in hardships to some school districts, and in a test case in the Supreme Court of the State of Michigan.

Supreme Court test case. In early March, 1957, Paul

⁴ Louis H. Schimmel, "Michigan School Bonds, Effect of Constitutional Amendment adopted November 2, 1948," (unpublished paper read at Conference of County School Superintendents, Lansing, Michigan, January, 1949.

O. Strawhecker, attorney and financial consultant for the Forrest Hills School District in Kent County, sought a legal opinion from the State of New York on an unlimited-tax bond issue for his client. The opinion was sought because it was believed that a favorable decision by a New York firm would result in a greater amount of interest in the purchasing of Michigan bonds by eastern bonding houses. The New York firm of Wood, King, and Dawson, from whom the opinion was sought, refused to give a favorable opinion until such time as the Michigan Supreme Court ruled favorably on the Thirteen Mill Amendment.

The immediate result of the action taken by Wood, King, and Dawson was that no further sale of unlimited-tax bonds could take place in Michigan pending a Supreme Court decision. Michigan bond attorneys could not give a favorable legal opinion as long as a New York firm questioned the legality of the amendment.

A Supreme Court test case was instigated through the cooperation of the Haslett Board of Education. Haslett had sold an \$850,000 bond issue on April 2, 1957, and although the bonds had been sold, they could not be delivered for lack of a legal opinion. The secretary of the school board refused to sign the school bonds on the basis that the bonds were not legally acceptable, and the remaining members of the board brought suit against him because

1. 在 1990 年，中国的人均 GDP 为 100 美元，而美国的人均 GDP 为 10000 美元。如果假设中国和美国的人均 GDP 都以每年 5% 的速度增长，那么到 2050 年，中国的人均 GDP 将达到多少？美国的人均 GDP 将达到多少？

2. 假设一个国家的 GDP 为 1000 亿美元，人口为 10 亿。如果该国的 GDP 以每年 3% 的速度增长，人口以每年 1% 的速度增长，那么到 2050 年，该国的 GDP 和人口将分别达到多少？

3. 假设一个国家的 GDP 为 1000 亿美元，人口为 10 亿。如果该国的 GDP 以每年 3% 的速度增长，人口以每年 1% 的速度增长，那么到 2050 年，该国的 GDP 和人口将分别达到多少？

4. 假设一个国家的 GDP 为 1000 亿美元，人口为 10 亿。如果该国的 GDP 以每年 3% 的速度增长，人口以每年 1% 的速度增长，那么到 2050 年，该国的 GDP 和人口将分别达到多少？

5. 假设一个国家的 GDP 为 1000 亿美元，人口为 10 亿。如果该国的 GDP 以每年 3% 的速度增长，人口以每年 1% 的速度增长，那么到 2050 年，该国的 GDP 和人口将分别达到多少？

6. 假设一个国家的 GDP 为 1000 亿美元，人口为 10 亿。如果该国的 GDP 以每年 3% 的速度增长，人口以每年 1% 的速度增长，那么到 2050 年，该国的 GDP 和人口将分别达到多少？

7. 假设一个国家的 GDP 为 1000 亿美元，人口为 10 亿。如果该国的 GDP 以每年 3% 的速度增长，人口以每年 1% 的速度增长，那么到 2050 年，该国的 GDP 和人口将分别达到多少？

8. 假设一个国家的 GDP 为 1000 亿美元，人口为 10 亿。如果该国的 GDP 以每年 3% 的速度增长，人口以每年 1% 的速度增长，那么到 2050 年，该国的 GDP 和人口将分别达到多少？

9. 假设一个国家的 GDP 为 1000 亿美元，人口为 10 亿。如果该国的 GDP 以每年 3% 的速度增长，人口以每年 1% 的速度增长，那么到 2050 年，该国的 GDP 和人口将分别达到多少？

10. 假设一个国家的 GDP 为 1000 亿美元，人口为 10 亿。如果该国的 GDP 以每年 3% 的速度增长，人口以每年 1% 的速度增长，那么到 2050 年，该国的 GDP 和人口将分别达到多少？

of his refusal to sign the bonds.⁴ The three questions raised by the defendand regarding the legality of the amendment are as follows:

1. The form that was set forth in the joint resolution passed by the Michigan Legislature, authorizing the submission of the amendment to the electors, was changed by the Secretary of State when the question was prepared for submission to the electors of the State. Wood, King, and Dawson raised the question of whether or not the Secretary of State had the right to make the change in form.

2. Wood, King, and Dawson point out that the Constitutional Amendment covers more than one purpose or subject but was submitted to the electors as a single question on one ballot. The double purpose is (1) the establishment of a \$100,000,000 School Bond Loan Fund and (2) the issuance of bonds payable from unlimited taxes. Wood, King, and Dawson ask whether or not it was necessary to submit these in one or in two separate ballots.

3. The third point concerns the question of whether or not the 1955 Constitutional Amendment altered or abrogated Section 21 of Article X of the Constitution, commonly known as the Fifteen Mill Amendment. If the 1955 Amendment altered the provisions of Section 21, (adopted in 1932), then was it necessary to publish Section 21, Article X, along with Section 27, Article X, as part of the election notice and ballot?

Effect on school bonding. The Supreme Court decision on this case was of extreme importance because, until such a dicision was reached, there existed a question of legality on approximately

4 Graham, et al., Members of Haslett Board of Education, vs Noel Miller, No. 47353.

two hundred million dollars of such unlimited-tax bond issued in the less than two year period since the adoption of the amendment, and the question as to whether any future unlimited-tax bonds could be issued.

Several school districts had sold school building and site unlimited-tax bonds, and were in the process of obtaining a final legal opinion before obtaining the actual funds. The aforementioned legal question stopped all sale of such bonds until a decision was obtained from the Supreme Court.

Several hardship conditions that did or could have developed were: (1) no unlimited-tax bond issues could be marketed from March 5, 1957 to June 14, 1957; (2) twenty-three issues involving \$22,770,000 were sold but could not be delivered;⁵ (3) some school districts were notified by the bidders that the bonding companies might not honor their bid on unlimited issues sold but not delivered, because the district was not able to provide a marketable issue within the specified time; (4) some school construction already underway could be stopped because of the inability of the schools to obtain funds; (5) some districts might have the expense of re-selling bonds as well as experiencing perhaps a higher interest bid

5 Table XXIV, Appendix.

The first part of the paper is devoted to the study of the
 properties of the function $f(x)$ defined by the equation

$$f(x) = \int_0^x \frac{1}{1+t^2} dt$$
 for $x \in \mathbb{R}$. It is shown that $f(x)$ is an odd function and
 that $f(x) \in C^1(\mathbb{R})$. The second part of the paper is devoted
 to the study of the function $g(x)$ defined by the equation

$$g(x) = \int_0^x \frac{1}{1+t^4} dt$$
 for $x \in \mathbb{R}$. It is shown that $g(x)$ is an even function and
 that $g(x) \in C^1(\mathbb{R})$. The third part of the paper is devoted
 to the study of the function $h(x)$ defined by the equation

$$h(x) = \int_0^x \frac{1}{1+t^6} dt$$
 for $x \in \mathbb{R}$. It is shown that $h(x)$ is an odd function and
 that $h(x) \in C^1(\mathbb{R})$. The fourth part of the paper is devoted
 to the study of the function $k(x)$ defined by the equation

$$k(x) = \int_0^x \frac{1}{1+t^8} dt$$
 for $x \in \mathbb{R}$. It is shown that $k(x)$ is an even function and
 that $k(x) \in C^1(\mathbb{R})$. The fifth part of the paper is devoted
 to the study of the function $l(x)$ defined by the equation

$$l(x) = \int_0^x \frac{1}{1+t^{10}} dt$$
 for $x \in \mathbb{R}$. It is shown that $l(x)$ is an odd function and
 that $l(x) \in C^1(\mathbb{R})$. The sixth part of the paper is devoted
 to the study of the function $m(x)$ defined by the equation

$$m(x) = \int_0^x \frac{1}{1+t^{12}} dt$$
 for $x \in \mathbb{R}$. It is shown that $m(x)$ is an even function and
 that $m(x) \in C^1(\mathbb{R})$. The seventh part of the paper is devoted
 to the study of the function $n(x)$ defined by the equation

$$n(x) = \int_0^x \frac{1}{1+t^{14}} dt$$
 for $x \in \mathbb{R}$. It is shown that $n(x)$ is an odd function and
 that $n(x) \in C^1(\mathbb{R})$. The eighth part of the paper is devoted
 to the study of the function $o(x)$ defined by the equation

$$o(x) = \int_0^x \frac{1}{1+t^{16}} dt$$
 for $x \in \mathbb{R}$. It is shown that $o(x)$ is an even function and
 that $o(x) \in C^1(\mathbb{R})$. The ninth part of the paper is devoted
 to the study of the function $p(x)$ defined by the equation

$$p(x) = \int_0^x \frac{1}{1+t^{18}} dt$$
 for $x \in \mathbb{R}$. It is shown that $p(x)$ is an odd function and
 that $p(x) \in C^1(\mathbb{R})$. The tenth part of the paper is devoted
 to the study of the function $q(x)$ defined by the equation

$$q(x) = \int_0^x \frac{1}{1+t^{20}} dt$$
 for $x \in \mathbb{R}$. It is shown that $q(x)$ is an even function and
 that $q(x) \in C^1(\mathbb{R})$.

on the resale; (6) the purchasers of the bonds conceivably could have difficulty collecting the invested money on issues already delivered if the Supreme Court ruled said bonds to be illegal; (7) it might be extremely difficult to get public acceptance in a new public election for a corrected amendment if the present one had proven to be illegal.

Fortunately for all schools concerned, as well as for the bonding companies and their clients, the Supreme Court handed down the following decision on June 13, 1957.

This matter having been heretofore heard upon the petition of plaintiff, and the answer of defendant and the briefs and arguments of counsel for the respective parties hereto, and due consideration thereof having been had by the Court and no sufficient cause being shown to the contrary, It is ordered; that a peremptory writ of mandamus issue out of and under the seal of this Court directing said defendant, said Secretary of the Board of Education of Haslett Public Schools, to forthwith sign the bonds as required by the resolution of the Board of Education of Haslett Public Schools, dated January 10, 1957.⁶

Strengths of the amendment. / The amendment has been a success in that it has enabled some districts to market bond issues that would not have been marketable under tax limitation statutes. Eight hundred fifty-one school districts out of 3,340 districts in Michigan had outstanding debts in the amount of \$371,881,000 as of

6 Graham, et al., op. cit.

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August 1, 1956.⁷ One hundred sixty-one of the 851 districts are encumbered with 85 per cent of the total outstanding debt. Of the 161 districts, only twelve will require more monies for debt service than they can obtain with the thirteen mill debt levy. By January 4, 1957, twenty-five school districts had successfully marketed \$20,641,000 worth of bonds at an average net interest cost of 4.08 per cent. These could not have been marketed under the limitation imposed by the fifteen mill tax limitation laws because the debt ratio of these districts would have exceeded the 15 per cent limitation.⁸ It is stressed by the supporters of the amendment that, to date, \$369,000 is the maximum amount that would be needed from the one hundred million dollar potential loan fund, and that the most ambitious estimate of building needs and subsequent borrowing from the fund, would tax the total resources of the fund less than one-third the amount available.

The amendment not only provides a means of marketing the bonds, but incorporates certain advantages for the holders of these bonds. If the bond is an unlimited-tax issue, the holder is no longer

7 Braun, Bosworth & Co., "Study of Outstanding Bonds and Adequacy of the State Bond Loan Fund," Detroit, pp. 1-19.

8 Table XXV, Appendix.

dependent upon whether or not the voted tax increase is sufficient to carry through to the expiration of the bond issue, with sufficient funds to retire the bonds. If the bond is a qualified bond, the holder enjoys a measure of security that goes beyond the ability of the school district to levy sufficient taxes to pay principal and interest obligations as needed. This measure of security results from the state's obligation to loan monies for purposes of meeting the payments in full, when and if the obligations exceed the tax collections as a result of too low a tax base, or a decline in tax collections or receding property valuations.

There are several advantages that conceivably could be divided between the school and the taxpaying public, but because the interests are mutual, these advantages will be treated under the single grouping of the school districts. Certainly one of the outstanding advantages, at least to some districts, is the fact that they can now borrow money through the sale of bonds, where under the tax limitation statutes they were prohibited from floating any further bonded indebtedness. Other districts, though they could have floated loans, would not have been able to do so for the amounts that they desired.

The possibility for a rapidly growing district to build needed structures on a low tax base is greatly enhanced through the

provision of the extended credit period and the elimination of the limitation on the amounts that could be borrowed. At this writing, at least one district had sold bonds although their debt ratio to the total taxable valuation was in excess of 40 per cent.

Many of these districts are not as seriously indebted as would appear on the surface. As the community tends to stabilize, many of them will enjoy a larger tax base and a corresponding lesser demand for additional new school facilities. Definite advantages are evident here: first, in that the taxpayer supposedly is protected against unusually high tax levies at any one time, and second, over a twenty-five to thirty year period, the facilities tend to be paid for by all the users; whereas, if the debt must be retired in eight to twelve years, the cost is born just by the initial users.

The district no longer has to vote tax limitation increases unless it desires to sell limited-tax bonds. If the district does not choose to float limited bond issues, it is unnecessary to overlevy for the purpose of establishing reserve funds. The elimination of such reserves greatly reduces the necessity for the school to be in the investment business. As has been pointed out earlier in this study, such a condition not only provides additional safety factors for the taxpayers, but also greatly reduces the strain and mental

anguish on the part of the members of the board of education and the school administrators.

An advantage of some consequence is that the district has several alternatives. Not only does the district have a choice in the type of issue it desires to market, but if the bonds are qualified the district has several possibilities for determining the amount of tax that is to be levied.

The district may levy less than thirteen mills in any one year, provided that the amount levied will meet the principal and interest obligations, and provided that the district has no obligation due the state loan fund. If a thirteen mill levy will not meet the principal and interest obligation in any one year, the district may levy in excess of thirteen mills that amount that will meet such obligations; or it may borrow from the state the amount of difference needed. A third choice would be to levy some in excess of the thirteen mills, but not enough to meet the entire obligation, and thereby reduce in part the amount necessary to borrow from the state loan fund.

It is further stressed by proponents of the amendment, that a wider market for sale of Michigan school bonds will develop as out of state companies become aware of the possibilities of sound investments in Michigan school bonds. In the past, many companies

have regarded Michigan bonds as being somewhat of a risk because of the limitations on tax spread under the fifteen mill provisions. Not enough time has elapsed since the adoption of the amendment to determine the extent to which this will be an advantage. However, the recent concern of a New York firm in Michigan unlimited bonds, as evidenced by the Supreme Court case, indicates that there exists an added interest; and, if that be the case, it is conceivable that more favorable net interest costs may result for school districts in the state.

Weaknesses of the amendment. It has been revealed that the amendment has greatly aided the ability of school districts to meet the pressing problem of large capital outlays for building purposes. However, the possibility exists that the amendment did not go far enough in its effort to provide relief to school districts; and that it is just another means of acquiring a temporary solution to a problem without truly facing up to the fact that education is a function of the state, and that the state should provide a greater semblance of equality throughout its multitude of individual districts.

It was related previously that it was necessary for only twelve districts to borrow from the state loan fund, and then only for an estimated amount of \$369,000. Opponents of the amendment

interpret this small sum as being evidence that the amendment did not truly meet the need of hard pressed districts, but provided merely a means for getting further in debt for a longer period of time. Even with the extension of credit, eight of the 161 districts having the largest bonded indebtedness still are in the position of having a debt to valuation ratio in excess of 15 per cent, and one district has a deb ratio of 36.37 per cent. Though they were provided with the means of procuring added facilities, they were saddled with a larger long term debt and with a greater potential risk than any district should carry for the safety and welfare of its inhabitants. All other things being equal, the possibility of industry moving into these Michigan areas and stabilizing the community is reduced because of the debt ratios previously established.

The point in question is that the new amendment still utilizes the tax base of the local district as the sole means of retiring a school bond debt obligation. When the amount of tax collections are subject to the fluctuating state equalization factor, economic conditions, and indirectly to the allocation board whims, it is difficult indeed to justify the property tax as the sole means of income for debt retirement.

Under present conditions, with state revenues for operation

declining and the trend of the allocation boards to usurp a greater portion of the fifteen mill allocation for county functions, it becomes increasingly difficult for schools to operate without levying special millages.⁹ Those districts that must levy a thirteen mill debt tax rate to meet their bonded school indebtedness in part or in full, are also handicapped in finding sufficient revenue for operation. Thus the amendment provides an easier means of financing school debt, but jeopardizes the ability to raise adequate funds for operation. The resulting inequality not only reduces the operation funds in one district versus a more fortunate area, but results in the poorer district paying a third to a half more for classrooms because of added interest costs than does a district that can finance its buildings over a relatively short time.

A weakness of the amendment is that it provides for the issuance of unlimited-tax bonds only until July 1, 1962. If the current anti-borrowing attitude persists among the public, it may be impossible to extend the time limit now established, and some districts may find themselves again in the position of not being able to sell unlimited bonds for purposes of capital outlay. If

⁹ Home Rule Depends on Local Support, (Central Michigan School Administrators Research Association, Vol. 1, No. 4. Mt. Pleasant, 1956), 15pp.

an unforeseeable condition should materialize in which the one hundred million dollar fund is exhausted, some school districts might conceivably have to levy a millage considerably higher than thirteen mills. The assumption is that the amendment provisions will be extended if the need proves justifiable, and that the loan fund could be increased if needed. However, these are only assumptions, and may not come to pass. Therefore, the criticism of this phase of the amendment is justifiable at this time.

A shortcoming that was not sensed until after the amendment was passed resulted from the interpretation of the wording. Several districts had marketed limited-tax bonds, but the bonds were not delivered until after May 4, 1955. The amendment stated that all bonds sold prior to May 4 were automatically qualified, and that all unlimited-tax bonds issued subsequent to that date could be qualified. The opinioning attorneys held that the bonds were not sold until they were actually delivered. Thus a situation developed in which some districts had bonds that they were unable to qualify, no matter what the districts' wishes might have been.

The amendment as originally worded provided for the full faith and credit of the State of Michigan as security for the bond issue. The wording was changed, and the amendment as adopted

provides for the full faith and credit of the school district supplemented by the provision of monies available through state loan. It is not possible to relate at this time the effect of this change upon the net interest rates currently being obtained for school bond issues. It is reasonable to assume, however, that the full faith and credit of the state would have resulted in lower net interest costs, because it is a larger and wealthier unit of government possessing additional means of obtaining needed revenues.

Several conditions of the amendment could be potential causes for embarrassing or hardship situations. A well-meaning district, through error of judgment or through extenuating circumstances, may levy a millage less than thirteen mills. Tax collections from the levy might not be sufficient to cover the total principal and interest obligations. In accordance with the provisions of the qualifying clause, the district would have no means of securing a loan and would have to temporarily default in its payments or utilize such non-earmarked funds as it might be fortunate enough to possess. Further, if the district has already borrowed from the loan fund, the state may withhold primary and state aid monies when the full thirteen mills are not levied until such time as the loan is repaid. A third way in which the operation of a school can be affected through the qualifying program, is

that the state levies a charge against the district for the qualification of bonds. No maximum fee is established, but a minimum fee of one hundred dollars is provided. Although any fee charged against the school district results in the lessening of revenue for some other purpose, it is reasonable to assume that this fee will not become so exorbitant that it will become too serious a matter. The seriousness, though, results from the fact that this amendment provides a wedge through which the state may legally charge school districts for services rendered. The inherent danger, then, is not so much the amount of the fee, but the fact that a pattern may have been established that could grow ultimately to a point where the state "back charges" the school for all the services rendered. The State Department then becomes an entity in itself rather than merely an agent of the schools in the state.

Another phase of the amendment that may have serious implications is that the bonds to be qualified must provide revenues for certain types of school facilities. Facilities not approved by the state can still be erected, but that portion of the total bond issue used for such expenditures must be deducted from the amount qualified. On the surface this could be good, in that it allows a school district to provide what it wishes if it is willing to pay for it in excess of the thirteen mill qualified limitations. The fallacy is

that some districts, by virtue of their location, can provide special facilities on a reasonable basis, while at the same time a relatively poor district is informed that such facilities for its students is out of the question unless an additional levy over and above the thirteen mills is raised. However, had such a district provided special facilities with limited-tax bonds even to the detriment of sound planning prior to May 4, 1955, the facilities could have been paid for within the provisions of the thirteen mill levy.

Probably one of the strongest objections to this situation is not the additional levy necessary, but it is the fact that for the first time in the history of the state, approval must be received from the state for the erection of certain facilities under specified conditions. This is interpreted by many as again being an opening wedge that leads in the direction of state control of education. Such fear at this time may be grossly exaggerated. However, control of facilities no matter how slight can only be interpreted as a step in that direction.

Analysis of bond issues, 1955-56. A condition developed during this period that resulted in considerable financial loss as well as time loss to school districts. It was related more to the rising bond market than to any phase of the amendment, but is nevertheless pertinent to the study of the issues marketed in this

period. This condition developed through the persistent attempts of bonding attorneys to estimate the bond market too closely. The Constitution provides that the maximum interest rate for a bond issue shall not exceed 6 per cent. However, bond attorneys usually provide in the resolution to be adopted by the board of education prior to the sale of bonds, an interest rate somewhat less than the maximum, and as close to the prevailing rate as possible. The maximum rate as established in the resolution has no bearing upon the interest rate actually received for the issue, but merely signifies that the district will not pay a rate greater than the amount stipulated. The reluctance of the attorneys to provide for a 6 per cent maximum resulted in many issues being offered for sale with maximum acceptable rates lower than the market price at the actual time of sale. The inevitable result of such a procedure was that the issue offered for sale received no bids. The maximum interest rate was then increased in the resolution, and the issue was re-offered for sale. By this time, however, the bond market in some cases had increased to the extent that the revised maximum was again too low.

The result of this procedure was that many bond issues were rebid at least once, and some as often as three times. The board of education not only has the additional cost of readvertising,

but experiences considerable delay in marketing the bonds. Some districts experienced a financial loss in that in a rising market the greater the delay in selling the bonds, the higher the interest rates obtained for the sale of the issue. This point is stressed because no value apparently is derived from setting a maximum acceptable millage of a lesser amount than that established by the Constitution, and a great amount of loss can develop from establishing the acceptable rate too low.

Although the amendment has been in effect less than two years, it is important that the issues marketed during this period be examined in the light of what it has or has not accomplished. The analysis began with January, 1955, even though only one unlimited bond was marketed in the first six months of that year. Though the amendment was effective in early May, most bond issues had progressed sufficiently that the local districts did not deem it to their advantage to revise the issue. Consequently, unlimited issues did not appear in any great number until after July 1, 1955, and the number of unlimited-tax issues did not exceed limited-tax issues until the semi-annual period beginning January, 1956.

Many supporters of the unlimited-tax bond amendment and its qualification clauses, were of the opinion that its adoption would

result in no district paying more than 2 per cent interest on the bonded school debt. It was also anticipated that debts already in existence could be refunded at a lower rate of interest. An examination of bonds sold in a two year period indicates that the reverse was true.¹⁰ Average interest rates have continued to rise with occasional spasmodic downward trends.¹¹ It is significant to note, though it is too early to tell the complete story, that the evidence available at this time indicates that unlimited qualified bonds on the average demanded higher interest rates than did unlimited issues, and unlimited-tax bonds demanded higher rates than did limited issues. Further, that Michigan school bonds demanded still higher average net interest rates than the national municipal bond average.

In the six month period from January to July, 1955, there were ninety issues sold totaling \$30,666,000, and varying in amounts from twenty thousand dollars to \$1,250,000. The median interest rate for these bonds was 2.5111 per cent, and they ranged from a low of 1.4932 per cent to a high of 3.934 per cent.

One hundred seventeen issues in the amount of \$55,295,000

10 Table XXVI, Appendix.

11 Figure 5, Appendix.

were sold from July, 1955, to January, 1956. Sixty-two issues were limited-tax, nineteen unlimited, and thirty-six were of the qualified-unlimited-tax variety. The issues varied in amounts from twenty thousand dollars to \$4,500,000. Median interest rate was 3.058 per cent, while the range was from a low of 2.2649 per cent to a high of 4.04 per cent.

Average net interest cost continued to rise in the period of January to July, 1956. The low for one hundred eight issues sold in the amount of \$76,931,000 was 2.2422 per cent, and the high was 4.1385 per cent, while the median was established at 3.3516 per cent. There were forty-three limited-tax issues, eight unlimited, and fifty-seven qualified unlimited-tax issues, varying in amounts from twenty thousand dollars to \$4,500,000, sold during this period.

In the six month period ending December 31, 1956, there were ninety-two issues marketed in the amount of \$72,775,000. Forty-three were limited-tax issues, while only seven of the seventy unlimited-tax issues were unqualified. Although some rather sizeable and excellent marketable issues were offered, the largest being fourteen million dollars, the interest rates continued to increase. The lowest average net interest rate was 2.6876 per cent, and the new high was found to be 5 per cent,

while the median for this period was established at 4.03 per cent.

During the entire four periods, 216 limited issues, thirty-five unlimited-unqualified, and 156 unlimited-qualified tax issues were marketed. The percentage of each type of bond exceeding the median interest rate for that period is as follows:

Period	U. T. Q.	U. T.	L. T.	Median interest rate
_____	_____	_____	_____	_____
1/1/55 to 7/1/55		100.0%	49.4%	2.5111
7/1/55 to 1/1/56	94.4	63.1	33.8	3.0580
1/1/56 to 7/1/56	70.2	50.0	9.5	3.3516
7/1/56 to 1/1/57	71.4	42.8	2.3	4.0300

It is recognized that many of the districts selling unlimited bonds had debt to valuation ratios that would have prohibited the sale of limited-tax bonds. Also accepted is the fact that some unlimited-tax issues sold during the past two years could not have been marketed had the bonds not been qualified. Qualified issues received higher net interest rates than non-qualified because of such reasons as debt to valuation ratios in the local district, rather than because the state had agreed to loan sufficient monies to meet the principal and interest obligations. Obviously, the greater the possibility of the need for such loans, the greater the need for districts to qualify their unlimited-tax issues.

Limited-tax bond issues, as pointed out earlier in this study, generally receive more favorable interest rates than unlimited-tax issues. This two year analysis further substantiates the fact that, in spite of state guaranteed payments of local obligations, the net interest costs for unlimited-tax issues exceeded that of the limited-tax issue by a considerable margin.

It has been stated by some that the interest rates were lower during this period than might otherwise have been, had the amendment not been passed. This of course can not be substantiated either way at this time, because one can only hypothesize such generalizations unless the condition actually came to pass. However, it can be pointed out definitely that the bond market did rise considerably during this period, probably because of governmental controls placed upon banks for purposes of controlling inflation. Whether the resulting market is higher or lower than it would have been if the amendment had not passed, is a point of conjecture. The fact is that the amendment did not result in greatly reduced interest costs as predicated.

The amendment also failed in another respect, in that it did not provide for greater equality among school districts. The district that is the hardest pressed for monies for purposes of building, is still paying the higher interest rates because of such

factors as higher debt to valuation ratios. For example, the actual construction cost of a classroom might be twenty thousand dollars. District A might be in a position to purchase said room on a pay-as-you-go basis, and the room actually will cost twenty thousand dollars. District B is in a financial position such that it can use limited-tax bonds, and the classroom might actually cost twenty-five thousand dollars. District C might have to use unlimited-tax bonds, and the principal and interest cost for the classroom to the district could conceivably be thirty thousand dollars or more.¹²

Interest costs are something that are usually left out of discussions relative to bond issues. Figures quoted represent usually the bonded indebtedness, and neglect to include the interest costs. As has been pointed out earlier, interest costs often become nearly as great as the bonded indebtedness. Thus, the district that is financially pressed is still paying more for the same commodity, in spite of the amendment, than the district that is not so financially encumbered.

The district that is a "hardship district" in terms of providing building facilities is usually one that is also sorely pressed

¹² Table XXVIII, Appendix.

for operation funds. Obviously, if a greater portion of its potential tax levy is spread for loans, a smaller portion must be spread for operation. Thus it is reasonable to assume that those districts that are paying a greater cost for their classrooms, because of added interest charges, have less proportionate potential for providing operation revenues.

Some years ago, the State of Michigan recognized that the local tax base was not sufficient to provide funds for operation. It also recognized that the local tax base did not provide funds on an equitable basis to school districts, and an equalization factor was applied to the state formulae for state aid in the form of deductible millage. The thirteen mill amendment recognizes neither of these points in that it does not provide for any revenues other than local taxes for payment of bonded indebtedness, and it does not provide for an equalization between districts, no matter what may be their relative financial positions.

CHAPTER VIII

CONCLUSIONS AND RECOMMENDATIONS

I. CONCLUSIONS

The study revealed that: (1) Michigan school bond laws have developed as a series of expedient enactments closely allied to temporary economic conditions rather than as a result of adequate research and far-sighted planning; (2) boards of education, too often, fail to provide sufficient latitude within the bond issue for board decision-making subsequent to the acceptance of the bond issue by popular vote; (3) the provision for this latitude within the issue has little or no effect upon the percentage of affirmative votes cast by the public for the bond issue.

It was found that certain factors related to the bond issue have a definite bearing upon the average net interest cost of the bond issue. Those factors are: (1) period of marketing the issue, (2) amount of the issue, (3) ratio of valuation to debt of the district, (4) percentage of callable bonds, (5) longevity of the issue, (6) history of previous debt payments, (7) percentage of current tax collections, (8) number of surplus taxable years beyond the life of the issue, (9) socio-economic characteristics of the district,

and (10) millage specifically earmarked to the issue.

The study revealed that certain other factors had no measurable effect upon the marketing of the bond issue and the resultant net interest cost. It was found, for example, that (1) the number of companies involved in making a single bid had no direct measurable effect upon the interest rate obtained, (2) the number of bids received, at the time of sale, for the purchase of the bonds did not in itself determine the rate of interest obtained, and (3) the percentage of the affirmative popular vote obtained in the passing of the bond issue bore no relationship to the ability of the district to market the bonds, nor to the number of bids received for the purchase of the bonds.

It was further concluded that the so-called thirteen mill amendment provides the school districts with the same ability to get itself into long term debts that it had prior to 1932.

A school district, with the assistance of an expedient constitutional amendment, can now bond itself for a period of thirty years; thus it is able to provide itself at least for a brief time with the necessary new school housing. However, it faces the same dilemma that any indebted individual experiences when his credit is further extended by increasing the length of time that is required to meet the obligation.

The amendment then does not relieve the burden of the heavily taxed and rapidly expanding districts. It enables the district only to get further in debt for a greater period of time.

It was very evident throughout the various phases of the study that the tax levies for building purposes were very inequitable throughout the State of Michigan. Many school districts were able to provide pupil housing with little local tax assessment effort, while other districts were in the position of levying extremely high tax rates for long periods of time. This condition often existed simply because the employees resided in one district while the location of employment was largely located in the other school district.

The very fact that high millage levies for a long period of time are necessary to finance capital outlay in certain areas, in itself adds to the cost to the district because of demanded higher bond interest costs. Such a condition must, to some degree, reflect in the kind of school facilities that are made available in the various districts.

The slightest examination of the data in this study reveals that Michigan is giving only lip service to the concept that education is a function of the state and that every child should have an equal educational opportunity.

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II. RECOMMENDATIONS

1. That the Department of Public Instruction prepare and publish a handbook for the perusal of boards of education. The handbook should contain the procedure for developing and marketing a bond issue, and should describe those factors that have a definite effect upon the net interest cost. Such a handbook would aid school boards to avoid many pitfalls that they have encountered in the past and will encounter in the future.

2. That a study be made at a later date to determine the full impact of the thirteen mill amendment upon the ability of school districts to issue and redeem school bonds.

3. That further study be made to determine the psychological impact of the public toward its schools, resulting from the increased tax burden for school construction.

4. That a study of Michigan tax structure be made for the purpose of determining if a revision of Michigan tax laws would result in school bond interest rates being lowered at least to the average rate that is obtained by the schools of the United States.

5. That a study be made of the possibility of a state revolving fund as a means of providing a more equitable and feasible manner of financing public school buildings. (1) Such a fund would

eliminate the danger of excessive squandering usually evident in outright grants. (2) It would leave the control of the extent of capital outlay within the district. (3) The fund would be replenished and available at a later date rather than depleted as in a grant program. (4) The cost of such a program to the state, even if no interest were charged to the district for the loan, would be far less than if outright grants were made. (5) Every school district would be treated equitably. (6) School districts would not be placed in jeopardy by interest costs that under present conditions often approximate the cost of the buildings.

The first part of the paper is devoted to the study of the
 properties of the function $f(x)$ defined by the equation

$$f(x) = \int_0^x \frac{1}{1+t^2} dt$$
 and to the proof of the following theorem:
 The function $f(x)$ is a continuous function of x and
 its derivative is $f'(x) = \frac{1}{1+x^2}$.
 In the second part of the paper we shall study the
 properties of the function $f(x)$ and its derivative
 and we shall prove the following theorem:
 The function $f(x)$ is a continuous function of x and
 its derivative is $f'(x) = \frac{1}{1+x^2}$.
 The third part of the paper is devoted to the study of the
 properties of the function $f(x)$ and its derivative
 and we shall prove the following theorem:
 The function $f(x)$ is a continuous function of x and
 its derivative is $f'(x) = \frac{1}{1+x^2}$.

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and to the investigation of its behavior as $x \rightarrow \infty$ and $x \rightarrow -\infty$.

2. In the second part, we consider the function $F(x)$ defined by the equation

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and study its properties for $x > 0$ and $x < 0$.

3. The third part of the paper is devoted to the study of the function $G(x)$ defined by the equation

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and to the investigation of its behavior as $x \rightarrow \infty$ and $x \rightarrow -\infty$.

4. In the fourth part, we consider the function $H(x)$ defined by the equation

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and study its properties for $x > 0$ and $x < 0$.

5. The fifth part of the paper is devoted to the study of the function $I(x)$ defined by the equation

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January 20, 1955. 24 pp.

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APPENDIX

TABLE I
ANALYSIS OF THE GROWTH OF BONDED INDEBTEDNESS,
SCHOOL DISTRICTS OF MICHIGAN, 1863 - 1955

School year	Assessed valuation	School bonded debt (gross)	Ratio of debt to valuation
1863	157,863,206*	112,266*	.0007
1870	179,065,450*	961,409*	.0053
1880	374,841,031*	1,293,451*	.0035
1890	849,921,063*	1,661,247*	.0019
1900	946,009,941*	2,038,934*	.0021
1910	1,596,431,914*	5,190,277*	.0032
1915	2,968,236,813	9,953,794	.0033
1920	5,319,702,886	39,234,779	.0073
1925	6,948,318,253	125,575,468	.0181
1927	7,891,195,856	157,610,492	.0199
1928	8,146,581,790	172,097,348	.0211
1929	8,362,913,114	175,937,205	.0210
1930	8,460,234,945	184,315,649	.0217
1931	7,854,628,979	188,465,101	.0239
1932	6,603,821,037	180,900,902	.0273
1933	5,821,072,389	175,569,210	.0301
1934	5,685,263,349	172,374,683	.0303
1935	5,652,288,256	170,912,850	.0302
1936	5,720,274,670	164,326,885	.0287
1937	5,912,306,455	162,142,021	.0274
1938	6,054,858,530	156,145,515	.0257
1939	6,118,663,420	149,414,127	.0244

TABLE I (continued)
ANALYSIS OF THE GROWTH OF BONDED INDEBTEDNESS,
SCHOOL DISTRICTS OF MICHIGAN, 1863 - 1955

School year	Assessed valuation	School bonded debt (gross)	Ratio of debt to valuation
1940	6,027,719,865	141,761,888	.0235
1941	6,266,246,322	146,448,841	.0233
1942	6,623,578,978	131,877,409	.0199
1943	6,826,129,248	120,968,076	.0177
1944	6,956,197,603	110,617,686	.0159
1945	7,187,684,914	103,188,464	.0143
1946	7,558,835,532	96,842,922	.0128
1947	8,476,170,852	91,512,630	.0107
1948	9,139,645,231	88,495,745	.0096
1949	9,729,449,214	92,105,074	.0094
1950	9,940,547,123	135,726,563	.0136
1951	10,704,742,678	165,489,011	.0154
1952	11,531,377,260	196,150,673	.0170
1953	12,094,391,626	231,073,828	.0191
1954	12,782,605,076	291,889,807	.0228
1955	13,481,713,116	336,403,144	.0249

* Jacob Kelder.

1 Michigan State Tax Commission records.

2 Municipal Finance Commission records.

TABLE II
ANALYSIS OF SCHOOL BONDED DEBT, STATE ASSESSED VALUATION
AS RELATED TO POPULATION AND ENROLLMENT

School year	Total state population	School enrollment	Per capita wealth	Per pupil wealth	Per capita debt	Per pupil debt
1863	861,052*	216,144	183.00	730.00	.13	.52
1870	1,184,059*	272,282	151.00	657.00	.81	3.54
1880	1,636,937	362,196	229.00	1,034.00	.79	3.57
1890	2,083,890*	427,032	406.00	1,990.00	.79	3.88
1900	2,420,982*	522,391	391.00	1,810.00	.89	3.93
1910	2,810,173*	562,211	568.00	2,839.00	1.85	9.23
1915	3,210,749	623,087	924.00	4,764.00	3.10	15.97
1920	3,668,412	657,701	1,450.00	8,088.00	10.69	59.65
1925	4,214,641	845,118	1,648.00	8,221.00	29.80	148.70
1927	4,589,400	890,622	1,719.00	8,860.00	34.20	176.96
1928	4,665,102	907,185	1,746.00	8,989.00	36.89	189.70
1929	4,795,393	1,004,212	1,743.00	8,329.00	36.60	175.19
1930	4,842,325	1,036,084	1,747.00	8,165.00	38.06	177.89
1931	4,797,513	1,048,433	1,637.00	7,491.00	39.29	179.92
1932	4,779,661	1,049,505	1,381.00	6,292.00	37.85	172.37
1933	4,780,040	957,904	1,217.00	6,076.00	36.73	182.89
1934	4,797,965	927,383	1,184.00	6,130.00	35.93	185.67
1935	4,837,606	943,867	1,168.00	5,988.00	35.33	181.26
1936	4,888,556	952,292	1,170.00	6,006.00	33.65	172.82
1937	4,967,787	942,328	1,190.00	6,274.00	32.64	172.06
1938	5,055,518	959,827	1,197.00	6,308.00	30.88	162.71
1939	5,156,210	967,852	1,186.00	6,321.00	28.97	154.37

THE FOLLOWING IS A SUMMARY OF THE RESULTS OF THE TESTS CONDUCTED ON THE ABOVE MATERIALS.

TEST RESULTS		TEST RESULTS		TEST RESULTS		TEST RESULTS		TEST RESULTS	
TEST NO.	TEST DESCRIPTION	TEST NO.	TEST DESCRIPTION	TEST NO.	TEST DESCRIPTION	TEST NO.	TEST DESCRIPTION	TEST NO.	TEST DESCRIPTION
1	TEST 1	2	TEST 2	3	TEST 3	4	TEST 4	5	TEST 5
6	TEST 6	7	TEST 7	8	TEST 8	9	TEST 9	10	TEST 10
11	TEST 11	12	TEST 12	13	TEST 13	14	TEST 14	15	TEST 15
16	TEST 16	17	TEST 17	18	TEST 18	19	TEST 19	20	TEST 20
21	TEST 21	22	TEST 22	23	TEST 23	24	TEST 24	25	TEST 25
26	TEST 26	27	TEST 27	28	TEST 28	29	TEST 29	30	TEST 30
31	TEST 31	32	TEST 32	33	TEST 33	34	TEST 34	35	TEST 35
36	TEST 36	37	TEST 37	38	TEST 38	39	TEST 39	40	TEST 40
41	TEST 41	42	TEST 42	43	TEST 43	44	TEST 44	45	TEST 45
46	TEST 46	47	TEST 47	48	TEST 48	49	TEST 49	50	TEST 50
51	TEST 51	52	TEST 52	53	TEST 53	54	TEST 54	55	TEST 55
56	TEST 56	57	TEST 57	58	TEST 58	59	TEST 59	60	TEST 60
61	TEST 61	62	TEST 62	63	TEST 63	64	TEST 64	65	TEST 65
66	TEST 66	67	TEST 67	68	TEST 68	69	TEST 69	70	TEST 70
71	TEST 71	72	TEST 72	73	TEST 73	74	TEST 74	75	TEST 75
76	TEST 76	77	TEST 77	78	TEST 78	79	TEST 79	80	TEST 80
81	TEST 81	82	TEST 82	83	TEST 83	84	TEST 84	85	TEST 85
86	TEST 86	87	TEST 87	88	TEST 88	89	TEST 89	90	TEST 90
91	TEST 91	92	TEST 92	93	TEST 93	94	TEST 94	95	TEST 95
96	TEST 96	97	TEST 97	98	TEST 98	99	TEST 99	100	TEST 100

TABLE II (continued)

ANALYSIS OF SCHOOL BONDED DEBT, STATE ASSESSED VALUATION
AS RELATED TO POPULATION AND ENROLLMENT

School year	Total state population	School enrollment	Per capita wealth	Per pupil wealth	Per capita debt	Per pupil debt
1940	5,256,106	973,737	1,146.00	6,190.00	26.97	145.58
1941	5,404,279	960,216	1,159.00	6,525.00	27.10	152.51
1942	5,530,982	985,643	1,197.00	6,724.00	23.84	143.94
1943	5,423,377	929,260	1,258.00	7,344.00	22.30	130.16
1944	5,429,641	927,041	1,281.00	7,503.00	20.39	119.32
1945	5,483,000	935,285	1,310.00	7,684.00	18.82	110.32
1946	5,867,000	946,627	1,288.00	7,985.00	16.50	102.50
1947	6,064,000	972,378	1,397.00	8,716.00	15.09	95.14
1948	6,175,000	998,045	1,480.00	9,157.00	14.33	88.76
1949	6,270,000	1,036,396	1,551.00	9,387.00	14.65	88.87
1950	6,371,766	1,043,566	1,560.00	9,525.00	21.30	130.05
1951	6,524,000	1,067,434	1,642.00	10,028.00	25.36	155.03
1952	6,708,000	1,107,946	1,719.00	10,407.00	29.24	177.04
1953	6,852,000	1,175,950	1,765.00	10,284.00	33.72	196.50
1954	7,028,000	1,240,730	1,818.00	10,302.00	41.53	235.17
1955	7,236,000	1,296,558	1,863.00	10,398.00	46.47	259.46

* Jacob Kelder Study.

1 U. S. Census reports.

2 Michigan Department of Public Instruction records.

TABLE III

ANALYSIS OF THE TYPE OF BONDED SCHOOL DEBT SINCE 1927

Year	Serial bonds	Sinking fund bonds	Refunding serial bonds	Refunding term bonds	Total bonded gross
1927	98,553,188	59,057,304			157,610,492
1928	113,675,949	58,421,399			172,097,348
1929	117,178,170	58,759,035			175,937,205
1930	127,302,197	57,013,451			184,315,649
1931	132,539,088	55,926,013			188,465,101
1932	128,481,269	52,419,633			180,900,902
1933	124,371,836	51,197,374			175,569,210
1934	122,062,494	50,312,189			172,374,683
1935	66,610,235	24,673,323	53,148,181	26,481,110	170,912,840
1936	60,117,431	23,173,589	53,342,243	37,893,620	174,526,880
1937	53,153,058	16,027,955	42,754,833	50,206,175	162,142,020
1938	47,710,935	13,425,605	47,310,269	47,698,705	156,145,515
1939	45,104,357	11,805,385	45,690,105	46,814,280	149,414,127
1940	40,102,828	10,918,685	41,389,785	49,350,590	147,761,888
1941	36,063,076	10,685,085	29,417,700	70,282,980	146,448,841

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22	1223	1224	1225	1226	1227	1228	1229	1230	1231	1232	1233	1234	1235	1236	1237	1238	1239	1240	1241	1242	1243	1244	1245	1246	1247	1248	1249	1250	1251	1252	1253	1254	1255	1256	1257	1258	1259	1260	1261	1262	1263	1264	1265	1266	1267	1268	1269	1270	1271	1272	1273	1274	1275	1276	1277	1278	1279	1280	1281	1282	1283	1284	1285	1286	1287	1288	1289	1290	1291	1292	1293	1294	1295	1296	1297	1298	1299	1300	1301	1302	1303	1304	1305	1306	1307	1308	1309	1310	1311	1312	1313	1314	1315	1316	1317	1318	1319	1320	1321	1322	1323	1324	1325	1326	1327	1328	1329	1330	1331	1332	1333	1334	1335	1336	1337	1338	1339	1340	1341	1342	1343	1344	1345	1346	1347	1348	1349	1350	1351	1352	1353	1354	1355	1356	1357	1358	1359	1360	1361	1362	1363	1364	1365	1366	1367	1368	1369	1370	1371	1372	1373	1374	1375	1376	1377	1378	1379	1380	1381	1382	1383	1384	1385	1386	1387	1388	1389	1390	1391	1392	1393	1394	1395	1396	1397	1398	1399	1400	1401	1402	1403	1404	1405	1406	1407	1408	1409	1410	1411	1412	1413	1414	1415	1416	1417	1418	1419	1420	1421	1422	1423	1424	1425	1426	1427	1428	1429	1430	1431	1432	1433	1434	1435	1436	1437	1438	1439	1440	1441	1442	1443	1444	1445	1446	1447	1448	1449	1450	1451	1452	1453	1454	1455	1456	1457	1458	1459	1460	1461	1462	1463	1464	1465	1466	1467	1468	1469	1470	1471	1472	1473	1474	1475	1476	1477	1478	1479	1480	1481	1482	1483	1484	1485	1486	1487	1488	1489	1490	1491</
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TABLE III (continued)
ANALYSIS OF THE TYPE OF BONDED SCHOOL DEBT SINCE 1927

Year	Serial bonds	Sinking fund bonds	Refunding serial bonds	Refunding term bonds	Total bonded gross
1942	33,086,053	10,491,650	12,117,561	76,182,145	131,877,409
1943	28,907,801	10,299,900	8,758,230	73,002,145	120,968,076
1944	25,200,899	8,505,050	4,997,000	71,914,587	110,617,686
1945	22,256,877	8,403,050	3,420,000	69,108,337	103,188,464
1946	20,486,140	8,398,000	2,374,700	65,584,082	96,842,922
1947	19,787,160	7,753,000	2,015,000	61,957,370	91,512,630
1948	21,341,155	7,778,000	1,905,000	57,471,490	88,495,745
1949	30,733,890	7,830,000	1,767,000	51,774,184	92,105,074
1950	79,462,478	7,837,000	191,950	48,235,134	135,726,562
1951	113,876,126	7,812,500	77,950	43,722,434	243,361,060
1952	149,025,538	7,190,000	57,400	39,877,234	253,493,272
1953	188,883,292	6,147,500	33,000	36,101,034	264,040,827
1954	255,577,750	4,571,500	21,500	31,719,057	313,368,307
1955	303,784,417	3,355,500	14,500	29,248,727	350,888,644

TABLE IV
NATIONAL AVERAGE YEARLY MUNICIPAL BOND INTEREST YIELDS¹

Year	Interest	Year	Interest	Year	Interest
1915	4.28	1929	4.30	1943	1.93
1916	4.05	1930	4.11	1944	1.65
1917	4.25	1931	4.00	1945	1.55
1918	4.59	1932	4.79	1946	1.49
1919	4.49	1933	5.07	1947	1.89
1920	4.99	1934	4.36	1948	2.37
1921	5.08	1935	3.43	1949	2.15
1922	4.23	1936	2.99	1950	1.93
1923	4.25	1937	2.99	1951	1.94
1924	4.22	1938	3.02	1952	2.18
1925	4.12	1939	2.83	1953	2.73
1926	4.14	1940	2.56	1954	2.39
1927	4.00	1941	2.14	1955	2.47
1928	4.02	1942	2.26	1956*	2.74

¹ Bond Buyer, 131:12, January, 1956

* Trend of Municipal Bond Market, (New York: Chase Manhattan Bank, January, 1957).

TABLE V
20 YEAR AVERAGE MONTHLY BOND YIELD

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1936	3.25	3.11	3.04	3.03	3.12	3.00	2.99	2.95	2.91	2.86	2.85	2.69
1937	2.62	2.74	2.90	3.15	3.09	3.04	3.06	2.94	2.95	3.05	3.15	3.17
1938	3.16	3.07	3.05	3.19	3.08	3.05	3.00	3.01	2.88	2.98	2.90	2.83
1939	2.78	2.76	2.80	2.72	2.78	2.66	2.66	2.67	3.21	3.30	2.93	2.72
1940	2.59	2.63	2.70	2.62	2.59	3.00	2.67	2.53	2.52	2.39	2.32	2.18
1941	2.14	2.29	2.43	2.33	2.26	2.14	2.07	2.07	2.08	2.02	1.90	1.93
1942	2.24	2.36	2.51	2.38	2.33	2.33	2.21	2.15	2.15	2.16	2.13	2.16
1943	2.17	2.12	2.08	2.08	2.01	1.93	1.86	1.83	1.81	1.79	1.69	1.82
1944	1.77	1.70	1.31	1.65	1.69	1.65	1.86	1.59	1.59	1.66	1.64	1.63
1945	1.62	1.53	1.46	1.38	1.35	1.43	1.64	1.46	1.64	1.72	1.56	1.51
1946	1.42	1.31	1.29	1.29	1.37	1.37	1.40	1.51	1.58	1.73	1.66	1.90
1947	1.85	1.83	1.99	1.90	1.89	1.83	1.42	1.81	1.82	1.84	2.03	2.09
1948	2.36	2.44	2.47	2.42	2.33	2.23	2.27	2.33	2.39	2.43	2.45	2.31
1949	2.19	2.17	2.21	2.16	2.10	2.21	2.18	2.13	2.12	2.16	2.13	2.11
1950	2.07	2.05	2.02	2.02	2.02	1.99	2.02	1.85	1.83	1.82	1.75	1.75
1951	1.66	1.58	1.63	1.92	1.94	2.15	2.20	2.06	1.98	2.05	2.04	2.09
1952	2.11	2.07	2.09	2.05	2.03	2.11	2.15	2.28	2.28	2.34	2.38	2.37
1953	2.40	2.48	2.65	2.65	2.75	2.90	3.04	2.92	2.92	2.82	2.64	2.60
1954	2.54	2.46	2.39	2.44	2.49	2.51	2.40	2.26	2.26	2.35	2.33	2.33
1955	2.38	2.43	2.45	2.42	2.39	2.39	2.53	2.58	2.63	2.52	2.45	2.52
Avg.	2.27	2.25	2.27	2.29	2.28	2.29	2.28	2.24	2.28	2.29	2.24	2.24

1 Bond Buyer, 131:12, January, 1956.

[illegible]

TABLE VI
20 YEAR LOW-HIGH BOND INTEREST ANALYSIS BY MONTHS

Month	No. of times low	No. of times 2nd low	Total low	No. of times high	No. of times 2nd high	Total high
Dec.	4	3	7	3	1	4
Nov.	4	3	7	1	3	4
Oct.	0	1	1	1	1	2
Sept.	1	4	5	4	3	4
Aug.	1	3	4	0	2	2
July	2	2	4	3	1	4
June	3	2	5	1	2	3
May	4	1	5	0	2	2
Apr.	1	2	3	1	3	4
Mar.	2	1	3	4	0	4
Feb.	1	2	3	0	2	2
Jan.	2	0	2	4	2	6

TABLE VII

ISSUES OF LESS THAN \$100,000

Date of sale	District	Equalized Valuation	Total net debt	Ratio to valuation	New issue	Net interest cost
5/2/55	Walker Twp. #11	6,036,355	117,000	1.94	60,000	2.222
7/13/55*	Fort Gratiot Unit Sch.	5,669,881	367,800	6.49	35,000	3.000
3/28/55	Cherry Beach #2					
	Cottrellville Twp.	3,736,138	50,000	1.34	50,000	2.715
4/6/55	James Cousens Rur. Agr.	3,551,750	158,000	4.45	65,000	2.398
9/14/54	Hartland	3,299,662	93,000	2.32	60,000	1.729
3/21/55	Wyoming Twp. #2	3,285,975	222,000	6.76	75,000	2.488
5/10/55	Elkton Unit Sch.	2,297,939	67,000	2.69	40,000	2.093
4/13/55	Park Laketown & Filmore 8 Frl.	2,152,416	58,450	2.72	40,000	2.093
1/12/55	Remus Consolidated	2,141,612	74,000	3.17	50,000	1.743
7/13/55	Holland & Park Twp. #7	2,023,335	91,000	4.50	65,000	2.717
10/26/54	Fruitport Twp. #5	2,006,706	40,000	1.99	40,000	1.650
2/14/55	Georgetownship #11	1,819,365	136,710	7.51	60,000	2.250
4/6/55	Henrietta Twp. Agr. #14	1,804,907	145,000	8.03	68,000	2.589
4/18/55	Volinia, Wayne, Penn					
	Decatur Twp. #1 Frl.	1,746,922	50,000	2.86	50,000	2.670
4/28/55	Berona Community Sch.	1,610,844	80,000	4.97	80,000	2.686
7/11/55	Silver Creek Twp. #5	1,545,394	45,000	2.91	45,000	2.910
4/28/55	St. Charles Twp. #1	1,540,812	140,300	9.11	80,000	2.490
4/12/55	Essex, Fulton & Washington #2 Frl.	1,513,485	38,000	2.51	38,000	2.345

* Unlimited-not qualified.

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TABLE VII (Continued)

ISSUES OF LESS THAN \$100,000

Date of sale	District	Equalized valuation	Total net debt	Ratio to valuation	New issue	Net interest cost
12/13/54	Cascade Twp. #4	1,510,851	88,270	5.84	40,000	2.289
7/1/54	Dryden Community Sch.	1,439,407	46,000	3.20	37,000	2.919
2/2/55	Thomas & James Twp. #4	1,392,989	148,000	10.62	75,000	2.968
4/11/55	Tyrone Twp. #4	1,291,227	108,000	8.36	55,000	2.469
4/19/55	Monitor Twp. #2	1,215,666	53,000	4.36	53,000	2.420
1/19/55	Holland Twp. #4	1,200,549	90,000	7.50	90,000	2.477
12/15/54	Maple Grove	1,190,215	70,000	5.88	70,000	2.613
7/14/54	Paris Twp. Sch. Bowen Sta.	1,129,743	116,000	10.27	75,000	2.800
4/27/55	Victory Twp. Mason Cty	1,087,400	65,000	5.98	65,000	2.430
7/27/55	Sodus Twp. #2	1,023,292	80,000	7.82	80,000	2.940
10/28/54	Benton Twp. #8	1,002,863	70,000	6.98	70,000	2.521
7/7/54	Delta Twp. Millet Sch	982,958	80,050	8.14	75,000	3.849
5/18/55	Albee Twp. #3	981,874	75,000	7.64	75,000	2.554
7/21/54	Baldwin Public Sch.	971,080	85,000	8.75	85,000	2.153
7/8/54	Spring Arbor #5	966,028	60,624	6.28	45,000	3.000
12/22/54	Richland Twp. Sch. Ogemaw	947,280	88,700	9.36	20,000	3.000
4/19/55	Gratton Plainfield #1 Frl	941,372	50,000	5.31	50,000	2.652
3/21/55	Alpine & Walker #13	912,026	50,000	5.48	50,000	2.975
5/31/55	Menominee Twp. #8	872,946	55,000	6.30	55,000	2.868
8/26/54	Genoa & Brighton #1	857,866	65,000	7.58	65,000	2.630
7/15/54	Dewitt Twp. Sch Valley Farm	822,203	65,000	7.91	65,000	2.620
6/9/55	Greenbush Twp. #9	796,224	50,000	6.28	50,000	2.303

TABLE VII (Continued)

ISSUES OF LESS THAN \$100,000

Date of sale	District	Equalized valuation	Total net debt	Ratio to valuation	New issue	Interest cost	Net cost
3/1/55	Fruitland & Dalton #1 Frl	784,975	70,000	8.92	70,000		3.934
10/11/54	Park & Port Sheldon #1	769,612	50,000	6.50	50,000		2.390
8/9/54	Coloma, Hogart, Covert #8	741,909	36,000	4.85	36,000		2.644
8/11/54	Spaulding Twp. #1	706,415	91,600	12.97	34,000		2.720
11/23/54	Holton Twp. #5	682,875	60,500	8.86	30,000		2.680
7/15/54	Summit Twp. Sch Dibble	672,777	53,000	7.88	35,000		3.100
5/18/55	Vernon & Shiawassee #1	675,878	62,000	9.42	62,000		2.486
2/2/55	Paris Twp. #4	643,176	38,000	5.91	38,000		2.720
11/8/54	Porter Twp. 1 Frl.	635,865	65,000	10.22	65,000		2.910
8/11/54	Sodus & Benton #13	629,736	37,000	5.88	37,000		2.480
8/16/54	Raisin & Adrain #2	600,300	56,800	9.46	38,000		2.750
8/9/54	Oshtemo Twp. #3	593,752	37,500	6.32	37,500		2.460
2/1/55	Spaulding Twp. #2	553,009	64,112	11.59	40,000		3.195
7/22/54	#3 Norwich Twp.	539,324	40,000	7.42	40,000		2.548
5/17/55	Hastings & Carlton #5	504,928	24,000	4.75	24,000		2.110
11/10/54	Mottville & Constantine	489,913	48,000	9.80	48,000		2.724
10/12/54	Buena Vista #5	480,573	61,000	12.69	61,000		3.228
8/23/54	Deerfield & Marathon #5	477,849	50,000	10.46	50,000		2.970
3/29/55	Kalamazoo & Osthomo #9	463,970	45,000	9.70	45,000		2.573

TABLE VII (Continued)

ISSUES OF LESS THAN \$100,000

Date of sale	District	Equalized valuation	Total net debt	Ratio to valuation	New issue	Net interest cost
5/24/55	Eureka, Oakfield & Orisco #4 Frl.	436,048	25,000	5.73	25,000	2.610
3/31/55	Sparta Twp. #3 White Sch	414,857	40,000	9.64	40,000	2.529
12/3/54	Mt. Morris #11	406,474	50,000	12.81	50,000	2.918
9/13/54	Fairhaven McKinley & Winsor Twp. #2 Frl	399,300	55,000	13.77	55,000	2.500
7/5/55	Owosso Twp. #4	393,754	45,000	11.43	45,000	3.110
6/9/55	Bertrand Twp. #6	345,644	35,000	10.13	35,000	2.658
6/13/55	Berrien Twp. #11	345,353	25,000	7.24	25,000	2.620
7/29/54	Comstock Hoover Sch.	316,114	27,000	8.54	27,000	4.080
11/10/54	Parma & Sheridan #7 Frl	268,535	24,000	8.94	24,000	3.169
11/10/54	Eureka Twp. #3	267,282	27,000	10.10	27,000	2.941
9/21/54	Thomas Twp. #1	267,235	25,000	9.36	25,000	2.500
8/2/54	Grand Haven Twp. #4	236,547	26,000	10.90	26,000	3.065
11/1/54	Lincoln Homer Twp. #1	233,575	21,000	8.99	21,000	2.500
2/16/55	Taymouth Twp. #8	219,418	20,000	9.12	20,000	3.000
4/1/55	Summit Twp. #9 Frl.	215,730	32,000	14.83	32,000	3.012
10/18/54	Milton Twp. #5	202,050	30,000	1.48	30,000	2.648
7/21/54	Ada Twp. #4	177,071	21,000	11.86	21,000	3.094
9/22/54	Swan Creek	153,600	21,000	13.67	21,000	3.090

TABLE VIII

ISSUES OF \$100,000 TO \$499,000

Date of sale	District	Equalized valuation	Total net debt	Ratio to valuation	New issue	Net interest cost
1/12/55	Lakeview	16,247,605	675,000	4.15	350,000	1.493
1/19/55	Three Rivers	13,144,175	514,937	3.92	310,000	2.112
7/18/55	City of Ionia	12,257,936	551,700	4.50	350,000	2.557
7/7/55	Deckerville Comm Sch.	10,970,786	162,500	1.48	100,000	2.265
3/9/55	Onsted	9,958,903	533,200	5.35	475,000	2.650
2/28/55	St. Clair Shores	9,071,180	580,939	6.40	250,000	2.993
9/30/54	Farmington, Redford, Livonia	8,070,501	915,000	11.34	350,000	2.997
1/6/55	Dundee	7,765,260	480,000	6.18	445,000	2.233
8/25/54	Fair Plain	7,745,469	468,575	6.05	325,000	2.0299
7/13/54	Marlette	7,500,000	402,000	5.36	390,000	3.259
6/27/55	Augusta Twp. #1 Frl.	7,185,000	507,000	7.06	300,000	3.259
1/20/55	Harbor Springs	7,019,705	125,000	1.78	125,000	1.597
2/3/55	Pickney Comm Sch.	6,590,093	346,274	5.25	250,000	2.600
5/24/55	Ruron Twp. Sch. Wayne Co.	5,804,353	487,100	8.39	300,000	2.463
7/8/54	Bridgeport	5,794,097	507,430	8.76	225,000	2.486
1/26/55	Lakeland Rur. Agr.	5,700,000	460,000	8.07	460,000	2.417
7/7/55	Pennfield Agr. #1	5,625,476	616,015	10.95	395,000	2.847
4/12/55	Grand Rapids #4	5,577,668	244,971	4.39	105,000	2.340
3/17/55	Deerfield Public Sch.	5,483,200	200,000	5.74	200,000	2.676

TABLE VIII (Continued)

ISSUES OF \$100,000 TO \$499,000

Date of sale	District	Equalized valuation	Total net debt	Ratio to valuation	New issue	Net interest cost
7/11/54	Galesburg Augustan	5,266,831	412,500	7.83	325,000	2.152
12/8/54	Wayland	5,247,507	211,000	4.02	200,000	2.138
8/5/54	Three Oaks	5,225,411	170,000	3.24	170,000	1.689
10/12/54	Gerrish, Higgins Rur. Ag	4,938,729	300,000	6.11	300,000	2.219
1/27/55	Almont #1	4,906,636	384,213	8.10	285,000	2.345
4/7/55	Caseville Twp. #1	4,765,786	215,500	4.52	200,000	2.489
9/2/54	Lake Fenton	4,762,734	508,000	10.67	495,000	2.350
11/16/54	Byron Twp S Kent Cty	4,462,763	375,458	8.41	265,000	2.165
7/13/55	Walker Twp. #7	4,127,633	330,000	7.99	330,000	2.884
5/3/55	Durand Public	4,116,144	304,000	7.39	250,000	2.440
5/12/55	Coronna Public Sch.	3,874,729	325,000	8.39	325,000	2.459
12/1/54	Byron Agr. Sch.	3,786,804	260,000	7.79	260,000	1.937
2/15/55	Novi Twp. #8	3,722,582	228,450	6.14	200,000	2.420
6/15/55	Leslie Public Ingraham & Jackson	3,705,466	345,312	9.32	250,000	2.559
4/28/55	Linden Community	3,619,125	301,000	8.32	295,000	2.270
11/17/54	Kalamazoo Twp. #2	3,595,069	486,000	13.52	247,000	2.200
12/1/54	Schoolcraft	3,548,300	226,500	6.32	150,000	2.182
7/7/54	Muskegon Twp. @ 2 Jolman	3,523,568	351,000	9.96	325,000	3.240
4/18/55	Park & Laketown #4 Fr.	3,486,210	175,000	5.02	175,000	2.144
2/9/55	Wright Twp Sch.	3,486,136	350,000	10.06	350,000	2.558
2/24/55	Saginaw Twp #6	3,307,843	350,000	10.58	350,000	2.748
6/22/55	Tittabawassee Unit	3,276,802	298,372	9.11	250,000	2.621

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TABLE VIII (Continued)

ISSUES OF \$100,000 TO \$499,000

Date of sale	District	Equalized valuation	Total net debt	Ratio to valuation	New issue	Net interest cost
12/16/54	Memphis Comm Agr.	3,232,188	225,000	6.96	225,000	3.313
5/11/55	Lansing & Delta Twp.	3,149,911	170,000	5.40	170,000	2.474
10/14/54	Saginaw #3	3,133,215	384,226	12.26	315,000	2.083
12/22/54	Edmore Rur. Agr.	2,999,396	175,000	5.83	175,000	2.023
10/7/54	Martin Rural Agr	2,989,938	210,000	7.03	210,000	2.116
7/15/54	Cassopolis	2,818,700	314,000	11.14	250,000	2.412
1/7/55	Bentley	2,786,443	238,000	8.51	200,000	2.036
3/23/55	Montrose Twp.	2,693,647	257,445	10.11	130,000	2.395
2/2/55	Old Mission Peninsula	2,668,205	300,000	11.24	300,000	2.594
7/28/54	Whitmore Lake	2,658,012	120,000	4.29	100,000	2.183
7/1/55	Grand Traverse #6	2,625,863	204,775	7.80	190,000	3.129
4/5/55	Allendale Twp #1	2,508,987	170,000	6.78	170,000	2.568
6/23/55	Sumpter Twp.	2,502,066	212,777	8.50	200,000	3.825
12/16/54	North Huron Rur. Agr.	2,484,078	317,000	12.76	300,000	2.394
8/26/54	Hillman Rur. Agr.	2,455,480	290,000	11.81	290,000	2.775
10/13/54	Birch Run Area Sch.	2,444,514	300,000	12.27	300,000	2.266
7/1/54	Centerville	2,318,970	179,000	7.72	175,000	2.153
1/5/55	Mendon	2,279,791	220,000	9.65	220,000	2.221
3/14/55	Holland Twp. #2	2,177,212	125,000	5.74	125,000	2.412
1/20/55	Monitor Twp. #4	2,054,469	168,000	8.18	168,000	2.990
8/16/54	Garfield Twp.	1,977,750	205,250	10.38	200,000	2.930
5/24/55	Park Twp. #3	1,951,604	120,000	6.15	120,000	2.511
4/14/55	Delta Twp. #10	1,940,511	150,000	7.73	150,000	2.458

NAME		ADDRESS		CITY		STATE		ZIP	
1	Mr. J. H. Smith	123 Main St.	Springfield	Ill.	62761	Mr. J. H. Smith	123 Main St.	Springfield	Ill. 62761
2	Mr. W. R. Jones	456 Oak Ave.	Chicago	Ill.	60601	Mr. W. R. Jones	456 Oak Ave.	Chicago	Ill. 60601
3	Mr. T. L. Brown	789 Elm St.	Peoria	Ill.	61601	Mr. T. L. Brown	789 Elm St.	Peoria	Ill. 61601
4	Mr. S. K. Davis	101 Maple Dr.	Rockford	Ill.	61101	Mr. S. K. Davis	101 Maple Dr.	Rockford	Ill. 61101
5	Mr. P. M. Wilson	202 Pine St.	Decatur	Ill.	62521	Mr. P. M. Wilson	202 Pine St.	Decatur	Ill. 62521
6	Mr. Q. N. Taylor	303 Cedar Ave.	Normal	Ill.	62451	Mr. Q. N. Taylor	303 Cedar Ave.	Normal	Ill. 62451
7	Mr. R. O. White	404 Birch St.	Urbana	Ill.	61551	Mr. R. O. White	404 Birch St.	Urbana	Ill. 61551
8	Mr. U. P. Black	505 Walnut Dr.	Macomb	Ill.	61451	Mr. U. P. Black	505 Walnut Dr.	Macomb	Ill. 61451
9	Mr. V. Q. Green	606 Spruce St.	Galena	Ill.	60131	Mr. V. Q. Green	606 Spruce St.	Galena	Ill. 60131
10	Mr. X. R. Hall	707 Ash Ave.	LaSalle	Ill.	61301	Mr. X. R. Hall	707 Ash Ave.	LaSalle	Ill. 61301
11	Mr. Y. S. King	808 Hickory St.	Marion	Ill.	61751	Mr. Y. S. King	808 Hickory St.	Marion	Ill. 61751
12	Mr. Z. T. Lee	909 Dogwood Dr.	Shelburne	Ill.	61361	Mr. Z. T. Lee	909 Dogwood Dr.	Shelburne	Ill. 61361
13	Mr. A. U. Miller	1010 Magnolia St.	Waukegan	Ill.	60081	Mr. A. U. Miller	1010 Magnolia St.	Waukegan	Ill. 60081
14	Mr. B. V. Moore	1111 Poplar Ave.	Winnetka	Ill.	60091	Mr. B. V. Moore	1111 Poplar Ave.	Winnetka	Ill. 60091
15	Mr. C. W. Taylor	1212 Sycamore St.	Wilmette	Ill.	60091	Mr. C. W. Taylor	1212 Sycamore St.	Wilmette	Ill. 60091
16	Mr. D. X. Jackson	1313 Chestnut Dr.	Winthrop Harbor	Ill.	60091	Mr. D. X. Jackson	1313 Chestnut Dr.	Winthrop Harbor	Ill. 60091
17	Mr. E. Y. White	1414 Elm St.	Winnetka	Ill.	60091	Mr. E. Y. White	1414 Elm St.	Winnetka	Ill. 60091
18	Mr. F. Z. Black	1515 Oak Ave.	Winnetka	Ill.	60091	Mr. F. Z. Black	1515 Oak Ave.	Winnetka	Ill. 60091
19	Mr. G. A. Green	1616 Maple St.	Winnetka	Ill.	60091	Mr. G. A. Green	1616 Maple St.	Winnetka	Ill. 60091
20	Mr. H. B. Hall	1717 Pine Dr.	Winnetka	Ill.	60091	Mr. H. B. Hall	1717 Pine Dr.	Winnetka	Ill. 60091
21	Mr. I. C. King	1818 Cedar St.	Winnetka	Ill.	60091	Mr. I. C. King	1818 Cedar St.	Winnetka	Ill. 60091
22	Mr. J. D. Lee	1919 Birch Ave.	Winnetka	Ill.	60091	Mr. J. D. Lee	1919 Birch Ave.	Winnetka	Ill. 60091
23	Mr. K. E. Miller	2020 Walnut St.	Winnetka	Ill.	60091	Mr. K. E. Miller	2020 Walnut St.	Winnetka	Ill. 60091
24	Mr. L. F. Moore	2121 Spruce Dr.	Winnetka	Ill.	60091	Mr. L. F. Moore	2121 Spruce Dr.	Winnetka	Ill. 60091
25	Mr. M. G. Taylor	2222 Ash St.	Winnetka	Ill.	60091	Mr. M. G. Taylor	2222 Ash St.	Winnetka	Ill. 60091
26	Mr. N. H. White	2323 Dogwood Ave.	Winnetka	Ill.	60091	Mr. N. H. White	2323 Dogwood Ave.	Winnetka	Ill. 60091
27	Mr. O. I. Black	2424 Magnolia St.	Winnetka	Ill.	60091	Mr. O. I. Black	2424 Magnolia St.	Winnetka	Ill. 60091
28	Mr. P. J. Green	2525 Poplar Dr.	Winnetka	Ill.	60091	Mr. P. J. Green	2525 Poplar Dr.	Winnetka	Ill. 60091
29	Mr. Q. K. Hall	2626 Sycamore St.	Winnetka	Ill.	60091	Mr. Q. K. Hall	2626 Sycamore St.	Winnetka	Ill. 60091
30	Mr. R. L. King	2727 Chestnut Ave.	Winnetka	Ill.	60091	Mr. R. L. King	2727 Chestnut Ave.	Winnetka	Ill. 60091
31	Mr. S. M. Lee	2828 Elm St.	Winnetka	Ill.	60091	Mr. S. M. Lee	2828 Elm St.	Winnetka	Ill. 60091
32	Mr. T. N. Miller	2929 Oak Dr.	Winnetka	Ill.	60091	Mr. T. N. Miller	2929 Oak Dr.	Winnetka	Ill. 60091
33	Mr. U. O. Moore	3030 Maple St.	Winnetka	Ill.	60091	Mr. U. O. Moore	3030 Maple St.	Winnetka	Ill. 60091
34	Mr. V. P. Taylor	3131 Pine Ave.	Winnetka	Ill.	60091	Mr. V. P. Taylor	3131 Pine Ave.	Winnetka	Ill. 60091
35	Mr. W. Q. White	3232 Cedar St.	Winnetka	Ill.	60091	Mr. W. Q. White	3232 Cedar St.	Winnetka	Ill. 60091
36	Mr. X. R. Black	3333 Birch Dr.	Winnetka	Ill.	60091	Mr. X. R. Black	3333 Birch Dr.	Winnetka	Ill. 60091
37	Mr. Y. S. Green	3434 Walnut St.	Winnetka	Ill.	60091	Mr. Y. S. Green	3434 Walnut St.	Winnetka	Ill. 60091
38	Mr. Z. T. Hall	3535 Spruce Ave.	Winnetka	Ill.	60091	Mr. Z. T. Hall	3535 Spruce Ave.	Winnetka	Ill. 60091
39	Mr. A. U. King	3636 Ash St.	Winnetka	Ill.	60091	Mr. A. U. King	3636 Ash St.	Winnetka	Ill. 60091
40	Mr. B. V. Lee	3737 Dogwood Dr.	Winnetka	Ill.	60091	Mr. B. V. Lee	3737 Dogwood Dr.	Winnetka	Ill. 60091
41	Mr. C. W. Miller	3838 Magnolia St.	Winnetka	Ill.	60091	Mr. C. W. Miller	3838 Magnolia St.	Winnetka	Ill. 60091
42	Mr. D. X. Moore	3939 Poplar Ave.	Winnetka	Ill.	60091	Mr. D. X. Moore	3939 Poplar Ave.	Winnetka	Ill. 60091
43	Mr. E. Y. Taylor	4040 Sycamore St.	Winnetka	Ill.	60091	Mr. E. Y. Taylor	4040 Sycamore St.	Winnetka	Ill. 60091
44	Mr. F. Z. White	4141 Chestnut Dr.	Winnetka	Ill.	60091	Mr. F. Z. White	4141 Chestnut Dr.	Winnetka	Ill. 60091
45	Mr. G. A. Black	4242 Elm St.	Winnetka	Ill.	60091	Mr. G. A. Black	4242 Elm St.	Winnetka	Ill. 60091
46	Mr. H. B. Green	4343 Oak Ave.	Winnetka	Ill.	60091	Mr. H. B. Green	4343 Oak Ave.	Winnetka	Ill. 60091
47	Mr. I. C. Hall	4444 Maple St.	Winnetka	Ill.	60091	Mr. I. C. Hall	4444 Maple St.	Winnetka	Ill. 60091
48	Mr. J. D. King	4545 Pine Dr.	Winnetka	Ill.	60091	Mr. J. D. King	4545 Pine Dr.	Winnetka	Ill. 60091
49	Mr. K. E. Lee	4646 Cedar St.	Winnetka	Ill.	60091	Mr. K. E. Lee	4646 Cedar St.	Winnetka	Ill. 60091
50	Mr. L. F. Miller	4747 Birch Ave.	Winnetka	Ill.	60091	Mr. L. F. Miller	4747 Birch Ave.	Winnetka	Ill. 60091
51	Mr. M. G. Moore	4848 Walnut St.	Winnetka	Ill.	60091	Mr. M. G. Moore	4848 Walnut St.	Winnetka	Ill. 60091
52	Mr. N. H. Taylor	4949 Spruce Dr.	Winnetka	Ill.	60091	Mr. N. H. Taylor	4949 Spruce Dr.	Winnetka	Ill. 60091
53	Mr. O. I. White	5050 Ash St.	Winnetka	Ill.	60091	Mr. O. I. White	5050 Ash St.	Winnetka	Ill. 60091
54	Mr. P. J. Black	5151 Dogwood Ave.	Winnetka	Ill.	60091	Mr. P. J. Black	5151 Dogwood Ave.	Winnetka	Ill. 60091
55	Mr. Q. K. Green	5252 Magnolia St.	Winnetka	Ill.	60091	Mr. Q. K. Green	5252 Magnolia St.	Winnetka	Ill. 60091
56	Mr. R. L. Hall	5353 Poplar Dr.	Winnetka	Ill.	60091	Mr. R. L. Hall	5353 Poplar Dr.	Winnetka	Ill. 60091
57	Mr. S. M. King	5454 Sycamore St.	Winnetka	Ill.	60091	Mr. S. M. King	5454 Sycamore St.	Winnetka	Ill. 60091
58	Mr. T. N. Lee	5555 Chestnut Ave.	Winnetka	Ill.	60091	Mr. T. N. Lee	5555 Chestnut Ave.	Winnetka	Ill. 60091
59	Mr. U. O. Miller	5656 Elm St.	Winnetka	Ill.	60091	Mr. U. O. Miller	5656 Elm St.	Winnetka	Ill. 60091
60	Mr. V. P. Moore	5757 Oak Dr.	Winnetka	Ill.	60091	Mr. V. P. Moore	5757 Oak Dr.	Winnetka	Ill. 60091
61	Mr. W. Q. Taylor	5858 Maple St.	Winnetka	Ill.	60091	Mr. W. Q. Taylor	5858 Maple St.	Winnetka	Ill. 60091
62	Mr. X. R. White	5959 Pine Ave.	Winnetka	Ill.	60091	Mr. X. R. White	5959 Pine Ave.	Winnetka	Ill. 60091
63	Mr. Y. S. Black	6060 Cedar St.	Winnetka	Ill.	60091	Mr. Y. S. Black	6060 Cedar St.	Winnetka	Ill. 60091
64	Mr. Z. T. Green	6161 Birch Dr.	Winnetka	Ill.	60091	Mr. Z. T. Green	6161 Birch Dr.	Winnetka	Ill. 60091
65	Mr. A. U. Hall	6262 Walnut St.	Winnetka	Ill.	60091	Mr. A. U. Hall	6262 Walnut St.	Winnetka	Ill. 60091
66	Mr. B. V. King	6363 Spruce Ave.	Winnetka	Ill.	60091	Mr. B. V. King	6363 Spruce Ave.	Winnetka	Ill. 60091
67	Mr. C. W. Lee	6464 Ash St.	Winnetka	Ill.	60091	Mr. C. W. Lee	6464 Ash St.	Winnetka	Ill. 60091
68	Mr. D. X. Miller	6565 Dogwood Dr.	Winnetka	Ill.	60091	Mr. D. X. Miller	6565 Dogwood Dr.	Winnetka	Ill. 60091
69	Mr. E. Y. Moore	6666 Magnolia St.	Winnetka	Ill.	60091	Mr. E. Y. Moore	6666 Magnolia St.	Winnetka	Ill. 60091
70	Mr. F. Z. Taylor	6767 Poplar Ave.	Winnetka	Ill.	60091	Mr. F. Z. Taylor	6767 Poplar Ave.	Winnetka	Ill. 60091
71	Mr. G. A. White	6868 Sycamore St.	Winnetka	Ill.	60091	Mr. G. A. White	6868 Sycamore St.	Winnetka	Ill. 60091
72	Mr. H. B. Black	6969 Chestnut Dr.	Winnetka	Ill.	60091	Mr. H. B. Black	6969 Chestnut Dr.	Winnetka	Ill. 60091
73	Mr. I. C. Green	7070 Elm St.	Winnetka	Ill.	60091	Mr. I. C. Green	7070 Elm St.	Winnetka	Ill. 60091
74	Mr. J. D. Hall	7171 Oak Ave.	Winnetka	Ill.	60091	Mr. J. D. Hall	7171 Oak Ave.	Winnetka	Ill. 60091
75	Mr. K. E. King	7272 Maple St.	Winnetka	Ill.	60091	Mr. K. E. King	7272 Maple St.	Winnetka	Ill. 60091
76	Mr. L. F. Lee	7373 Pine Dr.	Winnetka	Ill.	60091	Mr. L. F. Lee	7373 Pine Dr.	Winnetka	Ill. 60091
77	Mr. M. G. Miller	7474 Cedar St.	Winnetka	Ill.	60091	Mr. M. G. Miller	7474 Cedar St.	Winnetka	Ill. 60091
78	Mr. N. H. Moore	7575 Birch Ave.	Winnetka	Ill.	60091	Mr. N. H. Moore	7575 Birch Ave.	Winnetka	Ill. 60091
79	Mr. O. I. Taylor	7676 Walnut St.	Winnetka	Ill.	60091	Mr. O. I. Taylor	7676 Walnut St.	Winnetka	Ill. 60091
80	Mr. P. J. White	7777 Spruce Dr.	Winnetka	Ill.	60091	Mr. P. J. White	7777 Spruce Dr.	Winnetka	Ill. 60091
81	Mr. Q. K. Black	7878 Ash St.	Winnetka	Ill.	60091	Mr. Q. K. Black	7878 Ash St.	Winnetka	Ill. 60091
82	Mr. R. L. Green	7979 Dogwood Ave.	Winnetka	Ill.	60091	Mr. R. L. Green	7979 Dogwood Ave.	Winnetka	Ill. 60091
83	Mr. S. M. Hall	8080 Magnolia St.	Winnetka	Ill.	60091	Mr. S. M. Hall	8080 Magnolia St.	Winnetka	Ill. 60091
84	Mr. T. N. King	8181 Poplar Dr.	Winnetka	Ill.	60091	Mr. T. N. King	8181 Poplar Dr.	Winnetka	Ill. 60091
85	Mr. U. O. Lee	8282 Sycamore St.	Winnetka	Ill.	60091	Mr. U. O. Lee	8282 Sycamore St.	Winnetka	Ill. 60091
86	Mr. V. P. Miller	8383 Chestnut Ave.	Winnetka	Ill.	60091	Mr. V. P. Miller	8383 Chestnut Ave.	Winnetka	Ill. 60091
87	Mr. W. Q. Moore	8484 Elm St.	Winnetka	Ill.	60091	Mr. W. Q. Moore	8484 Elm St.	Winnetka	Ill. 60091
88	Mr. X. R. Taylor	8585 Oak Dr.	Winnetka	Ill.	60091	Mr. X. R. Taylor	8585 Oak Dr.	Winnetka	Ill. 60091
89	Mr. Y. S. White	8686 Maple St.	Winnetka	Ill.	60091	Mr. Y. S. White	8686 Maple St.	Winnetka	Ill. 60091
90	Mr. Z. T. Black	8787 Pine Ave.	Winnetka	Ill.	60091	Mr. Z. T. Black	8787 Pine Ave.	Winnetka	Ill. 60091
91	Mr. A. U. Green	8888 Cedar St.	Winnetka	Ill.	60091	Mr. A. U. Green	8888 Cedar St.	Winnetka	Ill. 60091
92	Mr. B. V. Hall	8989 Birch Dr.	Winnetka	Ill.	60091	Mr. B. V. Hall	8989 Birch Dr.	Winnetka	Ill. 60091
93	Mr. C. W. King	9090 Walnut St.	Winnetka	Ill.	60091	Mr. C. W. King	9090 Walnut St.	Winnetka	Ill. 60091
94	Mr. D. X. Lee	9191 Spruce Ave.	Winnetka	Ill.	60091	Mr. D. X. Lee	9191 Spruce Ave.	Winnetka	Ill. 60091
95	Mr. E. Y. Miller	9292 Ash St.	Winnetka	Ill.	60091	Mr. E. Y. Miller	9292 Ash St.	Winnetka	Ill. 60091
96	Mr. F. Z. Moore	9393 Dogwood Dr.	Winnetka	Ill.	60091	Mr. F. Z. Moore	9393 Dogwood Dr.	Winnetka	Ill. 60091
97	Mr. G. A. Taylor	9494 Magnolia St.	Winnetka	Ill.	60091	Mr. G. A. Taylor	9494 Magnolia St.	Winnetka	Ill. 60091
98	Mr. H. B. White	9595 Poplar Ave.	Winnetka	Ill.	60091	Mr. H. B. White	9595 Poplar Ave.	Winnetka	Ill. 60091
99	Mr. I. C. Black	9696 Sycamore St.	Winnetka	Ill.	60091	Mr. I. C. Black	9696 Sycamore St.	Winnetka	Ill. 60091
100	Mr. J. D. Green	9797 Chestnut Dr.	Winnetka	Ill.	60091	Mr. J. D. Green	9797 Chestnut Dr.	Winnetka	Ill. 60091

TABLE VIII (Continued)
ISSUES OF \$100,000 TO \$499,000

Date of sale	District	Equalized valuation	Total net debt	Ratio to valuation	New issue	Net interest cost
3/24/55	Yorkville Rose & Richland #9	1,894,150	100,000	5.28	100,000	2.331
7/28/54	Pottersville	1,859,791	181,000	9.75	170,000	2.394
1/12/55	Honor Rur Agr.	1,828,461	218,800	11.97	185,000	2.717
1/12/55	Arenac Rural Agr.	1,824,250	220,000	12.05	220,000	2.850
7/6/55	Detour Twp. #1	1,674,509	160,000	9.56	160,000	3.990
8/25/54	Elsie	1,615,924	193,900	12.00	183,000	2.340
5/19/55	Deford Comm. Sch.	1,594,875	125,000	7.84	125,000	2.488
9/22/54	Buena Vista #6	1,581,299	180,000	11.38	180,000	3.500
8/5/54	Superior Bay Mills	1,536,354	110,000	7.16	110,000	2.863
7/20/55	Boston & Berlin #3 Frl	1,516,510	183,693	12.11	150,000	2.863
6/2/55	Brownstone, etc, Wayne	1,337,773	100,000	7.48	100,000	2.745
8/2/54	Chesterfield, Macomb #12	1,294,072	150,000	11.59	150,000	2.730
1/4/55	Eggleson #4	1,015,550	135,000	13.29	135,000	2.665
10/8/54	Brownstone #7	1,015,531	120,000	11.82	120,000	2.720
11/29/54	St. Joe Valley #21	832,911	120,000	14.41	120,000	2.690

TABLE IX

ISSUES OF \$500,000 to \$1,000,000

Date of sale	District	Equalized valuation	Total net debt	Ratio to valuation	New issue	Net interest cost
5/12/55	Lincoln Park	51,658,672	4,049,672	7.54	500,000	2.530
8/9/55	Berkley	44,687,420	2,980,000	5.95	500,000	2.617
7/1/54	Marysville	42,440,223	905,000	2.13	800,000	1.514
7/26/54	Warren Twp Sch	31,906,487	1,522,456	4.77	600,000	2.150
7/11/55	Union Sch Owosso	31,791,478	958,165	3.01	500,000	2.408
8/30/54	Redford Union	30,610,952	2,500,000	8.17	900,000	2.557
1/24/55	Walled Lake	27,326,055	1,873,895	6.86	550,000	2.810
7/7/54	Roseville	19,556,997	1,695,600	8.67	500,000	2.284
7/14/55*	Jefferson Consol Monroe	15,909,343	904,372	5.68	700,000	3.490
7/6/54	Reeths Puffer R A	14,937,944	821,300	5.50	690,000	2.214
4/25/55	Bangor Twp Bay	14,374,802	518,548	3.61	500,000	1.749
4/28/55	Rogers Union Sch	13,233,582	600,000	8.41	600,000	2.473
10/27/54	Ecorse Twp # 7	12,798,140	1,075,000	8.40	530,000	1.837
10/5/54	Mt. Morris Genesee # 2	12,615,261	1,070,000	8.48	950,000	1.963

TABLE IX (continued)
ISSUES OF \$500,000 to \$1,000,000

Date of sale	District	Equalized valuation	Total net debt	Ratio to valuation	New issue	Net interest cost
12/16/54	Ecorse McCann # 8	10,625,840	1,209,879	11.39	500,000	2.635
9/9/54	Howell	10,102,278	900,000	8.91	900,000	1.716
11/9/54	L'Anse Creuse	9,375,242	1,116,000	11.90	850,000	2.704
7/19/54	South Lyons	8,258,374	713,000	8.63	540,000	3.480
7/8/54	Big Rapids	8,096,166	660,000	8.15	660,000	1.918
2/10/55	Stockbridge Comm Agr	7,977,020	692,000	8.67	665,000	2.523
9/21/54	Buena Vista Ricker Sch	7,749,072	883,958	11.87	750,000	2.02
5/25/55	Anchor Bay	7,720,896	1,040,000	10.36	800,000	2.610
7/19/55	Northwest R A # 6	7,490,166	700,000	9.35	700,000	3.058
7/7/54	Avondale	7,431,307	841,500	11.32	550,000	2.64
9/30/54	Montague Consol	7,027,526	688,000	9.79	600,000	2.04
8/19/54	Fowlerville	5,573,449	550,000	9.87	550,000	2.113
4/26/55	Armada Richmond # 2	5,500,645	609,000	11.07	600,000	2.306
1/5/55	Oskemos	4,901,148	525,000	10.71	525,000	2.065

* Unlimited and qualified.

TABLE X
ISSUES OF \$1,000,000 OR MORE

Date of sale	District	Equalized valuation	Total net debt	Ratio to valuation	New issue	Net interest cost
1/12/55	Pontiac Sch Dist	211,648,090	3,282,000	1.55	2,100,000	1.612
8/18/54	Grosse Pt R A	166,034,480	6,138,817	3.70	1,225,000	1.186
6/29/55*	Royal Oak	160,430,553	5,779,633	3.60	2,000,000	3.112
9/14/54	Birmingham	103,921,840	6,238,000	6.00	1,750,000	2.018
12/7/54	Birmingham	103,921,840	7,975,000	7.67	1,750,000	1.978
9/15/54	Wyandotte	95,647,185	9,428,534	9.86	7,250,000	2.226
1/1/55	Trenton	59,253,627	4,500,000	7.59	4,500,000	2.130
3/15/55	Warren # 5	58,802,451	3,245,000	4.72	1,100,000	2.526
7/19/55	Plymouth	48,772,544	3,577,544	7.34	3,000,000	2.996
8/31/54	Lincoln Park	47,352,046	3,972,293	8.39	1,500,000	3.021
2/3/55	Redford	45,159,325	4,288,000	9.50	2,250,000	2.650
8/4/54	Montogue # 2	33,098,578	3,250,000	9.82	3,250,000	1.861
7/8/54	Farmington	24,881,938	2,869,000	11.53	1,500,000	2.345
6/9/55	Huron Valley	24,108,397	1,700,289	7.05	1,250,000	2.637
1/13/55	Mt. Pleasant	15,071,220	1,500,000	9.95	1,500,000	2.177
8/24/54	Romulus	12,000,500	1,389,795	11.58	1,300,000	2.528

* Unlimited and not qualified.

TABLE XI
ISSUES OF DEBT TO VALUATION RATIO OF 10% OR MORE

Date of sale	District	Equalized valuation	Total net debt	Ratio of debt to valuation	Bond issue amount	Net interest cost
12/29/54	Summitt Napoleon Liberty	815,730	32,000	14.83	32,000	3.013
11/29/54	St. Joe Valley # 21	832,911	120,000	14.41	120,000	2.690
9/13/54	Fairhaven McKinley	399,300	55,000	13.77	55,000	2.500
9/22/54	Swan Creek	153,600	21,000	13.67	21,000	3.090
11/17/54	Kalamazoo Twp. # 2	3,595,000	486,000	13.52	247,000	2.200
1/4/55	Eggleston # 4	1,015,550	135,000	13.29	135,000	2.665
8/11/54	Spaulding # 6	706,415	91,600	12.97	34,000	2.720
12/3/54	Mt. Morris # 11	390,430	50,000	12.81	50,000	2.918
12/16/54	North Huron R.A.	2,484,078	317,000	12.76	300,000	2.394
10/12/54	Buena Vista # 5	480,573	61,000	12.69	61,000	3.228
10/13/54	Birch Run Area Sch	2,444,514	300,000	12.27	300,000	2.266
10/14/54	Saginaw # 3	3,133,215	384,226	12.26	315,000	2.083
7/20/55	Boston & Berlin Ionia	1,516,510	183,693	12.11	150,000	2.863
1/12/55	Arenac R.A.	1,824,250	220,000	12.05	220,000	2.850

DATE	DESCRIPTION	AMOUNT	DEBIT	CREDIT	BALANCE
1/1/50	WALTON L. L.	100.00			100.00
1/15/50	WALTON L. L.	100.00			200.00
1/30/50	WALTON L. L.	100.00			300.00
2/15/50	WALTON L. L.	100.00			400.00
3/1/50	WALTON L. L.	100.00			500.00
3/15/50	WALTON L. L.	100.00			600.00
3/30/50	WALTON L. L.	100.00			700.00
4/15/50	WALTON L. L.	100.00			800.00
4/30/50	WALTON L. L.	100.00			900.00
5/15/50	WALTON L. L.	100.00			1000.00
5/30/50	WALTON L. L.	100.00			1100.00
6/15/50	WALTON L. L.	100.00			1200.00
6/30/50	WALTON L. L.	100.00			1300.00
7/15/50	WALTON L. L.	100.00			1400.00
7/30/50	WALTON L. L.	100.00			1500.00
8/15/50	WALTON L. L.	100.00			1600.00
8/30/50	WALTON L. L.	100.00			1700.00
9/15/50	WALTON L. L.	100.00			1800.00
9/30/50	WALTON L. L.	100.00			1900.00
10/15/50	WALTON L. L.	100.00			2000.00
10/30/50	WALTON L. L.	100.00			2100.00
11/15/50	WALTON L. L.	100.00			2200.00
11/30/50	WALTON L. L.	100.00			2300.00
12/15/50	WALTON L. L.	100.00			2400.00
12/30/50	WALTON L. L.	100.00			2500.00
1/1/51	WALTON L. L.	100.00			2600.00
1/15/51	WALTON L. L.	100.00			2700.00
1/30/51	WALTON L. L.	100.00			2800.00
2/15/51	WALTON L. L.	100.00			2900.00
2/30/51	WALTON L. L.	100.00			3000.00
3/1/51	WALTON L. L.	100.00			3100.00
3/15/51	WALTON L. L.	100.00			3200.00
3/30/51	WALTON L. L.	100.00			3300.00
4/15/51	WALTON L. L.	100.00			3400.00
4/30/51	WALTON L. L.	100.00			3500.00
5/15/51	WALTON L. L.	100.00			3600.00
5/30/51	WALTON L. L.	100.00			3700.00
6/15/51	WALTON L. L.	100.00			3800.00
6/30/51	WALTON L. L.	100.00			3900.00
7/15/51	WALTON L. L.	100.00			4000.00
7/30/51	WALTON L. L.	100.00			4100.00
8/15/51	WALTON L. L.	100.00			4200.00
8/30/51	WALTON L. L.	100.00			4300.00
9/15/51	WALTON L. L.	100.00			4400.00
9/30/51	WALTON L. L.	100.00			4500.00
10/15/51	WALTON L. L.	100.00			4600.00
10/30/51	WALTON L. L.	100.00			4700.00
11/15/51	WALTON L. L.	100.00			4800.00
11/30/51	WALTON L. L.	100.00			4900.00
12/15/51	WALTON L. L.	100.00			5000.00
12/30/51	WALTON L. L.	100.00			5100.00
1/1/52	WALTON L. L.	100.00			5200.00
1/15/52	WALTON L. L.	100.00			5300.00
1/30/52	WALTON L. L.	100.00			5400.00
2/15/52	WALTON L. L.	100.00			5500.00
2/30/52	WALTON L. L.	100.00			5600.00
3/1/52	WALTON L. L.	100.00			5700.00
3/15/52	WALTON L. L.	100.00			5800.00
3/30/52	WALTON L. L.	100.00			5900.00
4/15/52	WALTON L. L.	100.00			6000.00
4/30/52	WALTON L. L.	100.00			6100.00
5/15/52	WALTON L. L.	100.00			6200.00
5/30/52	WALTON L. L.	100.00			6300.00
6/15/52	WALTON L. L.	100.00			6400.00
6/30/52	WALTON L. L.	100.00			6500.00
7/15/52	WALTON L. L.	100.00			6600.00
7/30/52	WALTON L. L.	100.00			6700.00
8/15/52	WALTON L. L.	100.00			6800.00
8/30/52	WALTON L. L.	100.00			6900.00
9/15/52	WALTON L. L.	100.00			7000.00
9/30/52	WALTON L. L.	100.00			7100.00
10/15/52	WALTON L. L.	100.00			7200.00
10/30/52	WALTON L. L.	100.00			7300.00
11/15/52	WALTON L. L.	100.00			7400.00
11/30/52	WALTON L. L.	100.00			7500.00
12/15/52	WALTON L. L.	100.00			7600.00
12/30/52	WALTON L. L.	100.00			7700.00
1/1/53	WALTON L. L.	100.00			7800.00
1/15/53	WALTON L. L.	100.00			7900.00
1/30/53	WALTON L. L.	100.00			8000.00
2/15/53	WALTON L. L.	100.00			8100.00
2/30/53	WALTON L. L.	100.00			8200.00
3/1/53	WALTON L. L.	100.00			8300.00
3/15/53	WALTON L. L.	100.00			8400.00
3/30/53	WALTON L. L.	100.00			8500.00
4/15/53	WALTON L. L.	100.00			8600.00
4/30/53	WALTON L. L.	100.00			8700.00
5/15/53	WALTON L. L.	100.00			8800.00
5/30/53	WALTON L. L.	100.00			8900.00
6/15/53	WALTON L. L.	100.00			9000.00
6/30/53	WALTON L. L.	100.00			9100.00
7/15/53	WALTON L. L.	100.00			9200.00
7/30/53	WALTON L. L.	100.00			9300.00
8/15/53	WALTON L. L.	100.00			9400.00
8/30/53	WALTON L. L.	100.00			9500.00
9/15/53	WALTON L. L.	100.00			9600.00
9/30/53	WALTON L. L.	100.00			9700.00
10/15/53	WALTON L. L.	100.00			9800.00
10/30/53	WALTON L. L.	100.00			9900.00
11/15/53	WALTON L. L.	100.00			10000.00
11/30/53	WALTON L. L.	100.00			10100.00
12/15/53	WALTON L. L.	100.00			10200.00
12/30/53	WALTON L. L.	100.00			10300.00
1/1/54	WALTON L. L.	100.00			10400.00
1/15/54	WALTON L. L.	100.00			10500.00
1/30/54	WALTON L. L.	100.00			10600.00
2/15/54	WALTON L. L.	100.00			10700.00
2/30/54	WALTON L. L.	100.00			10800.00
3/1/54	WALTON L. L.	100.00			10900.00
3/15/54	WALTON L. L.	100.00			11000.00
3/30/54	WALTON L. L.	100.00			11100.00
4/15/54	WALTON L. L.	100.00			11200.00
4/30/54	WALTON L. L.	100.00			11300.00
5/15/54	WALTON L. L.	100.00			11400.00
5/30/54	WALTON L. L.	100.00			11500.00
6/15/54	WALTON L. L.	100.00			11600.00
6/30/54	WALTON L. L.	100.00			11700.00
7/15/54	WALTON L. L.	100.00			11800.00
7/30/54	WALTON L. L.	100.00			11900.00
8/15/54	WALTON L. L.	100.00			12000.00
8/30/54	WALTON L. L.	100.00			12100.00
9/15/54	WALTON L. L.	100.00			12200.00
9/30/54	WALTON L. L.	100.00			12300.00
10/15/54	WALTON L. L.	100.00			12400.00
10/30/54	WALTON L. L.	100.00			12500.00
11/15/54	WALTON L. L.	100.00			12600.00
11/30/54	WALTON L. L.	100.00			12700.00
12/15/54	WALTON L. L.	100.00			12800.00
12/30/54	WALTON L. L.	100.00			12900.00
1/1/55	WALTON L. L.	100.00			13000.00

WALTON L. L. 100.00 13000.00

WALTON L. L.

TABLE XI (continued)

ISSUES OF DEBT TO VALUATION RATIO OF 10% OR MORE

Date of sale	District	Equalized valuation	Total net debt	Ratio of debt to valuation	Bond issue amount	Net interest cost
8/25/54	Elsie	1,615,924	193,900	12.00	183,000	2.340
1/12/55	Honor R A	1,828,461	218,800	11.97	185,000	2.717
11/9/54	L'Anse Creuse	9,375,242	1,116,000	11.90	850,000	2.704
9/21/54	Buena Vista # 1	7,442,072	883,958	11.87	750,000	2.020
7/21/54	Ada Twp # 4	177,071	21,000	11.86	21,000	3.094
10/11/54	Brown Stone Twp # 7	1,015,531	120,000	11.82	120,000	2.720
8/26/54	Hillman R A	2,455,480	290,000	11.81	290,000	2.775
8/20/54	Chesterfield Macomb	1,294,072	150,000	11.59	150,000	2.730
2/1/55	Spaulding # 2	553,009	64,112	11.59	40,000	3.195
8/2/54	Romulus	12,000,500	1,389,795	11.58	1,300,000	2.528
7/8/54	Farmington	24,881,938	2,869,063	11.53	1,500,000	2.346
7/5/55	Owosso #5	393,754	45,000	11.43	45,000	3.110

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	12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TABLE XI (continued)

ISSUES OF DEBT TO VALUATION RATIO OF 10% OR MORE

Date of sale	District	Equalized valuation	Total net debt	Ratio of debt to valuation	Bond issue amount	Net interest cost
12/16/54	Ecorse McCann	10,625,840	1,209,879	11.39	500,000	2.635
9/22/54	Buena Vista #6	1,581,299	180,000	11.38	180,000	3.500
9/30/54	Farmington Redford	8,070,501	915,000	11.34	350,000	2.997
7/7/54	Avondale	7,431,307	841,500	11.32	550,000	2.640
2/2/55	Old Mission Peninsula	2,668,205	300,000	11.24	300,000	2.594
7/15/54	Cassopolis	2,818,700	314,000	11.14	250,000	2.413
4/26/55	Armada Richmond # 2	5,500,645	609,000	11.07	600,000	2.306
7/7/55	Pennfield Agr # 1	5,625,476	616,015	10.95	395,000	2.847
8/2/54	Grand Haven # 4	236,547	26,000	10.90	26,000	3.065
1/5/55	Okemos	4,901,148	525,000	10.71	525,000	2.065
9/2/54	Lake Fenton	4,762,734	508,000	10.67	495,000	2.350
2/2/55	Thomas & James #4	1,392,989	148,000	10.62	75,000	2.968
2/24/55	Saginaw \$ 6	3,307,842	350,000	10.58	350,000	2.648
8/23/54	Deerfield Marathon # 5	477,849	50,000	10.46	50,000	2.970
8/16/54	Barfield Twp	1,977,750	205,250	10.38	200,000	2.930
5/25/55	Anbhor Bay Agr	7,720,896	1,040,000	10.36	800,000	2.611
7/14/54	Paris Twp Sch Bowen	1,129,743	116,000	10.27	75,000	2.800
11/8/54	Porter Twp # 1	635,865	65,000	10.22	65,000	2.910
6/9/55	Bertrand # 6 Berrien Cty	345,644	35,000	10.13	35,000	2.658
3/23/55	Montrose Twp	2,693,647	257,000	10.11	130,000	2.395
11/10/54	Eureka # 3	267,282	27,000	10.10	27,000	2.941
2/9/55	Wright Twp Sch	3,480,136	350,000	10.06	350,000	2.558

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TABLE XII

ISSUES OF DEBT TO VALUATION RATIO OF 5% OR LESS

Date of	District	Equalized valuation	Total net debt	Ratio of debt to valuation	Bond issue amount	Net interest cost
4/28/55	Benona Community Sch	1,610,844	80,000	4.97	80,000	2.686
8/9/54	Coloma Hogart Covert # 8	741,909	36,000	4.85	36,000	2.644
7/16/54	Warren Twp Sch	31,906,487	1,522,456	4.77	600,000	2.150
5/17/55	Hastings Carlton Twp	504,928	24,000	4.75	24,000	2.110
3/15/55	Warren # 5	58,802,451	3,245,000	4.72	1,100,000	2.526
4/7/55	Caseville # 1	4,765,786	215,500	4.52	200,000	2.490
7/18/55	City of Ionia	12,257,936	551,700	4.50	350,000	2.557
7/13/55	Holland # 7 Park	2,023,335	91,000	4.50	65,000	2.717
4/6/55	James Couzens R A	3,551,750	158,000	4.45	65,000	2.398
4/12/55	Grand Rapids	5,577,668	244,971	4.39	105,000	2.340
4/19/55	Monitor Twp # 2	1,215,666	53,000	4.36	53,000	2.420
7/28/54	Whitmore Lake	2,658,012	120,000	4.29	100,000	2.183
1/12/55	Lakeview	16,247,605	675,000	4.15	350,000	1.493
12/8/54	Wayland	5,247,507	211,000	4.02	200,000	2.136
1/19/55	Three Rivers	13,144,175	514,937	3.92	310,000	2.112
8/18/54	Grosse Pt. R A	166,034,480	6,138,817	3.70	1,225,000	1.186
4/25/55	Bangor Twp Bay City	14,374,802	518,548	3.61	500,000	1.749
6/29/55	Royal Oak	160,439,553	5,779,633	3.60	2,000,000	3.112
8/5/54	Three Oaks	5,225,411	170,000	3.25	170,000	1.689

TABLE XII (continued)

ISSUES OF DEBT TO VALUATION RATIO OF 5% OR LESS

Date of sale	District	Equalized valuation	Total net debt	Ratio of debt to valuation	Bond issue amount	Net interest cost
7/1/54	Dryden Community Sch	1,439,407	46,000	3.20	37,000	2.919
1/12/55	Remus Consolidated	2,141,612	74,000	3.17	50,000	1.743
7/11/55	Union Sch Owosso	3,179,478	958,165	3.01	500,000	2.408
7/11/55	Silver Creek Twp # 5	1,545,394	45,000	2.91	45,000	2.910
4/18/55	Volivia Wayne Penn	1,746,922	50,000	2.86	50,000	2.670
4/13/55	Park Laketown # 8	2,152,416	58,450	2.72	40,000	2.093
5/10/55	Elkton Unit Sch	2,297,939	67,000	2.69	40,000	2.104
4/12/55	Essex Fulten Wash	1,513,485	38,000	2.51	38,000	2.345
9/14/54	Hartland	3,299,662	93,000	2.32	60,000	1.729
7/1/54	Marysville	42,440,223	905,000	2.13	800,000	1.514
10/26/54	Fruitport # 5	2,006,706	40,000	1.99	40,000	1.650
5/2/55	Walker Twp # 11	6,036,355	117,000	1.94	60,000	2.222
1/20/55	Harbor Springs	7,019,705	125,000	1.78	125,000	1.597
1/12/55	Pontiac	211,648,090	3,282,000	1.55	2,100,000	1.612
7/7/55	Deckerville Comm Sch	10,970,786	162,000	1.48	100,000	2.265
10/18/54	Milton # 5	202,050	30,000	1.48	30,000	2.648
3/28/55	Cherry Beach # 2	3,736,138	50,000	1.34	50,000	2.715

TABLE XIII

COMPARISON OF NATIONAL AVERAGE NET INTEREST COST
TO BOND ISSUES WITH DEBT RATIO GREATER THAN 10%

Date of issue	Net interest cost	Average monthly net interest cost	Date of issue	Net interest cost	Average monthly net interest cost
7/7/54	2.64	2.40	8/26/54	2.775*	2.26
7/8/54	2.346	2.40	9/2/54	2.35	2.26
7/14/54	2.80	2.40	9/13/54	2.50	2.26
7/15/54	2.413	2.40	9/21/54	2.02	2.26
7/21/54	3.094*	2.40	9/22/54	3.09	2.26
8/2/54	2.73	2.26	9/22/54	3.50*	2.26
8/11/54	2.528	2.26	9/30/54	2.997	2.26
8/2/54	3.065	2.26	10/8/54	2.72	2.35
8/11/54	2.720	2.26	10/12/54	3.228	2.35
8/16/54	2.93*	2.26	10/13/54	2.266	2.35
8/23/54	2.97	2.26	10/14/54	2.083	2.35
8/25/54	2.34	2.26	11/8/54	2.91	2.33

TABLE XIII (continued)

COMPARISON OF NATIONAL AVERAGE NET INTEREST COST
TO BOND ISSUES WITH DEBT RATIO GREATER THAN 10%

Date of issue	Net interest cost	Average monthly net interest cost	Date of issue	Net interest cost	Average monthly net interest cost
11/9/54	2.704	2.33	2/1/55	3.195*	2.43
11/10/54	2.941*	2.33	2/2/55	2.594	2.43
11/17/54	2.20	2.33	2/2/55	2.968*	2.43
11/29/54	2.690	2.33	2/9/55	2.558	2.43
12/31/54	2.918*	2.33	2/24/55	2.648	2.43
12/16/54	2.394	2.33	3/23/55	2.395	2.45
12/16/54	2.635	2.33	4/26/55	2.306	2.42
12/29/54	3.013	2.33	5/25/55	2.611	2.39
1/4/55	2.665	2.38	6/9/55	2.658	2.39
1/5/55	2.065	2.38	7/5/55	3.11*	2.53
1/12/55	2.717	2.38	7/7/55	2.847	2.53
1/12/55	2.850	2.38	7/20/55	2.863	2.53

* Issues exceeding average net interest cost by more than .5%

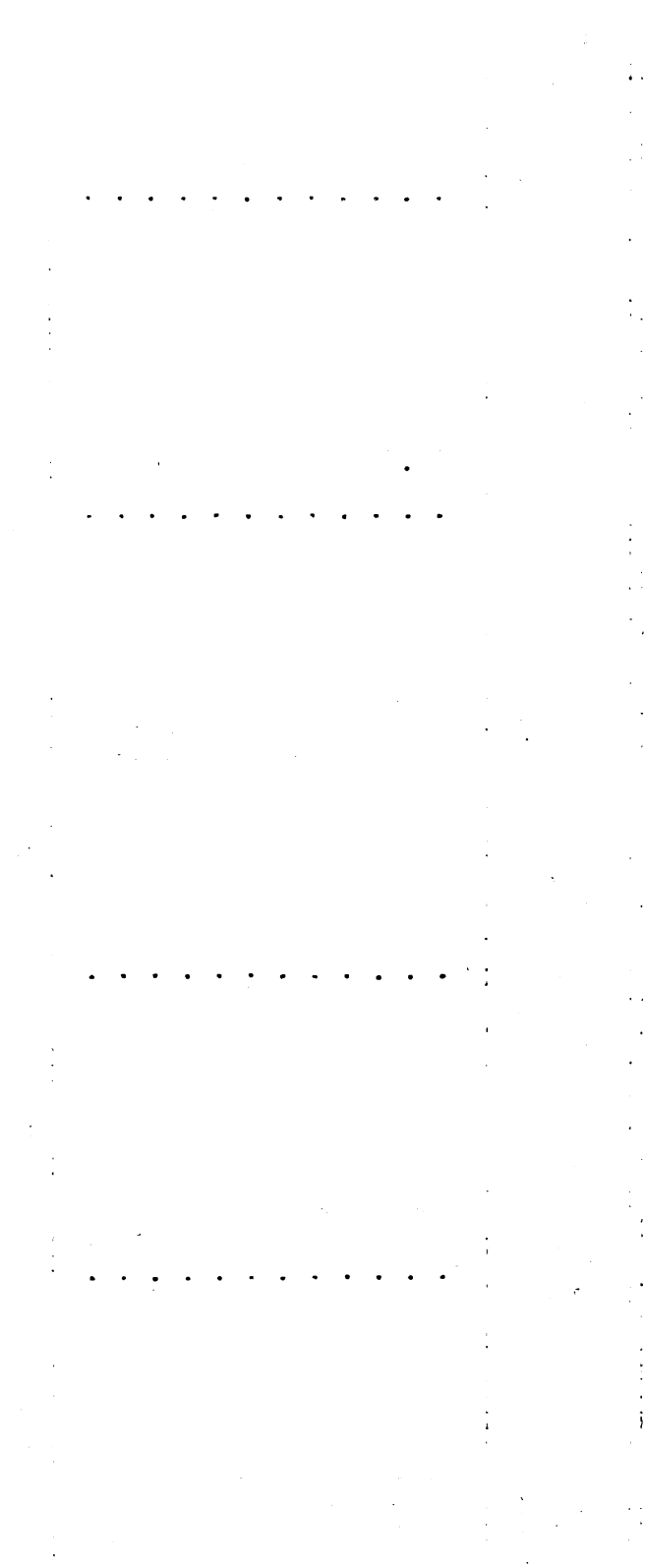


TABLE XIV

COMPARISON OF NATIONAL NET INTEREST COST TO
BOND ISSUES WITH DEBT RATIO OF 5% OR LESS

Date of issue	Bond net interest cost	National average net interest cost	Date of issue	Bond net interest cost	National average net interest cost
7/1/54	2.919	2.40	4/6/55	2.398	2.42
7/1/54	1.514*	2.40	4/7/55	2.490	2.42
7/16/54	2.150	2.40	4/12/55	2.345	2.42
7/28/54	2.183*	2.40	4/13/55	2.093	2.42
8/5/54	1.689*	2.26	4/18/55	2.670	2.42
8/9/54	2.644	2.26	4/19/55	2.420	2.42
8/18/54	1.186*	2.26	4/25/55	1.749*	2.42
9/14/54	1.729	2.26	4/28/55	2.686	2.42
10/18/54	2.648	2.35	5/2/55	2.222	2.39
10/26/54	1.650*	2.35	5/10/55	2.104	2.39
12/8/54	2.138	2.33	5/17/55	2.110	2.39
1/12/55	1.493*	2.38	6/29/55	3.112	2.39
1/12/55	1.743*	2.38	7/7/55	2.265	2.53
1/12/55	1.612*	2.38	7/11/55	2.910	2.53
1/19/55	2.112	2.38	7/11/55	2.408	2.53
1/20/55	1.597*	2.38	7/13/55	2.717	2.53
3/15/55	2.526	2.45	7/18/55	2.557	2.53
3/28/55	2.715	2.45			

* Issues bearing interest rates less than national average by an amount greater than .5%.

TABLE XV
RELATIONSHIP OF THE NET INTEREST COST TO PERCENTAGE OF CALLABLE BONDS

Issue	Net Interest cost	Percentage callable	Issue	Net Interest cost	Percentage callable
1	3.00	0	21	2.1037	45
2	2.2649	0	22	2.8627	46
3	1.74912	0	23	3.2279	46
4	1.597	20	24	2.2264	46
5	3.1124	22	25	1.716	46
6	1.4932	26	26	2.5574	46
7	1.837	28	27	2.3455	47
8	2.8676	35	28	2.42	47
9	2.500	36	29	2.7204	47
10	2.0188	36	30	2.4855	48
11	2.6172	37	31	2.0829	48
12	1.9716	38	32	2.72	48
13	3.065	39	33	3.09	48
14	1.514	40	34	3.48	48
15	2.2657	41	35	2.2843	49
16	1.9786	41	36	3.4302	50
17	2.644	42	37	2.289	50
18	2.500	43	38	1.65	50
19	2.8095	44	39	1.9628	50
20	1.9367	44	40	1.729	50

TABLE IV (Continued)
RELATIONSHIP OF THE NET INTEREST COST TO PERCENTAGE OF CALLABLE BONDS

Issue	Net interest cost	Percentage callable	Issue	Net interest cost	Percentage callable
41	2.97	50	61	3.02179	59
42	2.42883	50	62	2.5111	60
43	2.613	51	63	2.462	60
44	1.612	51	64	2.5537	60
45	2.7146	52	65	2.43049	60
46	2.918	52	66	2.5725	60
47	1.86147	52	67	2.036	60
48	2.72	53	68	2.0232	60
49	2.35	53	69	3.50	60
50	2.27	54	70	3.10	60
51	2.6517	54	71	2.3062	63
52	2.3979	55	72	2.3308	64
53	2.99727	55	73	2.488	64
54	2.14966	55	74	3.00	64
55	2.62	56	75	2.408	66
56	2.528	57	76	2.6347	66
57	2.4814	57	77	2.50	66
58	2.1103	58	78	2.8835	67
59	2.60986	58	79	2.557	67
60	2.395	58	80	2.75	67

.....

[illegible]

TABLE IV (Continued)
RELATIONSHIP OF THE NET INTEREST COST TO PERCENTAGE OF CALLABLE BONDS

Issue	Net interest cost	Percentage callable	Issue	Net interest cost	Percentage callable
81	3.058	68	101	2.665	74
82	2.4587	68	102	2.67631	75
83	2.621	68	103	2.1383	75
84	2.02	69	104	2.85	75
85	3.99	70	105	1.91787	75
86	2.1444	70	106	2.5585	76
87	2.0928	70	107	2.9934	76
88	2.521	70	108	3.0129	76
89	2.469	71	109	2.9188	76
90	2.589	71	110	2.3902	76
91	1.6889	71	111	2.467	76
92	3.139	72	112	3.094	76
93	2.529	72	113	2.91	77
94	1.743	72	114	2.0285	77
95	2.93	72	115	2.693	77
96	2.94	72	116	2.5482	77
97	2.745	73	117	2.4862	77
98	2.3396	73	118	3.24	77
99	2.526	73	119	2.9967	78
100	2.11886	74	120	2.77	78

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TABLE XV (Continued)
RELATIONSHIP OF THE NET INTEREST COST TO PERCENTAGE OF CALLABLE BONDS

Issue	Net interest cost	Percentage callable	Issue	Net interest cost	Percentage callable
121	2.91	78	141	2.4744	80
122	2.84675	78	142	2.1517	80
123	2.60986	78	143	2.44	80
124	2.43	78	144	2.67	80
125	2.3449	78	145	2.975	80
126	2.25	78	146	2.4123	80
127	2.13017	78	147	3.1946	80
128	3.3131	78	148	2.594	80
129	2.6304	78	149	2.96788	80
130	2.775	78	150	2.5582	80
131	1.1867	78	151	2.648	80
132	2.1831	78	152	2.34472	80
133	2.686	79	153	2.21	80
134	2.473	79	154	2.68	80
135	2.5233	79	155	3.00	80
136	2.1777	79	156	2.20	80
137	2.233	79	157	2.1651	80
138	3.1689	79	158	2.4172	80
139	2.6576	80	159	2.1166	80
140	2.4881	80	160	2.59	80

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	12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TABLE IV (Continued)

RELATIONSHIP OF THE NET INTEREST COST TO PERCENTAGE OF CALLABLE BONDS

Issue	Net interest cost	Percentage callable	Issue	Net interest cost	Percentage callable
161	2.1131	80	181	3.934	84
162	2.80	80	182	2.6901	84
163	2.2144	80	183	2.34	84
164	2.49	81	184	3.8485	84
165	2.458	81	185	2.4859	85
166	2.1817	81	186	2.0649	86
167	2.477	81	187	2.64	86
168	2.724	81	188	2.04	87
169	2.94147	81	189	2.3943	87
170	3.1429	81	190	2.7039	88
171	2.1533	81	191	3.8252	88
172	2.60	82	192	2.4123	88
173	2.717	82	193	2.303	88
174	2.3936	82	194	2.65097	88
175	2.153	82	195	2.73	89
176	2.2197	82	196	3.2589	90
177	2.637	83	197	2.65026	90
178	2.22	83	198	2.648	90
179	2.62	83	199	3.11	93
180	3.490	84	200	3.00	97

Continued on page 3

1. The first part of the report is a summary of the work done during the year.

Date	Description	Amount	Balance	Total	Total
1911-12	Jan 1 Balance	100.00	100.00	100.00	100.00
1912-13	Feb 1 Balance	100.00	100.00	100.00	100.00
1913-14	Mar 1 Balance	100.00	100.00	100.00	100.00
1914-15	Apr 1 Balance	100.00	100.00	100.00	100.00
1915-16	May 1 Balance	100.00	100.00	100.00	100.00
1916-17	Jun 1 Balance	100.00	100.00	100.00	100.00
1917-18	Jul 1 Balance	100.00	100.00	100.00	100.00
1918-19	Aug 1 Balance	100.00	100.00	100.00	100.00
1919-20	Sep 1 Balance	100.00	100.00	100.00	100.00
1920-21	Oct 1 Balance	100.00	100.00	100.00	100.00
1921-22	Nov 1 Balance	100.00	100.00	100.00	100.00
1922-23	Dec 1 Balance	100.00	100.00	100.00	100.00
1923-24	Jan 1 Balance	100.00	100.00	100.00	100.00
1924-25	Feb 1 Balance	100.00	100.00	100.00	100.00
1925-26	Mar 1 Balance	100.00	100.00	100.00	100.00
1926-27	Apr 1 Balance	100.00	100.00	100.00	100.00
1927-28	May 1 Balance	100.00	100.00	100.00	100.00
1928-29	Jun 1 Balance	100.00	100.00	100.00	100.00
1929-30	Jul 1 Balance	100.00	100.00	100.00	100.00
1930-31	Aug 1 Balance	100.00	100.00	100.00	100.00
1931-32	Sep 1 Balance	100.00	100.00	100.00	100.00
1932-33	Oct 1 Balance	100.00	100.00	100.00	100.00
1933-34	Nov 1 Balance	100.00	100.00	100.00	100.00
1934-35	Dec 1 Balance	100.00	100.00	100.00	100.00
1935-36	Jan 1 Balance	100.00	100.00	100.00	100.00
1936-37	Feb 1 Balance	100.00	100.00	100.00	100.00
1937-38	Mar 1 Balance	100.00	100.00	100.00	100.00
1938-39	Apr 1 Balance	100.00	100.00	100.00	100.00
1939-40	May 1 Balance	100.00	100.00	100.00	100.00
1940-41	Jun 1 Balance	100.00	100.00	100.00	100.00
1941-42	Jul 1 Balance	100.00	100.00	100.00	100.00
1942-43	Aug 1 Balance	100.00	100.00	100.00	100.00
1943-44	Sep 1 Balance	100.00	100.00	100.00	100.00
1944-45	Oct 1 Balance	100.00	100.00	100.00	100.00
1945-46	Nov 1 Balance	100.00	100.00	100.00	100.00
1946-47	Dec 1 Balance	100.00	100.00	100.00	100.00
1947-48	Jan 1 Balance	100.00	100.00	100.00	100.00
1948-49	Feb 1 Balance	100.00	100.00	100.00	100.00
1949-50	Mar 1 Balance	100.00	100.00	100.00	100.00
1950-51	Apr 1 Balance	100.00	100.00	100.00	100.00
1951-52	May 1 Balance	100.00	100.00	100.00	100.00
1952-53	Jun 1 Balance	100.00	100.00	100.00	100.00
1953-54	Jul 1 Balance	100.00	100.00	100.00	100.00
1954-55	Aug 1 Balance	100.00	100.00	100.00	100.00
1955-56	Sep 1 Balance	100.00	100.00	100.00	100.00
1956-57	Oct 1 Balance	100.00	100.00	100.00	100.00
1957-58	Nov 1 Balance	100.00	100.00	100.00	100.00
1958-59	Dec 1 Balance	100.00	100.00	100.00	100.00
1959-60	Jan 1 Balance	100.00	100.00	100.00	100.00
1960-61	Feb 1 Balance	100.00	100.00	100.00	100.00
1961-62	Mar 1 Balance	100.00	100.00	100.00	100.00
1962-63	Apr 1 Balance	100.00	100.00	100.00	100.00
1963-64	May 1 Balance	100.00	100.00	100.00	100.00
1964-65	Jun 1 Balance	100.00	100.00	100.00	100.00
1965-66	Jul 1 Balance	100.00	100.00	100.00	100.00
1966-67	Aug 1 Balance	100.00	100.00	100.00	100.00
1967-68	Sep 1 Balance	100.00	100.00	100.00	100.00
1968-69	Oct 1 Balance	100.00	100.00	100.00	100.00
1969-70	Nov 1 Balance	100.00	100.00	100.00	100.00
1970-71	Dec 1 Balance	100.00	100.00	100.00	100.00
1971-72	Jan 1 Balance	100.00	100.00	100.00	100.00
1972-73	Feb 1 Balance	100.00	100.00	100.00	100.00
1973-74	Mar 1 Balance	100.00	100.00	100.00	100.00
1974-75	Apr 1 Balance	100.00	100.00	100.00	100.00
1975-76	May 1 Balance	100.00	100.00	100.00	100.00
1976-77	Jun 1 Balance	100.00	100.00	100.00	100.00</

TABLE XVI

ANALYSIS OF 200 BOND ISSUES JULY 1, 1954 TO JULY 27, 1955

Issue	Building	Purpose Equipment	Site	Reserve	Callables	Surplus
1	Yes	Yes	No	Yes	Yes	1 Yr.
2	Yes	Yes	No-	Yes	Yes	5 Yr.
3	Yes	Yes	Yes	Yes	Yes	3 Yr.
4	Yes	Yes	Yes	Yes	Yes	2 Yr.
5	Yes	Yes	No	Yes	Yes	5 Yr.
6*	Yes	Yes	Yes	No	Yes	
7*	Yes	Yes	No	No	Yes	
8	Yes	Yes	Yes	Yes	Yes	2 Yr.
9	Yes	Yes	Yes	No	No	5 Yr.
10	Yes	Yes	Yes	Yes	Yes	4 Yr.
11	Yes	Yes	Yes	Yes	Yes	3 Yr.
12	Yes	Yes	No	No	No-	1 Yr.
13	Yes	Yes	Yes	Yes	Yes	2 Yr.
14	Yes	Yes	No	Yes	Yes	2 Yr.
15	Yes	Yes	Yes	Yes	Yes	2 Yr.
16	Yes	Yes	No	Yes	Yes	1 Yr.
17*	Yes	Yes	Yes	No	Yes	
18	Yes	Yes	Yes	Yes	Yes	2 Yr.
19	Yes	Yes	No	Yes	Yes	2 Yr.
20	Yes	Yes	Yes	Yes	Yes	2 Yr.
21	Yes	Yes	No	Yes	Yes	3 Yr.
22	Yes	Yes	No	Yes	Yes	3 Yr.
23	Yes	Yes	Yes	Yes	Yes	2 Yr.
24	Yes	Yes	No	Yes	Yes	3 Yr.
25	Yes	Yes	Yes	Yes	Yes	2 Yr.

TABLE XVI (Continued)

ANALYSIS OF 200 BOND ISSUES JULY 1, 1954 TO JULY 27, 1955

Issue	Building	Purpose Equipment	Site	Reserve	Callables	Surplus
26	Yes	Yes	No	Yes	Yes	2 Ir.
27	Yes	Yes	No	No	Yes	2 Ir.
28	Yes	Yes	Yes	Yes	Yes	2 Ir.
29	Yes	Yes	No	Yes	Yes	6 Ir.
30	Yes	Yes	Yes	Yes	Yes	1 Ir.
31	Yes	Yes	No	Yes	Yes	4 Ir.
32	Yes	Yes	No	Yes	Yes	2 Ir.
33	Yes	Yes	No	Yes	Yes	5 Ir.
34	Yes	No	No	Yes	Yes	1 Ir.
35	Yes	No	Yes	Yes	Yes	2 Ir.
36	Yes	Yes	No	Yes	Yes	2 Ir.
37	Yes	Yes	No	Yes	Yes	3 Ir.
38	Yes	Yes	No	Yes	Yes	2 Ir.
39	Yes	Yes	No	Yes	Yes	3 Ir.
40	Yes	Yes	No	Yes	Yes	2 Ir.
41	Yes	Yes	No	Yes	Yes	2 Ir.
42	Yes	Yes	No	Yes	Yes	2 Ir.
43	Yes	Yes	No	Yes	Yes	2 Ir.
44	Yes	Yes	No	Yes	Yes	4 Ir.
45	Yes	Yes	No	Yes	Yes	2 Ir.
46	Yes	Yes	No	Yes	Yes	2 Ir.
47	Yes	Yes	Yes	Yes	Yes	2 Ir.
48	Yes	Yes	No	No	Yes	3 Ir.
49	Yes	Yes	No	Yes	Yes	3 Ir.
50	Yes	Yes	No	Yes	Yes	3 Ir.

TABLE XVI (Continued)

ANALYSIS OF 200 BOND ISSUES JULY 1, 1954 TO JULY 27, 1955

Issue	Building	Purpose Equipment	Site	Reserve	Callables	Surplus
51	Yes	Yes	Yes	No	No	1 Yr.
52	Yes	Yes	No	Yes	Yes	2 Yr.
53	Yes	Yes	Yes	Yes	Yes	1 Yr.
54	Yes	Yes	No	Yes	Yes	
55	Yes	Yes	No	Yes	Yes	
56	Yes	No	Yes	Yes	Yes	3 Yr.
57	Yes	Yes	No	Yes	Yes	2 Yr.
58	Yes	Yes	Yes	Yes	Yes	2 Yr.
59	Yes	Yes	No	Yes	Yes	2 Yr.
60	Yes	Yes	No	Yes	Yes	3 Yr.
61	Yes	Yes	Yes	Yes	Yes	3 Yr.
62	Yes	Yes	No	Yes	Yes	2 Yr.
63	Yes	Yes	Yes	Yes	Yes	2 Yr.
64	Yes	Yes	No	Yes	Yes	5 Yr.
65	Yes	Yes	No	Yes	Yes	2 Yr.
66	Yes	Yes	No	Yes	Yes	3 Yr.
67	Yes	Yes	Yes	No	Yes	
68	Yes	Yes	Yes	Yes	Yes	2 Yr.
69	Yes	Yes	No	Yes	Yes	2 Yr.
70	Yes	Yes	Yes	Yes	Yes	4 Yr.
71	Yes	Yes	No	Yes	Yes	3 Yr.
72	Yes	Yes	Yes	Yes	Yes	2 Yr.
73	Yes	Yes	No	Yes	Yes	2 Yr.
74	Yes	No	Yes	Yes	Yes	
75	Yes	Yes	No	Yes	Yes	2 Yr.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 104

[illegible]

1. *Chlorophyll a* and *Chlorophyll b* were determined by the method of Arar and Collins (1971) using a Shimadzu 1601 UV-Visible Spectrophotometer. The concentration of chlorophyll was expressed in $\mu\text{g mL}^{-1}$.

TABLE XVI (Continued)

ANALYSIS OF 200 BOND ISSUES JULY 1, 1954 TO JULY 27, 1955

Issue	Building	Purpose Equipment	Site	Reserve	Callables	Surplus
76	Yes	Yes	No	Yes	Yes	2 Yr.
77	Yes	Yes	Yes	Yes	Yes	3 Yr.
78	Yes	Yes	Yes	Yes	Yes	2 Yr.
79	Yes	Yes	Yes	Yes	Yes	2 Yr.
80	Yes	Yes	Yes	Yes	Yes	2 Yr.
81	Yes	Yes	Yes	Yes	Yes	2 Yr.
82	Yes	Yes	No	Yes	Yes	5 Yr.
83	Yes	Yes	Yes	Yes	Yes	3 Yr.
84	Yes	Yes	No	Yes	Yes	2 Yr.
85	Yes	Yes	No	Yes	Yes	3 Yr.
86	Yes	Yes	No	Yes	Yes	2 Yr.
87	Yes	Yes	Yes	Yes	Yes	2 Yr.
88	Yes	Yes	Yes	Yes	Yes	5 Yr.
89	Yes	Yes	No	Yes	Yes	1 Yr.
90	Yes	Yes	Yes	Yes	Yes	2 Yr.
91	Yes	Yes	Yes	Yes	Yes	2 Yr..
92	Yes	Yes	No	Yes	Yes	2 Yr.
93	Yes	Yes	No	Yes	Yes	2 Yr.
94	Yes	Yes	No	Yes	Yes	3 Yr.
95	Yes	Yes	No	Yes	Yes	2 Yr.
96	Yes	Yes	No	Yes	Yes	1 Yr.
97	Yes	Yes	No	Yes	Yes	1 Yr.
98	Yes	Yes	No	Yes	Yes	2 Yr..
99	Yes	Yes	Yes	No	Yes	4 Yr.
100	Yes	Yes	No	No	Yes	2 Yr.

TABLE XVI (Continued)

ANALYSIS OF 200 BOND ISSUES JULY 1, 1954 TO JULY 27, 1955

Issue	Building	Purpose Equipment	Site	Reserve	Callables	Surplus
101	Yes	Yes	No	Yes	Yes	2 Yr.
102	Yes	Yes	Yes	Yes	Yes	3 Yr.
103	Yes	Yes	No	Yes	Yes	1 Yr.
104	Yes	No	No	No	Yes	3 Yr.
105	Yes	No	No	Yes	Yes	2 Yr.
106	Yes	Yes	No	Yes	Yes	1 Yr.
107	Yes	No	No	Yes	Yes	2 Yr.
108	Yes	Yes	Yes	Yes	Yes	2 Yr.
109	Yes	Yes	Yes	Yes	Yes	3 Yr.
110	Yes	Yes	No	Yes	Yes	1 Yr.
111	Yes	No	Yes	Yes	Yes	10 Yr.
112	Yes	Yes	No	Yes	Yes	2 Yr.
113	Yes	No	Yes	Yes	Yes	5 Yr.
114	Yes	Yes	No	Yes	Yes	6 Yr.
115	Yes	Yes	No	Yes	Yes	3 Yr.
116	Yes	Yes	Yes	Yes	Yes	2 Yr.
117	Yes	Yes	Yes	Yes	Yes	1 Yr.
118	Yes	Yes	No	Yes	Yes	1 Yr.
119	Yes	No	No	Yes	Yes	3 Yr.
120	Yes	Yes	No	Yes	Yes	2 Yr.
121	Yes	Yes	No	Yes	Yes	2 Yr.
122	Yes	Yes	Yes	Yes	Yes	2 Yr.
123	Yes	Yes	Yes	Yes	Yes	2 Yr.
124	Yes	Yes	Yes	Yes	Yes	3 Yr.
125	Yes	Yes	Yes	Yes	Yes	2 Yr.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	12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TABLE XVI (Continued)

ANALYSIS OF 200 BOND ISSUES JULY 1, 1954 TO JULY 27, 1955

Issues	Building	Purpose Equipment	Site	Reserve	Callables	Surplus
126	Yes	No	No	Yes	Yes	2 Yr.
127	Yes	Yes	Yes	Yes	Yes	3 Yr.
128	Yes	Yes	No	Yes	Yes	
129	Yes	Yes	Yes	Yes	Yes	2 Yr.
130	Yes	Yes	Yes	Yes	Yes	3 Yr.
131	Yes	Yes	No	Yes	Yes	2 Yr.
132	Yes	Yes	No	Yes	Yes	2 Yr.
133	Yes	Yes	Yes	Yes	Yes	1 Yr.
134	Yes	Yes	No	Yes	Yes	5 Yr.
135	Yes	Yes	No	Yes	Yes	2 Yr.
136	Yes	Yes	No	Yes	Yes	4 Yr.
137	Yes	Yes	No	Yes	Yes	3 Yr.
138	Yes	Yes	Yes	Yes	Yes	4 Yr.
139	Yes	Yes	No	Yes	Yes	
140	Yes	Yes	No	Yes	Yes	1 Yr.
141	Yes	Yes	No	Yes	Yes	1 Yr.
142	Yes	Yes	No	Yes	Yes	1 Yr.
143	Yes	Yes	Yes	Yes	Yes	2 Yr.
144	Yes	Yes	No	Yes	Yes	4 Yr.
145	Yes	No	Yes	Yes	Yes	5 Yr.
146	Yes	No	No	Yes	Yes	
147	Yes	Yes	Yes	Yes	Yes	2 Yr.
148	Yes	Yes	Yes	Yes	Yes	4 Yr.
149	Yes	Yes	No	Yes	Yes	3 Yr.
150	Yes	Yes	No	Yes	Yes	3 Yr.

TABLE XVI (Continued)
ANALYSIS OF 200 BOND ISSUES JULY 1, 1954 TO JULY 27, 1955

Issue	Building	Purpose Equipment	Site	Reserve	Callables	Surplus
151	Yes	No	Yes	Yes	Yes	2 Yr.
152	Yes	Yes	Yes	Yes	Yes	2 Yr.
153	Yes	No	Yes	Yes	Yes	2 Yr.
154	Yes	No	Yes	Yes	Yes	2 Yr.
155	Yes	Yes	No	Yes	Yes	
156	Yes	Yes	Yes	Yes	Yes	3 Yr.
157	Yes	Yes	No	Yes	Yes	2 Yr.
158	Yes	Yes	No	Yes	Yes	2 Yr.
159	Yes	Yes	No	Yes	Yes	
160	Yes	Yes	No	Yes	Yes	5 Yr.
161	Yes	Yes	No	Yes	Yes	3 Yr.
162	Yes	Yes	No	Yes	Yes	
163	Yes	No	No	Yes	Yes	3 Yr.
164	Yes	Yes	No	Yes	Yes	3 Yr.
165	Yes	Yes	No	Yes	Yes	7 Yr.
166	Yes	Yes	Yes	Yes	Yes	5 Yr.
167	Yes	Yes	No	Yes	Yes	2 Yr.
168	Yes	No	No	Yes	Yes	2 Yr.
169	Yes	Yes	No	Yes	Yes	2 Yr.
170	Yes	Yes	No	Yes	Yes	4 Yr.
171	Yes	Yes	No	Yes	Yes	2 Yr.
172	Yes	Yes	Yes	Yes	Yes	3 Yr.
173	Yes	Yes	No	Yes	Yes	4 Yr.
174	Yes	Yes	No	Yes	Yes	2 Yr.
175	Yes	Yes	No	Yes	Yes	2 Yr.

TABLE XVI (Continued)

ANALYSIS OF 200 BOND ISSUES JULY 1, 1954 TO JULY 27, 1955

Issue	Building	Purpose Equipment	Site	Reserve	Callables	Surplus
176	Yes	Yes	Yes	Yes	Yes	2 Yr.
177	Yes	Yes	No	Yes	Yes	2 Yr.
178	Yes	Yes	Yes	Yes	Yes	4 Yr.
179	Yes	Yes	No	Yes	Yes	2 Yr.
180	Yes	Yes	No	Yes	Yes	3 Yr.
181	Yes	Yes	No	Yes	Yes	3 Yr.
182	Yes	Yes	No	Yes	Yes	2 Yr.
183	Yes	Yes	No	Yes	Yes	2 Yr.
184	Yes	Yes	Yes	Yes	Yes	2 Yr.
185	Yes	Yes	No	Yes	Yes	4 Yr.
186	Yes	Yes	No	Yes	Yes	3 Yr.
187	Yes	Yes	No	Yes	Yes	2 Yr.
188	Yes	Yes	No	Yes	Yes	2 Yr.
189	Yes	Yes	Yes	Yes	Yes	3 Yr.
190	Yes	Yes	Yes	Yes	Yes	2 Yr.
191	Yes	Yes	No	Yes	Yes	2 Yr.
192	Yes	Yes	No	Yes	Yes	2 Yr.
193	Yes	Yes	Yes	Yes	Yes	3 Yr.
194	Yes	Yes	No	Yes	Yes	2 Yr.
195	Yes	Yes	No	Yes	Yes	2 Yr.
196	Yes	Yes	No	Yes	Yes	2 Yr.
197	Yes	Yes	No	Yes	Yes	2 Yr.
198	Yes	Yes	No	Yes	Yes	1 Yr.
199*	Yes	Yes	No	Yes	Yes	3 Yr.
200*	Yes	Yes	No	No	Yes	5 Yr.

* Qualified.

[illegible][illegible]

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1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 104

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TABLE XVII
ANALYSIS OF 200 ISSUES JULY 1, 1954 TO JULY 27, 1955

Issue	Minimum millage tax levy	Minimum dollar tax levy	Amount bond in dollars	Issue	Minimum millage tax levy	Minimum dollar tax levy	Amount bond in dollars
1	Yes	No	1,000	21	No	Yes	1,000
2	Yes	No	1,000	22	No	Yes	1,000
3	Yes	No	1,000	23	No	Yes	1,000-500
4	No	Yes	1,000	24	Yes	Yes	1,000
5	Yes	No	1,000	25	No	Yes	1,000
6*	No	No	1,000	26	No	Yes	1,000
7*	No	No	1,000	27	No	Yes	1,000
8	No	Yes	1,000	28	No	Yes	1,000
9	No	No	1,000	29	Yes	Yes	1,000
10	No	Yes	1,000	30	Yes	Yes	1,000
11	No	Yes	1,000	31	Yes	Yes	1,000
12	No	Yes	1,000	32	No	Yes	1,000
13	No	Yes	1,000	33	Yes	Yes	1,000
14	No	Yes	1,000	34	Yes	Yes	1,000
15	Yes	Yes	1,000	35	Yes	Yes	1,000
16	Yes	Yes	1,000	36	No	Yes	1,000
17*	No	No	1,000	37	Yes	Yes	1,000
18	Yes	Yes	1,000	38	No	Yes	1,000
19	No	Yes	1,000	39	Yes	Yes	1,000
20	No	Yes	1,000	40	No	Yes	1,000

* Unlimited tax bonds.

TABLE XVII (Continued)

ANALYSIS OF 200 ISSUES JULY 1, 1954 TO JULY 27, 1955

Issue	Minimum millage tax levy	Minimum dollar tax levy	Amount bond in dollars	Issue	Minimum millage tax levy	Minimum dollar tax levy	Amount bond in dollars
41	No	Yes	1,000	61	No	Yes	1,000
42	No	Yes	1,000	62	Yes	Yes	1,000
43	No	Yes	1,000	63	Yes	Yes	1,000
44	Yes	Yes	1,000	64	Yes	Yes	1,000
45	No	Yes	1,000	65	No	Yes	1,000
46	No	Yes	1,000	66	Yes	Yes	1,000
47	No	Yes	1,000	67	No	Yes	1,000
48	Yes	Yes	5,000	68	Yes	Yes	1,000
49	No	Yes	1,000	69	No	Yes	1,000
50	Yes	Yes	1,000	70	Yes	No	1,000
51	No	Yes	1,000	71	No	Yes	1,000
52	No	Yes	1,000	72	No	Yes	1,000
53	No	Yes	1,000	73	No	Yes	1,000
54	No	Yes	1,000	74	Yes	No	1,000
55	No	Yes	1,000	75	No	Yes	1,000
56	Yes	Yes	1,000	76	No	Yes	1,000
57	No	Yes	1,000	77	Yes	No	1,000
58	No	Yes	1,000	78	No	Yes	1,000
59	No	Yes	1,000	79	No	Yes	1,000
60	Yes	Yes	1,000	80	No	Yes	1,000

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the 1990s, the number of people in the world who are under 15 years of age is expected to increase from 1.1 billion to 1.5 billion. The number of people aged 65 and over is expected to increase from 250 million to 450 million. The number of people aged 15 and over is expected to increase from 3.5 billion to 4.5 billion. The number of people aged 15 and over is expected to increase from 3.5 billion to 4.5 billion. The number of people aged 15 and over is expected to increase from 3.5 billion to 4.5 billion.

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10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1

1. *Chlorophyll a* and *Chlorophyll b* were determined by the method of Arar and Collins (1971). The concentration of chlorophylls was expressed as $\mu\text{g mL}^{-1}$ of the sample.

1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 26

TABLE XVII (Continued)
ANALYSIS OF 200 ISSUES JULY 1, 1954 TO JULY 27, 1955

Issue	Minimum millage tax levy	Minimum dollar tax levy	Amount bond in dollars	Issue	Minimum millage tax levy	Minimum dollar tax levy	Amount bond in dollars
81	No	Yes	1,000	101	No	Yes	1,000
82	No	Yes	1,000	102	Yes	No	1,000
83	Yes	Yes	1,000	103	No	Yes	1,000
84	No	Yes	1,000	104	No	Yes	1,000
85	Yes	Yes	1,000	105	No	Yes	500
86	No	Yes	1,000	106	No	Yes	1,000
87	No	Yes	1,000	107	No	Yes	1,000
88	Yes	Yes	1,000	108	No	Yes	1,000
89	No	Yes	1,000	109	Yes	Yes	1,000
90	No	Yes	1,000	110	No	Yes	1,000
91	No	Yes	1,000	111	Yes	No	1,000
92	No	Yes	1,000	112	No	Yes	1,000
93	Yes	Yes	1,000	113	No	Yes	1,000
94	Yes	Yes	1,000	114	Yes	Yes	1,000
95	No	Yes	1,000	115	Yes	Yes	1,000
96	No	Yes	1,000	116	Yes	Yes	1,000
97	No	Yes	1,000	117	Yes	No	1,000
98	No	Yes	1,000	118	No	Yes	1,000-500
99	No	No	1,000	119	No	Yes	1,000
100	No	Yes	1,000	120	No	Yes	1,000

TABLE XVII (Continued)
ANALYSIS OF 200 ISSUES JULY 1, 1954 TO JULY 27, 1955

Issue	Minimum millage tax levy	Minimum dollar tax levy	Amount bond in dollars	Issue	Minimum millage tax levy	Minimum dollar tax levy	Amount bond in dollars
121	No	Yes	1,000	141	No	Yes	1,000
122	No	Yes	1,000-500	142	Yes	Yes	1,000
123	No	Yes	1,000-500	143	Yes	No	1,000
124	No	Yes	1,000	144	Yes	Yes	1,000
125	Yes	No	1,000	145	Yes	Yes	1,000
126	Yes	Yes	1,000	146	No	Yes	500
127	Yes	Yes	1,000	147	Yes	Yes	1,000
128	Yes	Yes	1,000	148	Yes	No	1,000
129	No	Yes	1,000	149	Yes	Yes	1,000
130	No	No	1,000	150	Yes	Yes	1,000
131	No	Yes	1,000	151	No	Yes	1,000
132	No	Yes	1,000	152	No	Yes	1,000
133	No	Yes	1,000	153	No	Yes	1,000
134	No	Yes	1,000	154	No	Yes	1,000
135	No	Yes	1,000	155	No	Yes	500
136	Yes	Yes	1,000	156	Yes	Yes	1,000
137	No	Yes	1,000	157	No	Yes	1,000
138	Yes	Yes	1,000	158	Yes	No	1,000
139	No	Yes	1,000	159	Yes	No	1,000
140	Yes	Yes	1,000	160	No	Yes	1,000

[illegible]

TABLE XVII (Continued)
ANALYSIS OF 200 ISSUES JULY 1, 1954 TO JULY 27, 1955

Issue	Minimum millage tax levy	Minimum dollar tax levy	Amount bond in dollars	Issue	Minimum millage tax levy	Minimum dollar tax levy	Amount bond in dollars
161	No	Yes	1,000	181	Yes	Yes	1,000
162	No	Yes	1,000	182	No	Yes	1,000
163	Yes	Yes	500	183	No	Yes	1,000
164	No	Yes	1,000-500	184	No	Yes	1,000
165	No	Yes	1,000	185	Yes	Yes	1,000
166	Yes	Yes	1,000	186	Yes	Yes	1,000
167	No	Yes	1,000	187	No	Yes	1,000
168	No	Yes	1,000	188	No	Yes	1,000
169	No	Yes	1,000	189	No	Yes	1,000
170	No	Yes	1,000	190	Yes	Yes	1,000
171	Yes	No	1,000	191	No	Yes	1,000
172	Yes	Yes	1,000	192	Yes	Yes	1,000
173	Yes	Yes	1,000	193	Yes	Yes	1,000
174	No	Yes	1,000	194	No	Yes	1,000
175	No	Yes	1,000	195	No	Yes	1,000-500
176	No	Yes	1,000	196	No	Yes	1,000
177	No	Yes	1,000-500	197	Yes	Yes	1,000
178	No	Yes	1,000	198	Yes	Yes	1,000
179	No	Yes	1,000	199	Yes	Yes	1,000
180	Yes	Yes	1,000	200	Yes	Yes	1,000

TABLE XVIII

CHART SHOWING % OF AFFIRMATIVE VOTE
INTERESTED PARTIES, BIDDERS AND INTEREST RATE

[illegible]

TABLE XVIII (Continued)

CHART SHOWING % OF AFFIRMATIVE VOTE
INTERESTED PARTIES, BIDDERS AND INTEREST RATE

	89%	88%	87%	86%	85%	84%	83%	82%	81%	80%
* N.I.C.	3-3 3.10	9-4 3.12	10-5 2.78	3-1 3.24	7-6 2.97	2-1 3.00	2-1 3.85	5-5 2.72	2-2 3.11	6-3 2.69
* N.I.C.	13-4 3.00	1-1 2.91	1-1 2.61	1-1 3.00		14-6 2.44	12-1 3.00	5-6 2.43	2-2 2.10	
* N.I.C.	7-7 2.47	4-3 2.87	14-6 2.46	3-3 2.92		7-5 2.34	10-4 2.35			
* N.I.C.	8-7 2.40	1-1 1.65	7-6 2.49	12-4 2.41			4-4 2.35			
* N.I.C.	11-6 2.27		25-2 2.13	11-5 2.15			4-4 2.22			
* N.I.C.				14-4 2.06			7-4 2.14			
* N.I.C.							10-4 2.09			
* N.I.C.							5-5 1.74			

[illegible]

TABLE XVIII (Continued)

CHART SHOWING % OF AFFIRMATIVE VOTE
INTERESTED PARTIES, BIDDERS AND INTEREST RATE

[illegible]

TABLE XVIII (Continued)

[illegible]

THE UNIVERSITY OF CHICAGO

THE NATIONAL ARCHIVES
COLLEGE PARK, MARYLAND 20740

[illegible]

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TABLE XVIII (Continued)

CHART SHOWING % OF AFFIRMATIVE VOTE
INTERESTED PARTIES, BIDDERS AND INTEREST RATES

	59%	58%	57%	56%	55%	53%	52%	51%	50%
* N.I.C.	18-3 2.64	4-4 3.09	30-3 2.65	43-3 2.23	7-4 2.57	11-2 3.06	3-2 2.94	4-2 2.51	2-2 2.91
* N.I.C.	6-3 2.46		5-5 2.11	2-2 1.61	18-3 2.53		8-6 2.41	8-4 2.49	20-3 2.53
* N.I.C.	10-4 2.27						12-9 1.69	12-5 2.35	
* N.I.C.								11-5 2.17	
* N.I.C.									
* N.I.C.									

* First figure represents number of interested companies involved in submitted bids.
Second figure represents number of bids submitted.
N.I.C. Represents net interest cost of the issue to closest hundredth.

TABLE XXIV

UNLIMITED TAX BONDS QUALIFIED & NOT QUALIFIED -- SOLD BUT NOT DELIVERED
PENDING SUPREME COURT DECISION

Date	District	Amount not delivered	Date	District	Amount not delivered
3/11/57	Avondale	850,000	11/1/56	Howard	150,000
4/8/57	Berkley	750,000	3/25/57	Hudsonville	350,000
3/19/57	Birmingham	1,500,000*	4/19/57	Michigan Center	1,000,000
3/28/57	Clarkston	150,000	4/16/57	Pinconning	1,240,000
4/9/57	Clawson	250,000	4/8/57	Port Hope	240,000*
4/4/57	Clintondale	810,000	3/11/57	Raber # 9	100,000
4/18/57	Forest # 6	275,000	4/11/57	Sand Creek	575,000
4/4/57	Gladstone	420,000	4/23/57	Teckonsha	345,000
4/17/57	Haslett	850,000	4/2/57	Townline	125,000
4/2/57	Hazel Park	1,500,000	3/12/57	Trout Lake # 5	40,000
3/5/57	Hopkins	250,000	3/27/57	Whiteford R.A.	725,000
4/3/57	Whitemore Lake	275,000			

* Not Qualified.

TABLE XIV

BONDS MARKETED - DEBT IN EXCESS OF 15% OF VALUATION
COULD NOT LEGALLY HAVE BEEN SOLD PRIOR TO 1955 LEGISLATION

Date sale		Amount	Valuation date of	% All net debt	Avg. Int. cost
12/13/55	Holt Pub Sch., Ingham	1,525,000	6,556,886	27.31	4.04
1/23/56	Frazer, Macomb	1,300,000	5,556,402	25.79	3.7796
1/31/56	Kimball, St. Clair	346,000	3,930,005	15.09	3.3090
2/13/56	Nankin # 1, Wayne	350,000	715,964	48.89	4.1145
3/6/56	Spring Arbor # 1, Jackson	125,000	559,533	22.34	3.6036
3/27/56	Clinton Valley, Macomb	550,000	2,442,562	27.68	3.7089
4/9/56	Berrien # 37, Berrien	125,000	710,035	17.60	3.507
4/12/56	Garden City, Wayne	3,300,000	24,815,642	21.23	3.9965
4/18/56	Dearborn # 7, Wayne	2,200,000	7,453,477	34.29	3.99
5/9/56	Romulus, Wayne	1,300,000	14,803,722	17.09	3.7141
5/28/56	Fenton Area, Genesee	1,400,000	8,808,250	15.89	3.3389
6/21/56	Royal Oak # 4, Oakland	2,000,000	15,241,996	19.87	4.1385
6/21/56	Harper Creek, Calhoun	1,270,000	10,166,000	15.09	3.4179

TABLE XIV (Continued)

BONDS MARKETED - DEBT IN EXCESS OF 15% OF VALUATION
COULD NOT LEGALLY HAVE BEEN SOLD PRIOR TO 1955 LEGISLATION

Date sale		Amount	Valuation date of	% All net debt	Avg. Int. cost
6/27/56	Shields, Saginaw	490,000	1,547,775	37.81	4.0946
8/13/56	Carr # 6, Muskegon	340,000	1,449,474	23.46	4.696
8/13/56	Cass # 6, Cass	110,000	449,946	24.45	4.25
8/21/56	Holton, Muskegon	130,000	717,525	18.12	4.2814
9/12/56	Woodhull # 4, Shiawassee	70,000	443,039	15.78	4.49
10/24/56	Barr Oak, Kent	165,000	1,034,631	15.95	4.3097
10/31/56	Cooper, Wayne	500,000	5,543,956	15.35	4.3499
11/8/56	Reese, Tuscola	580,000	3,539,666	17.09	4.2781
11/13/56	Bannon # 36, Saginaw	100,000	826,884	20.62	4.80
11/14/56	Wright # 24, Ottawa	165,000	1,118,610	16.00	4.464
12/3/56	Sanford, Midland	200,000	1,439,056	15.22	4.577
12/17/56	L'Anse Creuse, Mackinac	2,000,000	17,059,268	18.46	4.7951

1. The first part of the report is a general introduction to the subject of the study. It discusses the importance of the problem and the objectives of the research.	2. The second part of the report is a detailed description of the methods used in the study. It includes a description of the experimental design, the subjects, and the procedures.	3. The third part of the report is a presentation of the results of the study. It includes a description of the data and the statistical analysis.	4. The fourth part of the report is a discussion of the results and their implications. It discusses the strengths and limitations of the study and suggests directions for future research.	5. The fifth part of the report is a conclusion. It summarizes the main findings of the study and provides a final statement on the importance of the research.
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The first part of the report is a general introduction to the subject of the study. It discusses the importance of the problem and the objectives of the research.

The second part of the report is a detailed description of the methods used in the study. It includes a description of the experimental design, the subjects, and the procedures.

TABLE XXVI

MICHIGAN SCHOOL BONDS MARKETING JANUARY 1, 1955 to JANUARY 1, 1957
JANUARY 1, 1955 to JULY 1, 1955

Date of sale	Amount of issue	District	Average interest cost	Type of bond
5/18/55	75,000	Albee Twp # 3 Sag. Co.	2.5537	LTD.
4/5/55	170,000	Allendale Twp # 1 Ottowa Co.	2.5681	LTD.
1/27/55	285,000	Almont Twp # 1 Lapeer Co.	2.34472	LTD.
3/21/55	50,000	Alpine & Walker # 13 Kent Co.	2.975	LTD.
5/25/55	800,000	Anchor Bay, Mac & St. Clair	2.6109	LTD.
1/12/55	220,000	Arenac # 1 Arenac # 1 Co.	2.85	LTD.
4/26/55	600,000	Armada # 2 Mac & St. Clair Co.	2.30623	LTD.
6/27/55	300,000	Augusta # 1 Washtenaw Co.	3.2589	LTD.
4/25/55	500,000	Bangor Twp Bay Co.	1.7492	LTD.
4/28/55	80,000	Benoma Com. Sch. Oceana Co.	2.686	LTD.
6/13/55	25,000	Berrien Twp # 11 Berrien Co.	2.62	LTD.
6/9/55	35,000	Bertrand Twp # 6 Berrien Co.	2.6576	LTD.
6/2/55	100,000	Brownstown # 3 Wayne Co.	2.745	LTD.
1/7/55	200,000	Burton # 9 Fr. Genesee Co.	2.036	LTD.
4/7/55	200,000	Caseville Twp # 1 Huron Co.	2.4895	LTD.
3/28/55	50,000	Cherry Beach # 2 St. Clair Co.	2.7146	LTD.
5/12/55	325,000	Corunna Shiawassee Co.	2.4587	LTD.
3/17/55	200,000	Deerfield Pub. Len. & Mon. Co.	2.67631	LTD.
5/19/55	125,000	Deford Sch Tuscola	2.4881	LTD.
4/14/55	150,000	Delta # 10 Eaton Co.	2.4581	LTD.
1/6/55	445,000	Dundee Monroe Co.	2.2330	LTD.
5/3/55	250,000	Durand Shiawassee Co.	2.44	LTD.

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TABLE XXVI (continued)

MICHIGAN SCHOOL BONDS MARKETED JANUARY 1, 1955 to JANUARY 1, 1957
JANUARY 1, 1955 to JULY 1, 1955

Date of sale	Amount of issue	District	Average interest cost	Type of bond
1/4/55	135,000	Eggelston Twp # 4 Muskegon Co.	2.665	LTD.
5/10/55	40,000	Elk Twp, Sanilac Co.	2.1037	LTD.
4/12/55	38,000	Essex Twp, Clinton & Gratiot Co.	2.3449	LTD.
5/24/55	25,000	Eureka # 4 Frl., Montcalm Co.	2.60986	LTD.
3/1/55	70,000	Fruitland & Dalton # 1 Muskegon Co.	3.934	LTD.
2/14/55	60,000	Georgetown # 11, Ottawa Co.	2.1875	LTD.
4/12/55	105,000	Grand Rapids, Kent Co.	2.3396	LTD.
4/19/55	50,000	Grattan & Plainfield, Kent Co.	2.65176	LTD.
6/9/55	50,000	Greenbush # 9 Clinton Co.	2.303	LTD.
1/20/55	125,000	Harbor Springs Emmet Co.	1.597	LTD.
5/17/55	24,000	Hastings # 5 Frl Barry Co.	2.1103	LTD.
4/6/55	68,000	Henrietta # 14 Frl. Jackson Co.	2.589	LTD.
3/14/55	125,000	Holland Twp # 3 Ottawa Co.	2.4123	LTD.
1/19/55	90,000	Holland # 4 Ottawa Co.	2.477	LTD.
1/12/55	185,000	Honor, Benzie Co.	2.717	LTD.
5/24/55	300,000	Huron Twp, Wayne Co.	2.462	LTD.
6/9/55	1,250,000	Huron Valley, Oakland & Liv Co.	2.637	LTD.
4/6/55	65,000	James Couzens, Clinton & Shiaw Co.	2.3979	LTD.
3/29/55	45,000	Kalamazoo & Oshtemo # 9 Kalamazoo Co.	2.5725	LTD.
1/26/55	460,000	Lakeland # 1 Branch Co.	2.4172	LTD.



TABLE XXVI (continued)

MICHIGAN SCHOOL BONDS MARKETING JANUARY 1, 1955 to JANUARY 1, 1957
JANUARY 1, 1955 to JULY 1, 1955

Date of sale	Amount of issue	District	Average interest cost	Type of bond
1/12/55	350,000	Lakeview, Calhoun Co.	1.4932	LTD.
5/11/55	170,000	Lansing & Delta Ingham & Eaton Co.	2.4744	LTD.
6/15/55	250,000	Leslie, Ingham & Jackson Co.	2.5588	LTD.
5/12/55	500,000	Lincoln Park, Wayne Co.	2.53049	LTD.
4/28/55	295,000	Linden, Genesee & Liv. Co.	2.270	LTD.
3/24/55	15,000	Long Lake Sch # 3 Grand Traverse Co.	3.00	LTD.
1/5/55	220,000	Mendon Sch, St. Joseph Co.	2.21	LTD.
5/31/55	55,000	Menominee Twp # 8 Menominee Co.	2.8676	LTD.
4/19/55	53,000	Monitor # 2 Bay Co.	2.42	LTD.
1/20/55	168,000	Monitor # 4, Bay Co.	2.59	LTD.
3/23/55	130,000	Montrose, Genesee & Sag. Co.	2.3953	LTD.
1/13/55	1,500,000	Mt. Pleasant Isabella Co.	2.1777	LTD.
2/15/55	200,000	Novi # 8 Oakland Co.	2.42883	LTD.
1/5/55	525,000	Okemos Consol Sch Ingham Co.	2.0649	LTD.
2/2/55	300,000	Old Mission, Grand Traverse Co.	2.594	LTD.
3/9/55	475,000	Onsted, Lenawee Co.	2.65026	LTD.
2/2/55	38,000	Paris Twp # 4, Kent Co.	2.72	LTD.
6/14/55	120,000	Park Twp # 3, Ottawa Co.	2.5111	LTD.
4/18/55	175,000	Park 4 Frl, Ottawa Co.	2.1444	LTD.
4/13/55	40,000	Park, 8 Frl, Ottawa Co.	2.0928	LTD.

TABLE XXVI (continued)

MICHIGAN SCHOOL BONDS MARKETING JANUARY 1, 1955 to JANUARY 1, 1957
JANUARY 1, 1955 to JULY 1, 1955

Date of sale	Amount of issue	District	Average interest cost	Type of bond
2/3/55	250,000	Pinckney Comm Liv. & Washtenaw Co.	2.60	LTD.
1/12/55	2,100,000	Pontiac, Oakland Co.	1.611801	LTD.
3/1/55	2,250,000	Redford Twp, Wayne Co.	2.65097	LTD.
1/12/55	50,000	Remus, Mecosta & Isabella Co.	1.743	LTD.
4/28/55	600,000	Union Sch, Presque Isle Co.	2.4730	LTD.
3/24/55	100,000	Ross, # 9 Frl Kalamazoo Co.	2.3308	LTD.
6/29/55	2,000,000	Royal Oak, Oakland Co.	2.1125	ULTD.
2/24/55	350,000	Saginaw # 6, Saginaw Co.	2.648	LTD.
4/28/55	80,000	St. Charles # 1, Saginaw Co.	2.49	LTD.
2/28/55	250,000	St. Clair Shores # 1, Macomb Co.	2.9934	LTD.
3/31/55	40,000	Sparta Twp # 3, Kent Co.	2.529	LTD.
2/1/55	40,000	Spaulding Twp # 2, Saginaw Co.	3.1946	LTD.
2/10/55	665,000	Stockbridge, Ingham Co.	2.5233	LTD.
1/25/55	14,000	Sullivan, Fruitport # 4 Musk & Ott. Co.	3.17	LTD.
6/23/55	200,000	Sumpter, Wayne & Monroe Co.	3.8252	LTD.
2/16/55	20,000	Taymouth Twp # 8, Saginaw Co.	3.5725	LTD.
2/2/55	75,000	Thomas James # 4 Saginaw Co.	2.96799	LTD.
1/19/55	310,000	Three Rivers, St. Joseph Co.	2.111886	LTD.
6/22/55	250,000	Tittabawassee Twp, Saginaw Co.	2.621	LTD.
1/11/55	4,500,000	Trenton Public, Wayne Co.	2.13017	LTD.
4/11/55	55,000	Tyrone Twp # 4, Kent Co.	2.469	LTD.

TABLE XXVI (continued)

MICHIGAN SCHOOL BONDS MARKETING JANUARY 1, 1955 to JANUARY 1, 1957
 JANUARY 1, 1955 to JULY 1, 1955

Date of sale	Amount of issue	District	Average interest cost	Type of bond
5/18/55	62,000	Vernon & Shiawassee Twp Shia. Co.	2.4855	LTD.
4/27/55	65,000	Victory Twp Unit, Mason Co.	2.43	LTD.
4/13/55	50,000	Voliva, Wayne, Penn, Cass & Van Bur Co.	2.67	LTD.
6/14/55	60,000	Walker Twp # 11, Kent Co.	2.22	LTD.
1/24/55	550,000	Walled Lake, Oakland Co.	2.8095	LTD.
3/15/55	1,100,000	Warren Twp # 5, Macomb Co.	2.526	LTD.
2/9/55	350,000	Wright Twp, Hillsdale & Lenawee Co.	2.5582	LTD.
3/21/55	75,000	Wyoming Twp # 2, Kent Co.	2.488	LTD.



TABLE XXVI (Continued)

MICHIGAN SCHOOL BONDS MARKETING JANUARY 1, 1955 TO JANUARY 1, 1957
JULY 1, 1955 TO JANUARY 1, 1956

Date sale	Amount issue	School District	Average Interest cost	Type of bond
9/9/55	50,000	Manistique Twp, Schoolcraft Co.	3.124	LTD.
8/17/55	52,000	Alamo & Cooper Twp # 6, Kalamazoo Co.	3.03	LTD.
8/24/55	990,000	City of Allegan, Allegan Co.	3.0209	UNLTD.
11/7/55	135,000	Argentine & Deerfield # 1, Genesee Co.	3.50	UNLTD.
11/2/55	135,000	Bear Lake R.A., Manistee, Co.	3.3230	LTD.
11/9/55	130,000	Bedford R.A., Monroe, Co.	2.414	LTD.
12/8/55	480,000	Bellvue Comm Eaton, Barry & Calhoun	3.4525	UTQ.
9/14/55	84,000	Benton Twp. # 1, Berrien Co.	2.9457	LTD.
8/17/55	845,000	Benzonia R.A., Benzie Co.	3.25577	UNLTD.
10/24/55	750,000	Berkley, Oakland Co.	3.1964	UTQ.
9/21/55	45,000	Berlin Twp., Monroe Co.	2.9179	LTD.
9/27/55	2,000,000	Birmingham, Oakland Co.	2.8896	UNLTD.
7/26/55	250,000	Blackman & Leoni Twp. # 16, Jackson	3.307	UNLTD.
9/7/55	800,000	Bloomfield Hills, Oakland Co.	2.7986	UNLTD.
10/7/55	550,000	Bloomfield Twp # 3 Frl. Oakland Co.	3.20	UNLTD.
7/20/55	150,000	Boston & Berlin Twp # 3 Frl., Ionia Co.	2.8627	LTD.
9/22/55	235,000	Britton, Macomb Aga Lenawee & Monroe	3.0136	UTQ.
10/19/55	390,000	Burton Twp Sch # 5, Genesee Co.	3.5792	UTQ.
11/3/55	325,000	Burton Twp Sch # 16, Genesee Co.	3.5021	UTQ.
10/27/55	700,000	Capac Comm Sch., St. Clair Co.	3.26601	UTQ.
9/29/55	160,000	Cement City, Jackson Co.	3.499	UTQ.
8/4/55	750,000	Charlotte, Eaton Co.	2.71597	LTD.
8/30/55	365,000	Chesterfield, Lenox # 9, Macomb Co.	3.43	UTQ.

TABLE XXVI (Continued)

MICHIGAN SCHOOL BONDS MARKETING JANUARY 1, 1955 TO JANUARY 1, 1957
JULY 1, 1955 TO JANUARY 1, 1956

Date sale	Amount issue	School District	Average interest cost	Type of bond
10/27/55	325,000	Coloma, Berrien Co.	3.0877	LTD.
8/4/55	90,000	Comstock # 7 Fr., Kalamazoo Co.	2.6917	LTD.
11/3/55	350,000	Cooper Sch., Wayne Co.	3.5331	UTQ.
8/22/55	116,000	Groton R.A., Newaygo Co.	2.47	LTD.
7/7/55	100,000	Deckerville, Sanilac Co.	2.2649	LTD.
7/6/55	160,000	Detour # 1, Chippewa Co.	3.99	LTD.
10/11/55	110,000	Diamondale Area, Eston Co.	2.9378	LTD.
12/7/55	100,000	East Cooper, Kalamazoo Co.	3.249	UTQ.
9/1/55	410,000	East Jordan, Charlevoix Co.	3.3225	LTD.
8/16/55	38,000	Egleston Twp. # 2, Muskegon Co.	2.968	LTD.
7/28/55	30,000	Elba & Washington Twp., Gratiot Co.	3.469	UNLTD.
7/1/55	190,000	Elmwood # 6 Fr., Leelanaw Co.	3.139	LTD.
10/26/55	130,000	Flushing Comm., Genesee Co.	2.837	LTD.
8/18/55	120,000	Forest Home Twp # 3, Antrim Co.	2.896	LTD.
7/13/55	35,000	Fort Gratiot Twp., St. Clair Co.	3.00	UNLTD.
10/5/55	325,000	Frankenmuth Twp., Saginaw Co.	2.5377	LTD.
8/2/55	130,000	Fruitport # 3, Muskegon Co.	2.991	LTD.
7/21/55	1,250,000	Garden City, Wayne Co.	3.4302	UTQ.
12/28/55	70,000	Grand Prairie, Kalamazoo Co.	3.47	UNLTD.
10/20/55	250,000	Grand Rapids Twp # 7, Kent Co.	3.29395	LTD.
10/4/55	625,000	Grossel Isle, Wayne Co.	2.8454	UNLTD.
11/15/55	240,000	Gustafson # 15, Muskegon Co.	4.00	UTQ.
10/26/55	1,500,000	Harper Woods, Wayne Co.	3.0436	UTQ.
10/19/55	98,000	Hesperia, Newaygo Co.	3.5918	UTQ.
10/6/55	75,000	Hillman R.A., Montmorency Co.	3.79	UTQ.

TABLE XXVI (Continued)

MICHIGAN SCHOOL BONDS MARKETING JANUARY 1, 1955 TO JANUARY 1, 1957
JULY 1, 1955 TO JANUARY 1, 1956

Date sale	Amount issue	School District	Average interest cost	Type of bond
7/13/55	65,000	Holland & Park Twp., Ottawa Co.	2.717	LTD.
12/13/55	1,525,000	Holt	4.04	UTQ.
8/19/55	40,000	Honor R.A., Benzie Co.	2.75	LTD.
8/22/55	480,000	Houghton Lake, Rosecommon Co.	3.50	UNLTD.
7/14/55	700,000	Jefferson Consol., Monroe Co.	3.490	UTQ.
12/27/55	33,000	Jefferson Twp. # 2, Cass Co.	3.25	UTQ.
8/18/55	214,000	Kalamazoo Twp. # 20, Kalamazoo Co.	3.1247	UTQ.
10/18/55	550,000	Kearsley R.A., Genesee Co.	3.5558	UTQ.
9/6/55	750,000	Lake Orion, Oakland Co.	3.248	UTQ.
11/15/55	141,000	Lake Section # 53, St. Joseph Co.	2.9675	LTD.
10/13/55	700,000	Lakeville, Genesee Co.	3.6672	UTQ.
9/8/55	260,000	L'Anse Creuse, Macomb Co.	3.37	UTQ.
9/7/55	90,000	Lansing Fr., Ingham Co.	3.37	LTD.
11/9/55	335,000	Lincoln Sch., Muskegon Co.	2.9922	LTD.
9/8/55	250,000	Lowell Twp. # 1, Kent Co.	2.9607	UNLTD.
10/26/55	110,000	Mellen Twp. Sch., Menominee Co.	3.1437	LTD.
8/3/55	165,000	Meridian Twp. # 8, Ingham Co.	3.0596	LTD.
10/20/55	390,000	Merrill Com. Sch., Saginaw Co.	3.3845	UTQ.
8/25/55	400,000	Millington # 2, Tuscola Co.	3.2716	UTQ.
11/1/55	575,000	Morenci Area # 10, Lenawee Co.	2.9131	LTD.
9/15/55	730,000	Mt. Morris, Genesee Co.	3.606	LTD.
9/22/55	840,000	Nankin & Dearborn # 2, Wayne Co.	3.51552	UTQ.
9/21/55	500,000	Inkster, Wayne Co.	3.8482	UTQ.

TABLE LXVI (Continued)

MICHIGAN SCHOOL BONDS MARKETED JANUARY 1, 1955 TO JANUARY 1, 1957
JULY 1, 1955 TO JANUARY 1, 1956

Date sale	Amount issue	School District	Average interest cost	Type of bond
12/15/55	55,000	Nashville, W.K. Kellogg, Barry Co.	2.3675	LTD.
10/10/55	72,000	Hiles & Howard 3 Frl., Berrien Co.	2.9448	LTD.
8/24/55	325,000	M. Muskegon, Muskegon Co.	3.055	UNLTD.
7/19/55	700,000	Northwest R.A., Jackson Co.	3.058	LTD.
8/16/55	550,000	Norton Twp. # 1 Frl., Muskegon Co.	3.1366	LTD.
11/17/55	4,500,000	Oak Park, Oakland Co.	3.3870	UTQ.
7/11/55	500,000	Owosso, Shiawassee Co.	2.408	LTD.
9/1/55	63,000	Owosso Twp. # 1, Shiawassee Co.	3.39	LTD.
7/18/55	20,000	Owosso & Bennington # 2, Shiawassee Co.	3.4949	LTD.
11/28/55	50,000	Owosso & Caledonia, Shiawassee Co.	3.0463	LTD.
8/29/55	140,000	Paris Twp. # 5, Kent Co.	2.9343	LTD.
9/21/55	70,000	Park Comm Sch. # 1, St. Joseph Co.	2.99	LTD.
8/31/55	155,000	Park Twp. # 2, Ottawa Co.	3.328	LTD.
7/7/55	395,000	Pennfield Agr., Calhoun Co.	2.84675	LTD.
8/10/55	18,000	Pipestone & Sodus # 3, Berrien Co.	3.800	LTD.
10/20/55	22,000	Plainfield Twp., Kent Co.	3.746	LTD.
12/19/55	70,000	Plainfield Twp. # 9, Kent Co.	2.5369	LTD.
8/16/55	1,250,000	Plainfield, Allegan Co.	2.8425	LTD.
7/19/55	3,000,000	Plymouth, Wayne Co.	2.9967	LTD.
12/8/55	40,000	Port Austin, Huron Co.	2.48334	LTD.
9/28/55	1,600,000	Portage, Kalamazoo Co.	2.87	LTD.

Figure 1. The effect of the number of trials on the number of correct responses. The number of correct responses was plotted against the number of trials for each condition. The number of correct responses increased with the number of trials for all conditions. The number of correct responses was highest for the condition with the highest number of trials (10 trials) and lowest for the condition with the lowest number of trials (2 trials).



1. The first group of people who are not in the labor force are those who are not in the labor force because they are not in the labor force.

1. *What is the purpose of this document?*
 2. *What are the main findings of the study?*
 3. *What are the implications of the findings?*
 4. *What are the limitations of the study?*
 5. *What are the conclusions of the study?*

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TABLE XXVI (Continued)

MICHIGAN SCHOOL BONDS MARKETING JANUARY 1, 1955 TO JANUARY 1, 1957
JULY 1, 1955 TO JANUARY 1, 1956

Date sale	Amount issue	School District	Average interest cost	Type of bond
12/5/55	750,000	Redford Union, Wayne Co.	3.3675	UTQ.
10/27/55	100,000	Riverton 2 Frl., Macomb Co.	2.98	LTD.
11/29/55	750,000	Roseville, Macomb Co. Series II	3.5189	UTQ.
8/1/55	750,000	Roseville, Macomb Co. Series I	3.35068	UTQ.
11/7/55	1,000,000	Royal Oak Troy # 4, Oakland Co.	3.50436	UTQ.
8/31/55	750,000	St. Clair Shores, Macomb Co.	3.83	UTQ.
12/7/55	55,000	St. Joseph # 2, Berrien Co.	2.9238	LTD.
8/3/55	90,000	Saugatuck Twp. # 3, Allegan Co.	3.0585	LTD.
10/20/55	160,000	Shelby, Oceana Co.	2.857	LTD.
10/20/55	1,000,000	Utica, Macomb Co.	3.280199	UNLTD.
7/11/55	45,000	Silver Creek # 5, Cass Co.	2.91	LTD.
7/27/55	80,000	Sodus # 2, Berrien Co.	2.94	LTD.
11/1/55	3,500,000	Southfield, Oakland Co.	3.39868	UNLTD.
11/16/55	1,000,000	South Lk. Sch., Macomb Co.	3.4450	UTQ.
8/31/55	225,000	Stanwood R.A., Mecosta Co.	2.81004	LTD.
10/19/55	72,000	Tallmadge # 4, Ottawa Co.	3.6947	UNLTD.
7/28/55	775,000	Tawas R.A., Iosco Co.	3.2583	UTQ.
8/17/55	450,000	Three Rivers, St. Joseph Co.	2.7687	LTD.
10/13/55	30,000	Turk Lk. Sch., Montcalm Co.	3.195	LTD.
9/21/55	55,000	Tuscola # 1, Tuscola Co.	3.4124	LTD.
7/13/55	330,000	Walker Twp. # 7, Kent Co.	2.8835	LTD.
10/17/55	275,000	Walled Lake, Oakland Co. Ser. A.	3.268	LTD.
10/12/55	425,000	Watertown Fr., Sanilac Co.	3.244	UTQ.
9/29/55	35,000	Wheeler Twp. # 8, Gratiot Co.	3.2704	UNLTD.
8/13/55	65,000	Whitefish Twp., Chippewa Co.	3.5032	LTD.
10/5/55	1,870,000	Ypsilanti # 1, Washtenaw Co.	3.29802	UTQ.

TABLE XXVI (Continued)

MICHIGAN SCHOOL BONDS MARKETING JANUARY 1, 1955 TO JANUARY 1, 1957
JANUARY 1, 1956 TO JULY 1, 1956

Date sale	Amount issue	School District	Average interest cost	Type of bond
5/23/56	4,500,000	Adrian, Lenawee Co.	2.6939	UTQ.
1/25/56	600,000	Albion, Calhoun Co.	2.2608	LTD.
3/8/56	960,000	Alcona, Alcona Co.	3.49983	UTQ.
3/29/56	350,000	Allegan County Dist. # 5	3.24875	UNLTD.
3/26/56	180,000	Alpena Dist. # 8, Alpena Co.	3.6423	UNLTD.
2/16/56	3,200,000	Ann Arbor, Washtenaw Co.	2.2422	UTQ.
5/3/56	90,000	Atlanta, Montmorency Co.	3.7912	UTQ.
1/10/56	620,000	Bangor, VanBuren Co.	3.3152	UTQ.
5/7/56	79,000	Belmont, Kent Co.	3.4644	UTQ.
2/6/56	25,000	Sch. Dist. # 26, Berrien Co.	2.9315	LTD.
4/9/56	125,000	Sch. Dist. # 37, Berrien Co.	3.507	UTQ.
6/20/56	350,000	Bowen Sch. Dist. Kent Co.	3.3136	UTQ.
2/14/56	200,000	Caledonia, Kent Co.	2.70932	LTD.
2/10/56	47,000	Casco Twp. # 2, Allegan Co.	3.107	LTD.
3/26/56	530,000	Churchill Sch. Dist., Muskegon Co.	3.3993	UTQ.
4/16/56	550,000	Clinton Sch. # 4, Lenawee Co.	3.3679	UTQ.
1/13/56	23,000	Clinton & Macomb # 3, Macomb Co.	3.75	LTD.
3/27/56	550,000	Clinton Valley, Macomb Co.	3.7089	UTQ.
6/13/56	300,000	Coldwater, Branch Co.	2.7545	LTD.
3/14/56	500,000	Dearborn Twp. # 3, Wayne Co.	3.4594	UTQ.
4/18/56	2,200,000	Dearborn Dist. # 7, Wayne Co.	3.99	UTQ.
5/23/56	250,000	Delta Dist. # 10, Delta Co.	3.989	UTQ.
6/5/56	250,000	Dye Comm. Sch., Genesee Co.	2.668	UTQ.

1. The first part of the report is a general introduction to the subject of the study. It discusses the importance of the study and the objectives of the research.

2. The second part of the report is a detailed description of the methodology used in the study. It includes information about the sample size, the data collection methods, and the statistical analysis techniques.

3. The third part of the report is a detailed description of the results of the study. It includes information about the mean values, the standard deviations, and the correlations between the variables. The results are presented in a clear and concise manner, using tables and graphs where appropriate.

4. The fourth part of the report is a discussion of the results of the study. It discusses the implications of the findings and the limitations of the study. It also provides suggestions for further research.

5. The fifth part of the report is a conclusion. It summarizes the main findings of the study and provides a final statement on the importance of the research.

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TABLE XXVI (Continued)

MICHIGAN SCHOOL BONDS MARKETED JANUARY 1, 1955 TO JANUARY 1, 1957
 JANUARY 1, 1956 TO JULY 1, 1956

Date sale	Amount issue	School District	Average interest cost	Type of bond
2/8/56	180,000	East Bay, Grand Traverse Co.	3.1433	LTD.
6/11/56	1,500,000	East Detroit, Macomb Co.	3.516	UTQ.
1/12/56	345,000	Edwardsburg, Cass Co.	3.0314	LTD.
5/28/56	1,400,000	Fenton Area, Genesee Co.	3.3389	UTQ.
4/16/56	1,000,000	Ferndale, Oakland Co.	3.498	UTQ.
5/2/56	100,000	Flat Rock, Delta Co.	3.79006	UTQ.
1/10/56	115,000	Ford River, Delta Co.	3.2286	LTD.
1/23/56	1,300,000	Fraser, Macomb Co.	3.7796	UTQ.
4/5/56	140,000	Gaines # 9 Fr., Genesee Co.	2.955	LTD.
4/12/56	3,300,000	Garden City, Wayne Co.	3.9965	UTQ.
3/26/56	310,000	Gibraltar Dist., Wayne Co.	2.97747	LTD.
4/5/56	425,000	Gladwin, Gladwin Co.	3.56	UTQ.
6/20/56	300,000	Grand Blanc, Genesee Co.	3.3516	UTQ.
5/28/56	65,000	Grand Haven Twp. # 1, Ottawa Co.	3.18	LTD.
3/15/56	3,475,000	Grosse Pointe, Wayne Co.	2.49643	UTQ.
1/24/56	269,000	Gull Road Sch. # 38, Kalamazoo Co.	2.9286	LTD.
6/21/56	1,270,000	Harper Creek, Calhoun Co.	3.51785	UTQ.
1/9/56	13,000	Hager Twp. # 1, Berrien Co.	3.24	LTD.
2/2/56	450,000	Homer, Calhoun Co.	2.8099	LTD.
6/18/56	285,000	Sch. Dist. # 4, Ingham & Eaton Co.	3.6089	UTQ.
1/31/56	346,000	Kimball Sch. Dist., St. Clair Co.	3.3090	UTQ.
6/13/56	750,000	Lake Orion, Oakland Co.	3.388	UTQ.
1/4/56	1,500,000	Lake Shore Sch., Macomb Co.	3.8060	UTQ.

TABLE XXVI (Continued)

MICHIGAN SCHOOL BONDS MARKETING JANUARY 1, 1955 TO JANUARY 1, 1957
JANUARY 1, 1956 TO JULY 1, 1956

Date sale	Amount issue	School District	Average interest cost	Type of bond
4/5/56	1,500,000	Lakeview Sch., Macomb Co.	3.8245	UTQ.
4/19/56	155,000	Ieland Sch., Leelanau Co.	3.3067	LTD.
4/19/56	260,000	Lincoln 2 Fr., Berrien Co.	3.1279	LTD.
6/5/56	200,000	Little Field Sch., Emmet Co.	3.61	LTD.
6/19/56	4,000,000	Livonia, Wayne Co.	3.2795	UTQ.
3/14/56	165,000	Luther Comm. Sch., Lake Co.	3.5532	UTQ.
5/9/56	268,000	Mackinaw City, Emmet & Cheb. Co.	3.77735	UNLTD.
3/19/56	360,000	Mancelona, Antrim & Kalkaska Co.	3.21	LTD.
2/28/56	1,530,000	Marquette, Marquette Co.	2.66	UTQ.
2/23/56	200,000	Sch. Dist. # 10, Marquette Co.	3.36106	UTQ.
6/6/56	85,000	Moline, Allegan Co.	3.16	LTD.
2/9/56	3,000,000	Mount Clemens, Macomb Co.	3.19258	UTQ.
6/26/56	400,000	McBain R.A., Missaukee Co.	3.999	UTQ.
2/13/56	350,000	Nankin Twp. # 1, Wayne Co.	4.11449	UTQ.
3/16/56	48,000	Newburg & Marcellus # 6, Cass Co.	3.115	LTD.
4/5/56	180,000	New Lothrop, Shiawassee Co.	3.68	UTQ.
1/18/56	400,000	North Adams, Hillsdale & Jackson Co.	3.23586	UTQ.
3/29/56	150,000	Dist. # 36, Ottawa Co.	3.2495	UNLTD.
5/8/56	125,000	Dist. # 39, Ottawa Co.	3.2357	LTD.
2/15/56	60,000	Pere Marquette Twp. # 2, Mason Co.	3.225	UNLTD.
4/18/56	650,000	Petoskey, Emmet Co.	2.9658	LTD.
2/14/56	290,000	Pickford, Chippewa & Mackinac Co.	3.32279	UTQ.

Figure 1. The effect of the number of trials on the number of correct responses. The number of correct responses was significantly higher than the number of incorrect responses for all groups. The number of correct responses was significantly higher than the number of incorrect responses for all groups. The number of correct responses was significantly higher than the number of incorrect responses for all groups.

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98	10/10/50	10:00	1000	1000
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TABLE XXVI (Continued)

MICHIGAN SCHOOL BONDS MARKETING JANUARY 1, 1955 TO JANUARY 1, 1957
JANUARY 1, 1956 TO JULY 1, 1956

Date sale	Amount issue	School District	Average interest cost	Type of bond
6/19/56	90,000	Pine Creek Dist. # 40, Ottawa Co.	3.217	LTD.
3/28/56	3,000,000	Pontiac, Oakland Co.	2.496	LTD.
5/24/56	350,000	Posen Consol., Presque Isle	3.8725	UTQ.
6/11/56	1,150,000	Rochester, Oakland & Macomb Co.	2.9711	UTQ.
6/12/56	150,000	Rogers, Kent Co.	3.1402	UTQ.
6/28/56	750,000	Romeo, Macomb & Oakland Co.	3.1722	LTD.
5/9/56	1,300,000	Romulus, Wayne Co.	3.7141	UTQ.
5/15/56	1,500,000	Roseville, Macomb Co.	3.5823	UTQ.
1/25/56	2,500,000	Royal Oak, Oakland Co.	3.09858	UNLTD.
6/21/56	2,000,000	Royal Oak Dist. # 4, Oakland Co.	4.1285	UTQ.
4/23/56	1,500,000	Royal Oak # 10, Oakland Co.	4.0268	UTQ.
4/3/56	50,000	Rush 1 Fr., Shiawassee Co.	3.0261	LTD.
2/9/56	155,000	Saginaw 1 Fr., Saginaw Co.	2.917	LTD.
3/14/56	22,000	St. Charles Dist. # 3, Saginaw Co.	3.24	LTD.
5/3/56	50,000	Sheridan R.A., Montcalm Co.	2.69	LTD.
5/23/56	95,000	Shiawassee # 9 Fr., Shiawassee Co.	3.7156	UTQ.
6/27/56	490,000	Shields Sch. Dist., Saginaw Co.	4.0946	UTQ.
3/14/56	20,000	Sodus # 5, Berrien Co.	2.886	LTD.
1/23/56	320,000	Soo Twp. Sch. # 12, Chippewa Co.	3.4081	UTQ.
5/2/56	1,485,000	South Lk. Sch., Macomb Co.	3.69373	UTQ.
3/6/56	125,000	Spring Arbor Sch. # 1, Jackson Co.	3.6036	UTQ.
3/14/56	75,000	Stephenson, Menominee Co.	2.7207	LTD.

TABLE XXVI (Continued)

MICHIGAN SCHOOL BONDS MARKETING JANUARY 1, 1955 TO JANUARY 1, 1957
JANUARY 1, 1956 TO JULY 1, 1956

Date sale	Amount issue	School District	Average interest cost	Type of bond
1/25/56	590,000	Swartz Creek, Genesee Co.	2.6888	LTD.
3/27/56	1,500,000	Troy Twp. # 1, Oakland Co.	3.4155	UTQ.
1/5/56	25,000	Tuscola, Saginaw & Newaygo Co. # 7	3.1006	LTD.
1/26/56	145,000	Union City, Calhoun Co.	2.5708	LTD.
6/26/56	1,000,000	Utica, Macomb Co.	3.4899	UNLTD.
5/24/56	125,000	Vanderbilt, Otsego & Charlevoix Co.	3.5491	LTD.
1/11/56	55,000	Walker Dist. # 6, Kent Co.	2.9936	LTD.
3/12/56	350,000	Walled Lake, Oakland Co.	3.368	UTQ.
4/10/56	2,000,000	Warren, Macomb Co.	3.6862	UNLTD.
6/4/56	250,000	Warren Woods, Macomb Co.	3.8101	UTQ.
1/12/56	130,000	Wayland Union, Allegan Co.	2.93143	LTD.
6/18/56	2,600,000	Wayne Comm., Wayne Co.	3.2602	UTQ.
4/24/56	150,000	White Lake # 7, Oakland Co.	3.9971	UTQ.
1/23/56	220,000	Williams & Monitor 3 Fr., Bay Co.	3.07583	LTD.
4/16/56	96,000	Williams Twp. #5, Bay Co.	3.37618	LTD.
5/8/56	150,000	Windemere Sch., Ingham Co.	2.7274	LTD.
4/25/56	23,000	Woodhull Dist. # 3, Shiawassee Co.	3.347	LTD.
5/24/56	75,000	Woodland Comm., Barry Co.	2.74	LTD.
4/5/56	590,000	Zeeland Sch. # 46, Ottawa Co.	2.5947	LTD.

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Figure 1. The effect of the concentration of the *Agrobacterium* suspension on the transformation efficiency of *Agrobacterium* strains. The concentration of the *Agrobacterium* suspension was 10⁶ cells/ml (a), 10⁷ cells/ml (b), 10⁸ cells/ml (c), and 10⁹ cells/ml (d). The concentration of the *Agrobacterium* suspension was 10⁶ cells/ml (a), 10⁷ cells/ml (b), 10⁸ cells/ml (c), and 10⁹ cells/ml (d). The concentration of the *Agrobacterium* suspension was 10⁶ cells/ml (a), 10⁷ cells/ml (b), 10⁸ cells/ml (c), and 10⁹ cells/ml (d). The concentration of the *Agrobacterium* suspension was 10⁶ cells/ml (a), 10⁷ cells/ml (b), 10⁸ cells/ml (c), and 10⁹ cells/ml (d).

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TABLE XXVI (continued)

MICHIGAN SCHOOL BONDS MARKETING JANUARY 1, 1955 to JANUARY 1, 1957
JULY 1, 1956 to JANUARY 1, 1957

Date of sale	Amount of issue	District	Average interest cost	Type of bond
11/7/56	22,000	Ada # 8 Frl, Kent Co.	4.5292	UTQ.
8/14/56	20,000	Arcada Twp # 1, Gratiot Co.	3.4869	LTD.
11/26/56	150,000	Armada Sch, Macomb Co.	4.999	ULTD.
8/9/56	40,000	Augusta Twp, Washtenaw Co.	3.48	LTD.
10/23/56	350,000	Bad Axe, Huron Co.	3.1066	LTD.
11/13/56	100,000	Banner # 36, Saginaw Co.	4.80	UTQ.
10/4/56	195,000	Banks Twp, Antrim & Charlevoix Co.	4.217	UTQ.
10/25/56	23,000	Beaver Island Shh, Charlevoix Co.	3.8273	LTD.
12/13/56	425,000	Bentley, Genesee Co.	4.342	UTQ.
12/10/56	500,000	Berkely, Oakland Co.	4.0801	UTQ.
7/24/56	400,000	Sch # 48, Berrien Co.	3.3141	LTD.
10/10/56	19,500	Bertrand, Berrien Co.	3.7607	LTD.
7/7/56	2,000,000	Birmingham, Oakland Co.	3.0775	ULTD.
8/15/56	177,000	Blackman, Jackson Co. # 9 Frl.	4.12631	UTQ.
12/13/56	1,350,000	Blissfield, Lenawee & Monroe Co.	3.81	LTD.
9/13/56	650,000	Brandon Twp, Oakland & Lapeer Co.	4.0625	UTQ.
8/14/56	500,000	Brighton, Livingston Co.	3.8841	UTQ.
10/15/56	450,000	Brownston, Wayne & Monroe Co. # 1 Frl.	4.1484	UTQ.
8/13/56	40,000	Brownston, # 3 Frl, Wayne Co.	3.50	ULTD.
10/21/56	165,000	Burr Oak, Kent Co.	4.3097	UTQ.
12/5/56	900,000	Caro, Tuscola Co.		
9/19/56	320,000	Carpenter, Washtenaw Co.	4.1995	UTQ.
8/13/56	340,000	Carr # 6, Muskegon Co.	4.69645	UTQ.
8/13/56	110,000	Dist 3 36, Cass Co.	4.25	UTQ.

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TABLE XXVI (continued)

MICHIGAN SCHOOL BONDS MARKETING JANUARY 1, 1955 to JANUARY 1, 1957
JULY 1, 1956 to JANUARY 1, 1957

Date of sale	Amount of issue	District	Average interest cost	Type of bond
10/22/56	2,200,000	Chelsea, Washtenaw & Jackson Co.	4.1891	UTQ.
12/12/56	160,000	Clarkdale # 19, Jackson Co.	4.3969	UTQ.
11/26/56	375,000	Clarkston Community, Oakland Co.	4.413979	UTQ.
7/1/56	500,000	Clarkston Community, Oakland Co.	3.7222	UTQ.
7/9/56	500,000	Clawson, Oakland Co.	3.999	UTQ.
8/8/56	723,000	Clintondale, Macomb Co.	4.6572	UTQ.
7/11/56	313,000	Concord, Community, Jackson Co.	3.603	UTQ.
7/11/56	498,000	Constantine, St. Joseph Co.	3.5745	UTQ.
10/31/56	500,000	Cooper, Wayne Co.	4.3499	UTQ.
11/27/56	110,000	Cornell Sch, Delta Co.	5.00	UTQ.
7/18/56	14,000,000	Dearborn, Wayne Co.	2.92592	LTD.
10/24/56	485,000	Dearborn # 2, Wayne Co.	4.1456	UTQ.
10/11/56	200,000	Dewitt Sch, Clinton Co.	4.03	UTQ.
8/29/56	1,250,000	Dexter Comm Sch, Washtenaw Co.	4.00	UTQ.
10/9/56	1,200,000	Dibble # 12, Jackson Co.	4.08	UTQ.
12/12/56	2,000,000	East Detroit, Macomb Co.	4.643	UTQ.
7/18/56	250,000	Fair Plain, Berrien Co.	3.16733	LTD.
7/10/56	2,000,000	Farmington, Oakland Co.	3.5389	UTQ.
10/1/56	750,000	Farmington # 5 Oakland & Wayne Co.	4.5366	UTQ.

TABLE XXVI (continued)

MICHIGAN SCHOOL BONDS MARKETING JANUARY 1, 1955 to JANUARY 1, 1957
JULY 1, 1956 to JANUARY 1, 1957

Date of sale	Amount of issue	District	Average interest cost	Type of bond
11/21/56	300,000	Flint Twp # 5, Genesee Co.	4.499	UTQ.
11/20/56	325,000	Fort Gratiot, St. Clair Co.	4.4987	UTQ.
7/2/56	45,000	Gaines & Paris # 1, Kent Co.	3.1238	LTD.
8/3/56	55,000	Garfield # 8 Frl, Grand Traverse Co.	3.2458	LTD.
10/30/56	500,000	Glenn Lake, Leelenaw Co.	4.54	UTQ.
8/30/56	70,000	Grand Haven # 2, Ottawa Co.	3.4042	LTD.
11/8/56	350,000	Grandville, Kent Co.	3.998	UTQ.
10/10/56	20,000	Guntton, Grand Traverse Co.	3.761	LTD.
7/19/56	50,000	Hamlin Twp, Mason Co.	2.93	LTD.
12/5/56	198,000	Harrington # 11, Jackson Co.	4.419	UTQ.
11/8/56	350,000	Harrison Comm, Clare Co.	4.408	UTQ.
9/24/56	425,000	Hile # 18, Muskegon Co.	3.7982	LTD.
11/1/56	1,200,000	Holly Area, Oakland Co.	4.1895	UTQ.
8/21/56	130,000	Holton # 1, Muskegon Co.	4.2814	UTQ.
7/17/56	30,000	Horsebrook, Ingham & Eaton Co.	3.1914	LTD.
11/1/56	225,000	Howard City, Newago Co.	4.1012	UTQ.
7/1/56	1,550,000	Hudson, Lenawee & Hillsdale Co.	3.8992	UTQ.
10/18/56	36,000	Janus Twp # 4, Saginaw Co.	3.4675	LTD.
8/22/56	655,000	Jonesville, Hillsdale Co.	3.98597	UTQ.
9/25/56	10,000,000	Kalamazoo, Kalamazoo Co.	2.6876	UTLD.

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TABLE XXVI (continued)

MICHIGAN SCHOOL BONDS MARKETING JANUARY 1, 1955 to JANUARY 1, 1957
JULY 1, 1956 to JANUARY 1, 1957

Date of sale	Amount of issue	District	Average interest cost	Type of bond
12/6/56	280,000	Lakeview Com Sch, Montcalm Co.	4.31163	UTQ.
12/17/56	2,000,000	L'Anse Creuse, Macomb Co.	4.7951	UTQ.
8/7/56	600,000	Litchfield, Hillsdale Co.	3.9936	UTQ.
11/14/56	750,000	Madison # 2, Lenawee Co.	4.423	LTD.
9/20/56	185,000	Merridan Twp # 7, Ingham Co.	4.3091	UTQ.
10/2/56	3,100,000	Midland, Midland Co.	2.861	LTD.
9/27/56	525,000	Napoleon R A, Jackson Co.	4.0935	UTQ.
11/20/56	2,500,000	Oak Park, Oakland Co.	4.5179	UTQ.
11/20/56	110,000	Dist # 50, Ottawa Co.	3.999	LTD.
8/8/56	189,000	Pittsfield, Washtenaw Co.	3.9682	UTQ.
8/28/56	195,000	Plainfield # 4, Saginaw Co.	3.751	LTD.
11/20/56	160,000	Portage Twp # 8, Mackinac Co.	4.50	ULTD.
8/27/56	90,000	Port Huron Twp, St. Clair Co.	3.174	LTD.
9/17/56	750,000	Redford Union, Wayne Co.	4.02657	UTQ.
11/8/56	580,000	Reese Sch, Saginaw & Bay Co.	4.27808	UTQ.
7/11/56	525,000	Richland Comm, Kalamazoo Co.	3.3507	UTQ.
10/16/56	1,500,000	Roseville, Macomb Co.	4.1160	UTQ.
11/15/56	2,400,000	Royal Oak, Oakland Co.	4.253	ULTD.

TABLE XXVI (continued)

MICHIGAN SCHOOL BONDS MARKETED JANUARY 1, 1955 to JANUARY 1, 1957
JULY 1, 1956 to JANUARY 1, 1957

Date of sale	Amount of issue	District	Average interest cost	Type of bond
7/18/56	65,000	Sand Lake, Kent Co.	3.405	LTD.
12/3/56	200,000	Sanford, Midland Co.	4.577	UTQ.
12/18/56	120,000	Springport, Jackson Co.	4.50	UTQ.
7/19/56	500,000	Thornapple, Kellogg, Barry Co.	3.4845	UTQ.
12/19/56	500,000	Van Buren Sch, Wayne Co.	4.2432	UTQ.
11/15/56	175,000	Walker Twp # 3, Kent Co.	4.3122	UTQ.
9/12/56	100,000	Walker Twp #14, Kent Co.	3.999	ULTD.
9/26/56	161,000	Warner Sch, Jackson Co.	4.1635	UTQ.
10/4/56	1,000,000	Waterford Twp, Oakland Co.	3.9735	UTQ.
7/11/56	65,000	Westpholia, Portland, Clinton Co.	2.807	LTD.
9/12/56	70,000	Woodhull # 6, Shiawassee Co.	4.49	UTQ.
11/14/56	165,000	Wright # 24, Ottawa Co.	4.464	UTQ.
10/19/56	350,000	Wyoming Twp # 2, Kent Co.	4.0583	UTQ.

TABLE XVII
COMPARISON MICHIGAN SCHOOL BONDS TO TWO TYPES OF NATIONAL BOND NET INT AVGS.

Date of	Amount of in thousands	Ltd M.I.C. in percent	No. of issues	Un. Ltd. M.I.C. in percent	No. of issues	Un. Ltd. Q. M.I.C. in percent	No. of issues	Mat'l avg. M.I.C.*	Mat'l School bond avg. M.I.C.**
1/55	12,418	2.2255	19					2.38	2.41
2/55	2,598	2.7490	12					2.43	2.43
3/55	4,710	2.6812	13					2.45	2.45
4/55	3,439	2.4019	20					2.42	2.46
5/55	2,871	2.4528	14					2.39	2.47
6/55	4,640	2.5860	11					2.39	2.62
7/55	8,775	2.9624	13					2.28	2.71
8/55	9,480	2.9032	16				3	2.24	2.84
9/55	9,092	3.2229	11				5	2.28	2.95
10/55	11,604	3.0078	11				11	2.29	3.00
11/55	13,161	2.9427	6				7	2.24	2.85
12/55	3,178	2.1756	5				4	2.24	2.90
1/56	9,503	2.9599	11				6	2.56	2.90
2/56	9,687	2.9363	6				6	2.48	2.85
3/56	12,670	2.9493	7				9	2.49	2.88
4/56	14,894	3.0874	8				10	2.66	3.10
5/56	12,007	3.0203	6				11	2.76	3.14
6/56	18,170	3.1825	5				15	2.56	2.92
7/56	23,291	3.1081	8				8	2.61	3.04
8/56	5,184	3.4253	6				10	2.71	3.20
9/56	13,186	3.7982	1				7	2.94	3.50
10/56	13,204	3.3206	4				14	2.90	3.30
11/56	10,347	4.2110	2				14	3.08	3.85
12/56	7,743	3.8100	1				10	3.24	3.87

Country	Year	Population	Urban	Rural	Population	Urban	Rural
Algeria	1970	10,000,000	40%	60%	10,000,000	40%	60%
Algeria	1975	11,000,000	45%	55%	11,000,000	45%	55%
Algeria	1980	12,000,000	50%	50%	12,000,000	50%	50%
Algeria	1985	13,000,000	55%	45%	13,000,000	55%	45%
Algeria	1990	14,000,000	60%	40%	14,000,000	60%	40%
Algeria	1995	15,000,000	65%	35%	15,000,000	65%	35%
Algeria	2000	16,000,000	70%	30%	16,000,000	70%	30%
Algeria	2005	17,000,000	75%	25%	17,000,000	75%	25%
Algeria	2010	18,000,000	80%	20%	18,000,000	80%	20%
Algeria	2015	19,000,000	85%	15%	19,000,000	85%	15%
Algeria	2020	20,000,000	90%	10%	20,000,000	90%	10%

Abstract

Age Group	1970	1980	1990	2000	2010	2020
0-14	25	22	18	15	12	10
15-24	18	16	14	12	10	8
25-34	15	14	13	12	11	10
35-44	12	11	10	9	8	7
45-54	10	9	8	7	6	5
55-64	8	7	6	5	4	3
65-74	5	6	7	8	9	10
75+	3	4	5	6	7	8

TABLE XXVIII

ANNUAL PAYMENT WHICH WILL DISCHARGE A \$1,000 BOND
AND ITS INTEREST IN ANY NUMBER OF YEARS UP TO THIRTY

Years	2%	2½%	3%	3½%	4%	4½%	5%
1	1,020.00	1,025.00	1,030.00	1,035.00	1,040.00	1,045.00	1,050.00
2	515.00	518.80	522.60	526.40	530.20	534.00	537.80
3	346.70	350.10	353.50	356.90	360.30	363.80	367.20
4	262.60	265.80	269.00	272.30	275.50	278.70	282.00
5	212.10	215.20	218.40	221.50	224.60	227.80	231.00
6	178.50	181.60	184.60	187.70	190.80	193.90	197.00
7	154.50	157.50	160.50	163.50	166.60	169.70	172.80
8	136.50	139.50	142.50	145.50	148.50	151.60	154.70
9	122.50	125.50	128.40	131.40	134.50	137.60	140.70
10	111.30	114.30	117.20	120.20	123.30	126.40	129.50
11	102.20	105.10	108.10	111.10	114.10	117.20	120.40
12	94.60	97.50	100.50	103.50	106.60	109.70	112.80
13	88.10	91.00	94.00	97.10	100.10	103.30	106.50
14	82.60	85.50	88.50	91.60	94.70	97.80	101.00
15	77.80	80.80	83.80	86.80	89.90	93.10	96.30

[illegible][illegible][illegible]

TABLE XVIII (Continued)

ANNUAL PAYMENT WHICH WILL DISCHARGE A \$1,000 BOND
AND ITS INTEREST IN ANY NUMBER OF YEARS UP TO THIRTY

Years	2%	2½%	3%	3½%	4%	4½%	5%
16	73.60	76.60	79.60	82.70	85.80	89.00	92.30
17	70.00	72.90	76.00	79.00	82.20	85.40	88.70
18	66.70	69.70	72.70	75.80	79.00	82.20	85.50
19	63.80	66.80	69.80	72.90	76.10	79.40	82.70
20	61.20	64.10	67.20	70.40	73.60	76.90	80.20
21	58.80	61.80	64.90	68.00	71.30	74.60	78.00
22	56.60	59.60	62.70	65.90	69.20	72.50	76.00
23	54.70	57.70	60.80	64.00	67.30	70.70	74.10
24	52.90	55.90	59.00	62.30	65.60	69.00	72.50
25	51.20	54.30	57.40	60.70	64.00	67.40	71.00
26	49.70	52.80	55.90	59.20	62.60	66.00	69.60
27	48.30	51.40	54.60	57.90	61.20	64.70	68.30
28	47.00	50.10	53.30	56.60	60.00	63.50	67.10
29	45.80	48.90	52.10	55.40	58.90	62.40	66.00
30	44.60	47.80	51.00	54.40	57.80	61.40	65.10

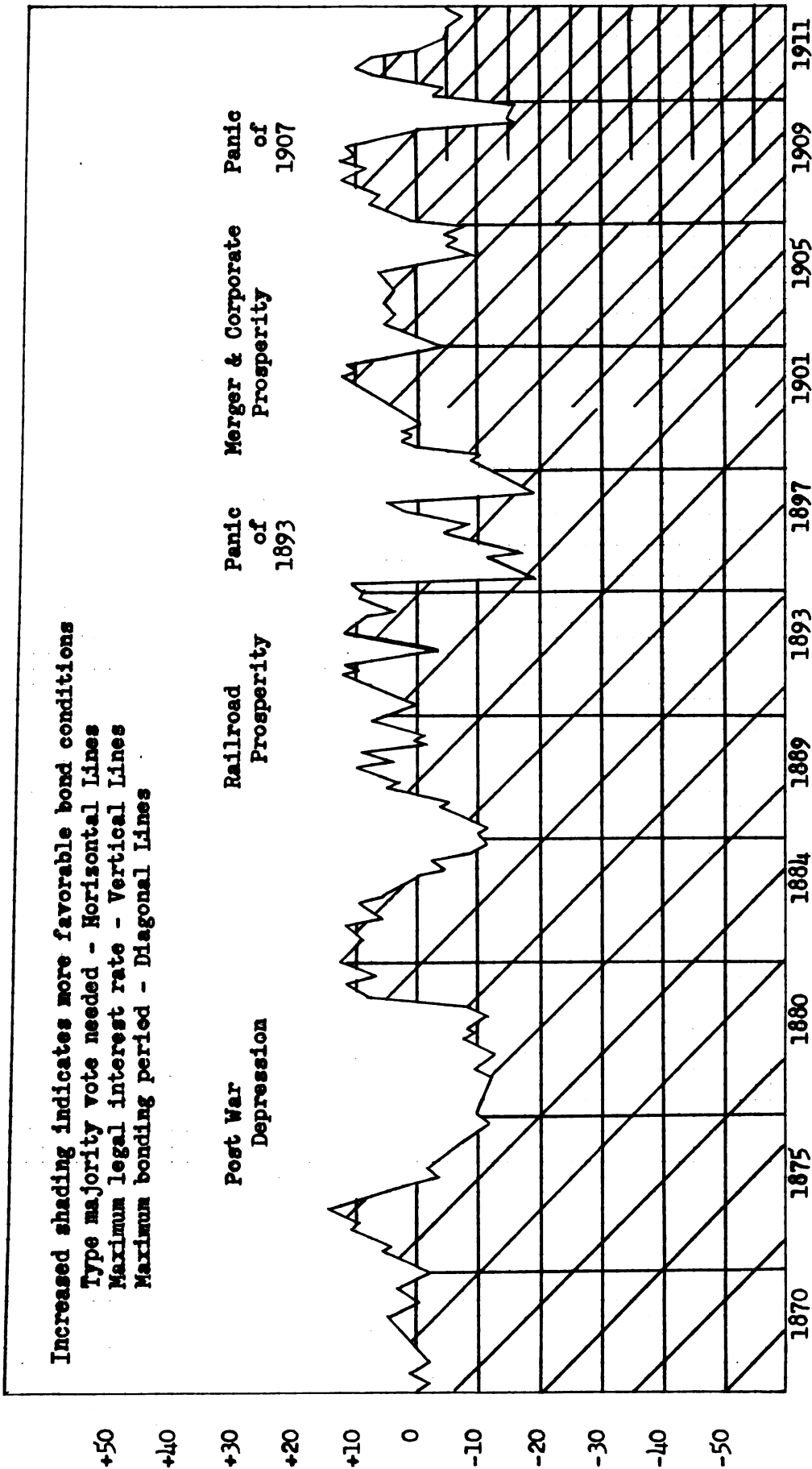


FIGURE 1

COMPARISON, FAVORABLE BONDING TO BUSINESS ACTIVITY*
1867 - 1956

* Fred Rogers Fairchild and Thomas J. Shelly, Understanding Our Free Economy (New York: D. VanNostrand, Inc., 1952), pp. 460-61.

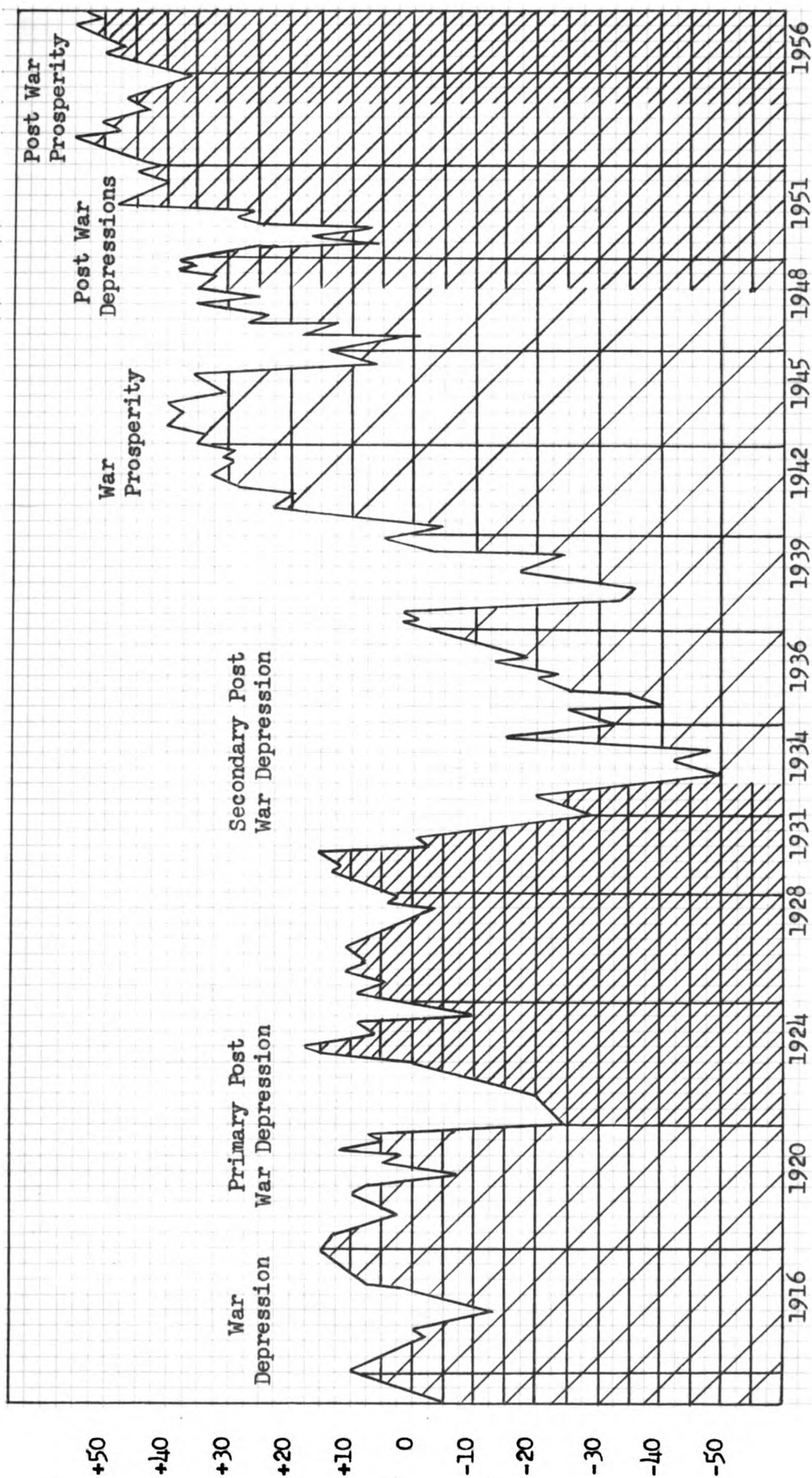


FIGURE 1 (Continued)

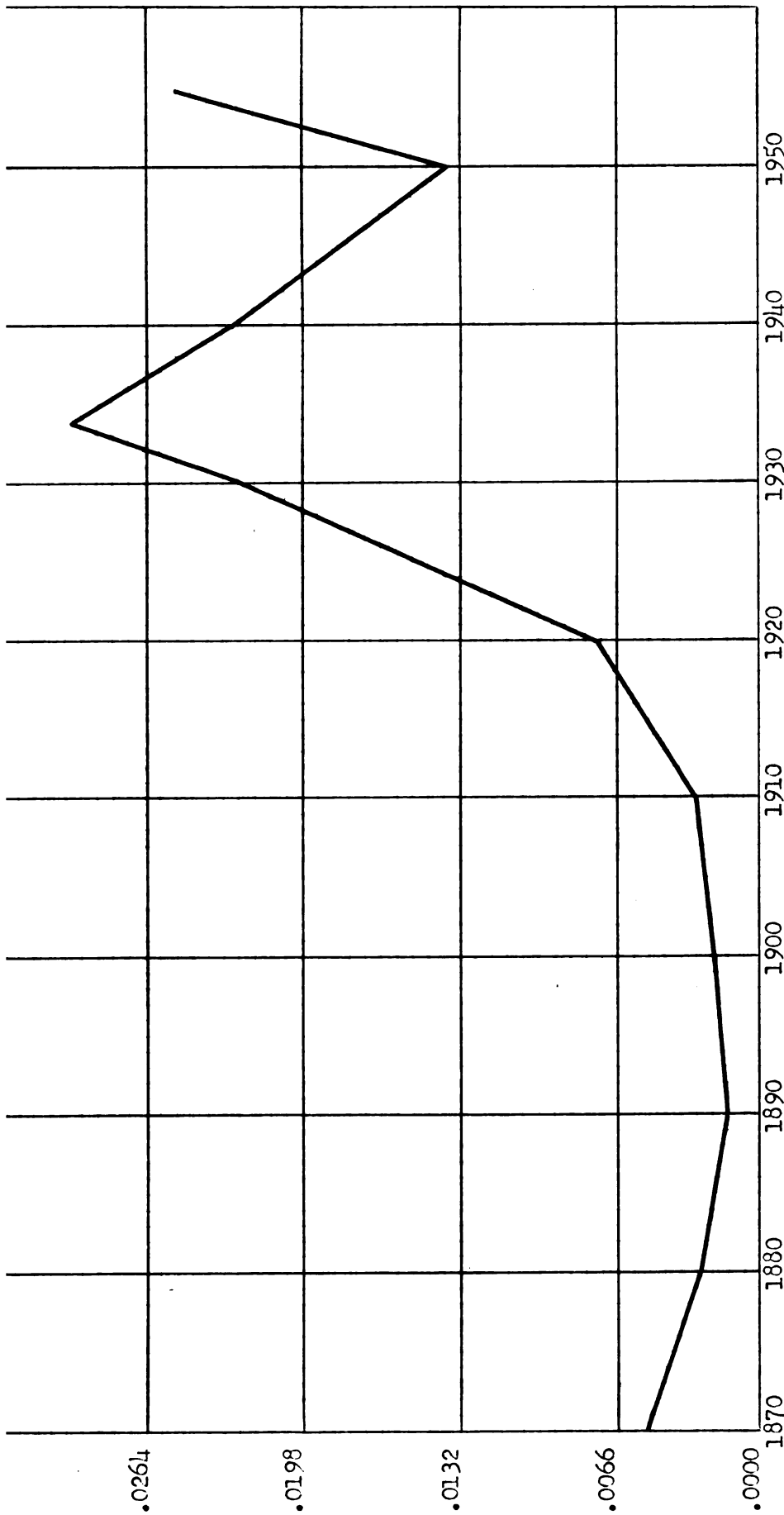


FIGURE 2

RATIO MICHIGAN VALUATION TO SCHOOL BOND DEBT

1870 - 1955

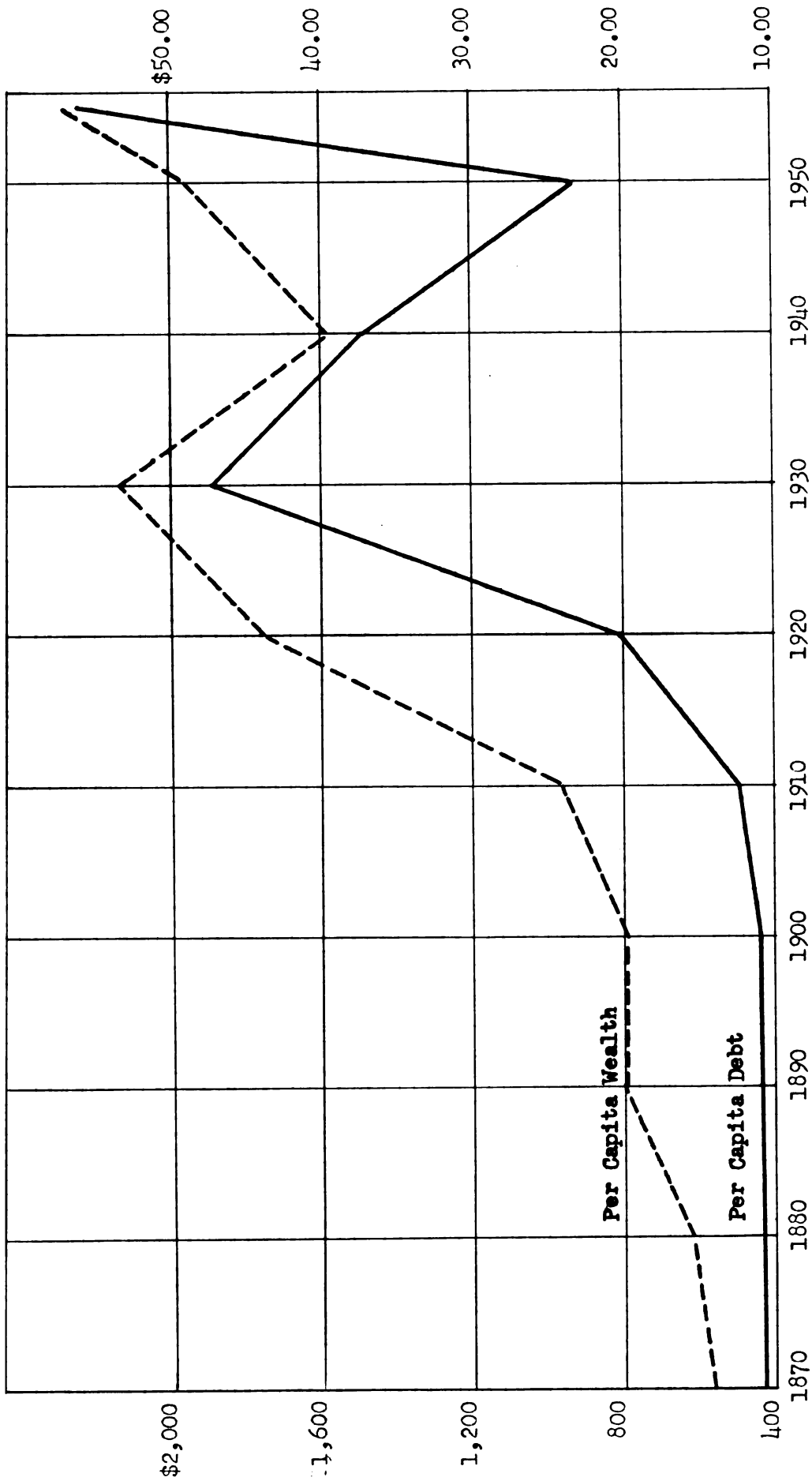


FIGURE 3

MICHIGAN SCHOOL BOND DEBT TO VALUATION -- PER CAPITA COMPARISON

1870 - 1955

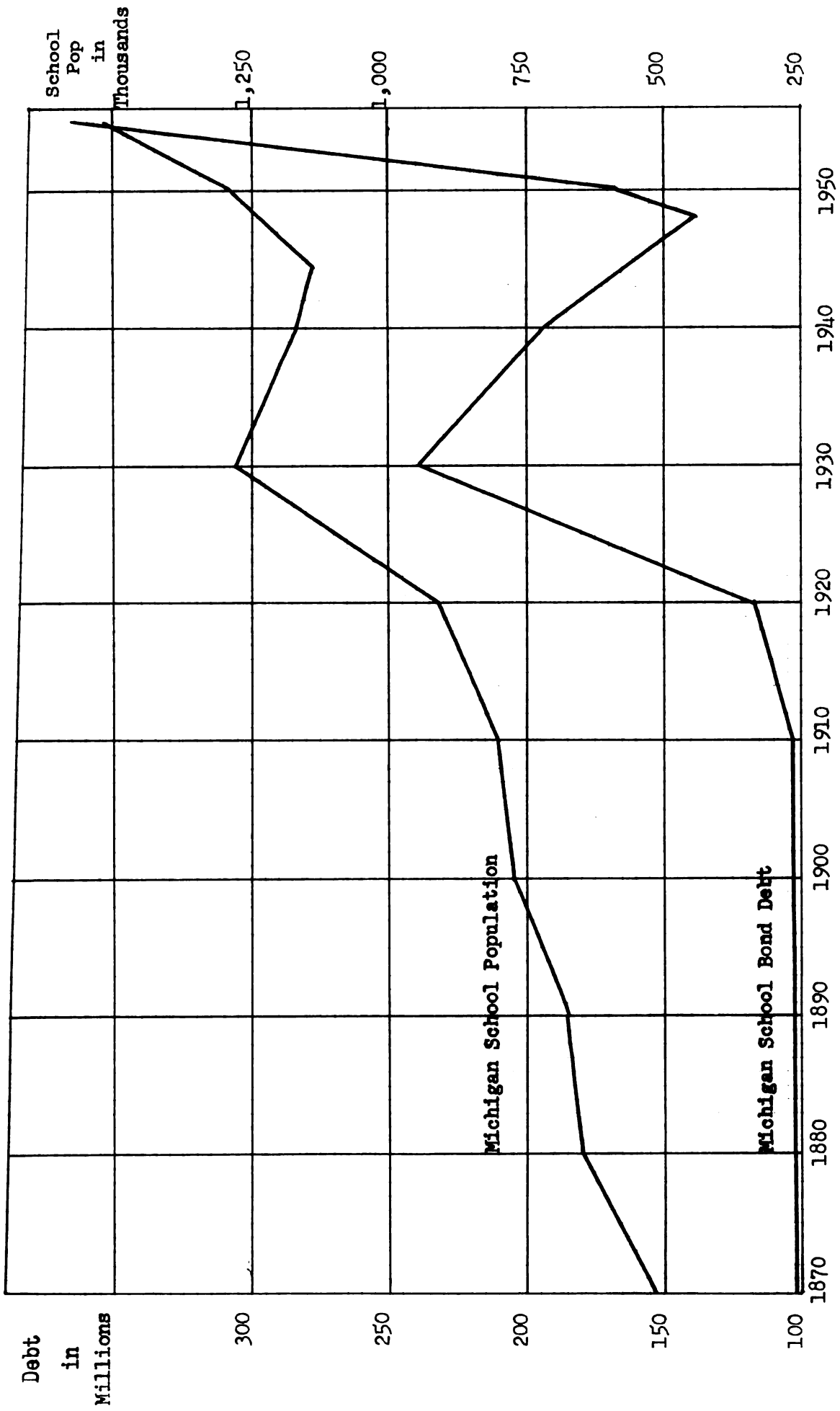


FIGURE 4

RELATION OF SCHOOL BOND DEBT TO SCHOOL POPULATION

1870 - 1955

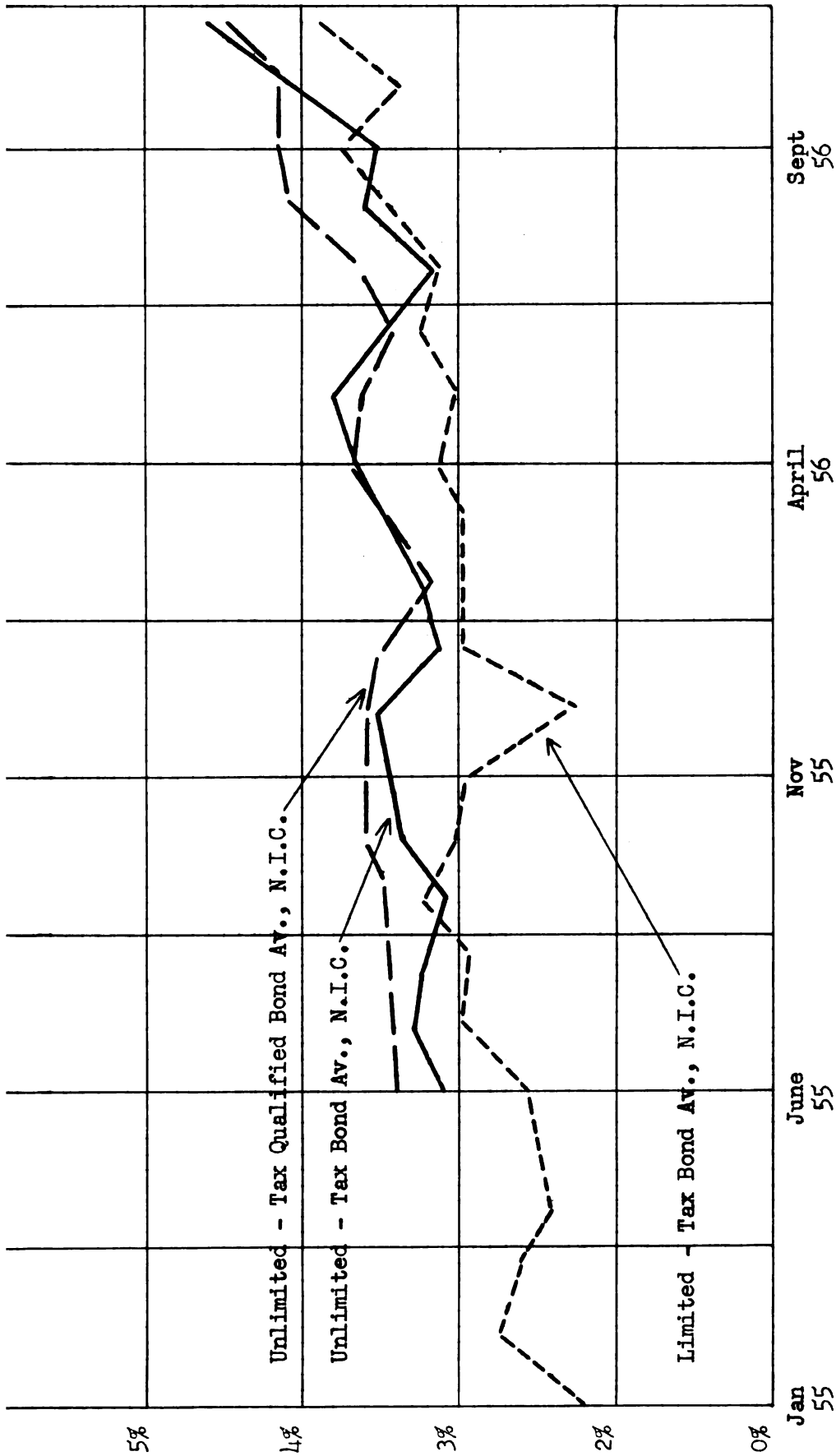


FIGURE 5

LTS., ULTD., UTQ., BONDS -- AVERAGE NET INTEREST COSTS

JANUARY 1955 to JANUARY 1957

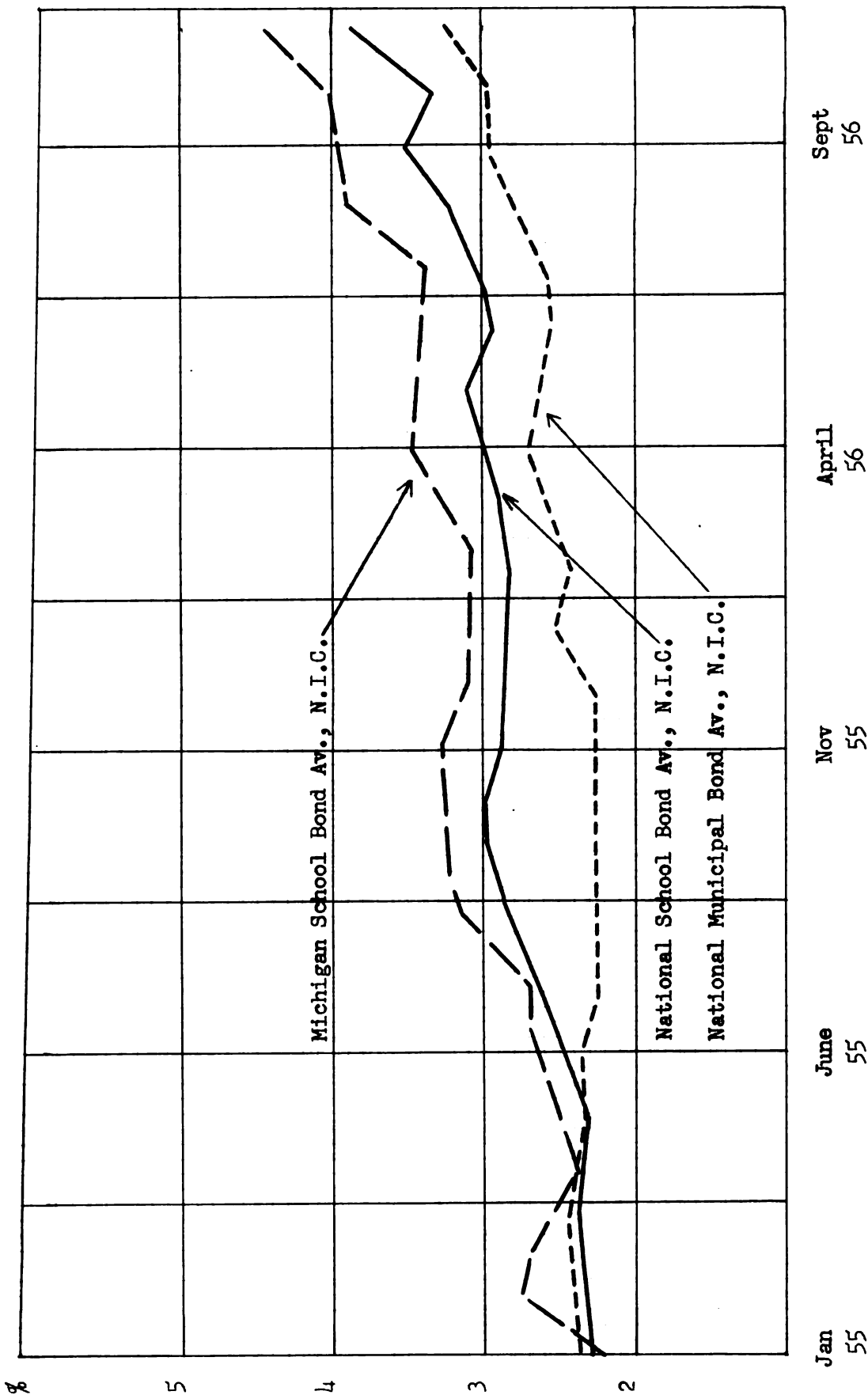


FIGURE 6

MICHIGAN SCHOOL BOND, NATIONAL MUNICIPAL BOND, NATIONAL SCHOOL BOND

COMPARISON OF AVERAGE NET INTEREST COST

JANUARY 1955 to JANUARY 1957

Date DueDemco-293

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