MEASUREMENT OF SCHOOL REVENUE EQUITY IN THE STATES OF ILLINOIS, MICHIGAN, AND KANSAS

by

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1975

ACKNOWLEDGMENTS

The writer wishes to express his sincere appreciation to Dr. G. Alan Hickrod, Chairman of the Dissertation Committee, for his encouragement, guidance, and assistance, and to the other members of the dissertation committee, Dr. Ben Hubbard, Dr. Douglas Poe, Dr. Vernon Pohlmann, and Dr. Gary Ramseyer for their assistance in critiquing the study.

Further appreciation is extended to Senator Gilbert Bursley and his assistant, Mr. Douglas Smith, in Michigan; Senator Joseph Harder and Director of School Finance and Statistics of Department of Education, Mr. Dale Dennis in Kansas; Assistant Director of the Finance and Claims Section, Mr. Robert Pyle in Illinois; and Research Assistant, Miss Susan Wiley in the Intergovernmental Relations Committee of the National Conference of State Legislatures in Washington, D.C. for their support in providing the data essential to the study.

Encouragement and support for this study was also provided by Dr. John J. Callahan and Dr. William Wilkin of the Legislator's Education Action Project (LEAP) of the National Conference of State Legislatures, Washington, D.C.

The writer is also indebted to Mr. Ramesh Chaudhari for his assistance in data transformation and to Mr. Terry Fry for his painstaking assistance in reviewing the study.

In addition, the writer wishes to express a special thanks to his wife, Meredith, for her encouragement, without which the study could never have been completed.

T. W. C. Y.

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CHAPTER I

THE PROBLEM AND ITS BACKGROUND

Statement of the Problem

The purpose of this study is to investigate to what degree school revenue equity has been improved after the adoption of new state aid funding systems in the states of Illinois, Michigan, and Kansas.

Clarification of the Problem Statement

The primary purpose of this study is to investigate to what degree school revenue equity has been improved by changing the state aid funding system from a foundation system to a power equalization system in 1973 in the states of Illinois, Michigan, and Kansas.

Definition of Terms

1. School Revenue for Operational Education Program

This is the sum of the dollar amount of the local revenue and the general state aid spent for school operational purposes.

2. General State Aid

This is the portion of school revenue for school operational purposes toschool districts which are qualified to receive financial assistance from the state. Note that general state aid does not include any state aid for categorical programs.

3. Local Revenue

Local revenue is derived from local resources. In both Illinois

and Michigan, local revenue is the local property assessed valuation times local property tax rate for school operating expenses. In Kansas, local revenue comes from four sources: (1) property tax levy for school operating expenses, (2) district receipts in the preceding school year under PL 874, (3) district's share of the two-mill county foundation tax levy, and (4) district's share of the intangible tax.

4. District Wealth

District wealth shall be defined, for the purpose of this study, in terms of the parameter which is specified in the state grant-in-aid system. In both Illinois and Michigan, district wealth is a figure equal to the adjusted assessed valuation of local school district's properties which are taxed for school operating expenses purpose. In Kansas, district wealth is a figure equal to the sum of the adjusted valuation of property of a district and the taxable income within the district in the year for which the most recent such valuation and income figures are available.

5. Adjusted Assessed Valuation

This is the total dollar amount of the local property valuation of a district as determined by assessment and application of multipliers, and provides a basis for levying property taxes.

6. Operating Tax Rate

The operating tax rate is the tax rate exerted by local school districts for the basic educational fund or funds. The operating tax rate is usually employed to calculate state aid in Illinois and Michigan. In Kansas, local effort rate, instead of operating tax rate, is used in the

calculation of state aid.

7. Local Effort Rate

Local effort rate is used in Kansas in the calculation of state aid for the school year after 1973-74. Local effort rate is 1½ percent of quotient of local school district budget approved by the state board divided by state norm budget.

8. Educational Need Unit

Education need unit shall be defined, for the purpose of the study, in terms of whatever parameter is specified in the state grant-in-aid system for the calculation of state aid in the particular state. In Illinois, TWADA (Title I weighted average daily attendance) is used as a basic unit of education need. In Michigan the basic unit of education need is state pupil membership. In Kansas, the basic unit is district enrollment.

9. Title I Weighted Average Daily Attendance (TWADA)

In the present Illinois' state aid funding formula, weighted average daily attendance (WADA) is weighed by Title I concentration ratio which is the district's percent of Title I eligibles divided by the state average percent of Title I eligible. TWADA then is the sum of district's WADA and 0.375 Title I eligible times concentration ratio. A district with twice the state average percent of Title I eligibles is limited to a maximum weighting of 0.75 per Title I pupil.

10. Equity

The definition of equity is different from that of equality. The principle of equality asserts that the same amount of school revenue should be available to each student within a state. The principle of

equality fails to take into consideration need differentials among the students. Title I students, for example, would be more expensive to educate than would the regular students. Hence, Title I students, in Illinois, are weighted heavier than the regular students when state aid is computed. The principle of equity, however, asserts that the same amount of school revenue should be available to each educational need unit. Alternatively, the principle of equity suggests that school revenue per educational need unit should not be a function of district wealth. Note that the study is not limited to the first form of equity, but rather includes both of them. Operationally, these two forms of equity can be defined, for the purpose of the study, in terms of the criteria of permissible variance and fiscal neutrality. The criteria of permissible variance rests on the assumption that equalization of educational opportunity requires a narrowing of the variation in the levels of school revenue per educational need unit among school districts within a state. The criteria of fiscal neutrality regards the nature of school revenue distribution and asserts that school revenues per educational need unit should not be a function of district wealth, but rather of the wealth of the state as a whole. The measurement of these two criteria will be described in the section on "Evaluative Criteria of School Revenue Equity."

Scope of the Study

This study is limited to the states of Illinois, Michigan, and Kansas, and confined to the years 1972-73, 1973-74, and 1974-75. There are three reasons to choose these three states: (1) they changed their school finance system from foundation program to power equalization

program in the same year--1973; (2) it is likely there will be a demand for more evaluative studies of state fiscal program in several states and a prototype of evaluation of school financing system might be needed; and (3) through a reasonable effort, appropriate data can be obtained with the help of Senator Bursley in Michigan, Senator Harder in Kansas, Mr. Robert E. Pyle (Assistant Director, Finance and Claims Section) in Illinois, and from the Intergovernmental Relations Committee National Conference of State Legislatures. The study centers around the question of equity of school revenues which include general state aid and local revenue derived from property taxes. Note that school revenue defined in this study includes only the operating costs of public schools. Any state categorical aid and federal categorical aid will not be considered. The exclusion of the revenue for categorical programs from this study is based on the fact that none of the court decisions, as yet, have considered the equity problem in financing categorical programs.

Assumptions

It is assumed that the Supreme Courts in the states of Illinois, Michigan, and Kansas, as well as in other states, will continue to be asked to render decisions concerning equity problems in financing elementary and secondary education.

It is assumed that at least one of the purposes of state financing system reform in 1973 in the states of Illinois, Michigan, and Kansas was to narrow the disparities of school revenue among school districts and to move the states toward the goal of fiscal neutrality.

The Background and Rationale for the Study

Introduction. Many individuals accept as a fact that equity is one of the many objectives of state grants-in-aid to local school districts for elementary and secondary education. Whether present state aid funding systems achieve this objective is open to question. In August 1972, the Supreme Court of California in the case of Serrano vs. Priest held that the State of California system of financing local school districts was unconstitutional on the basis of facts in the plaintiffs' complaint when they alleged that disparities in property tax base which characterized California's financing of its public schools denied the equal protection of the laws assured by the fourteenth amendment of the United States' Constitution.[1] Since the Serrano decision, courts in a number of states, such as New Jersey, Michigan, and Kansas, have held that their state financing systems for public schools are equally unconstitutional.[2] At least eleven states have changed their systems of public school finance to provide a more equal opportunity for their students.[3] The change of state financing systems for public schools, therefore, is a timely and important phenomenon. This change should not go unevaluated if the achievement of equity is to be accomplished. Thus, the purpose of this study is to investigate to what degree school revenue equity has been improved by the adoption of a new state aid

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[1]Serrano v. Priest, Superior Court of the State of California for the County of Los Angeles, No. 938, 254. Memorandum Opinion re intended Decision (1974).

[2]Norton W. Grubb, "The First Round of Legislative Reforms in the Post-Serrano World," Law and Contemporary Problems 38 (Winter-Spring 1974): 459.

[3]Ibid., 459-492.

funding system in the states of Illinois, Michigan, and Kansas.

Sources of School Revenue. Nationally, over half of the school revenue was raised from local resources in the 1971 fiscal year. In the same year, a little more than 40 percent of the total revenues available to public schools was provided by state government and only seven percent by the federal government. In Table 1, ten year trends of percentages of revenue received from federal, state, and local sources for public education during the period of 1961-71 are documented.[4] From the table, it reveals that the state share has been increased from 38.7 percent to 40.9 percent and the local share declined from 56.9 percent in 1961-62 to 52.0 percent in 1971-72. The National Educational Association provided the data for the percentage of total educational funds for the school from the states. It showed that state revenues accounted for as much as 87 percent of total educational revenue in Hawaii and as little as 8.5 percent in New Hampshire.[5]

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[4]Commission on Alternative Designs for Funding Education, Financing the Public Schools: A Search for Equity (Bloomington, Indiana: Phi Delta Kappa, 1973), p. 35.

[5]Roe L. Johns, "The Development of State Support for the Public Schools," in Status and Impact of Educational Finance Programs, ed. by Floridal Johns, Roe L., Kern Alexander, and Stollar, Dewey H. (Gainesville, Florida: National Educational Finance Project, 1971), p. 22.

TABLE 1

PERCENTAGES OF REVENUE RECEIVED FROM FEDERAL, STATE, AND LOCAL SOURCES FOR PUBLIC SCHOOLS, 1961-71

School Year	Federal	National State	Local
1961-62	4.3	38.7	56.9
1962-63	3.6	39.3	57.1
1963-64	3.7	40.0	56.3
1964-65	3.8	39.7	56.5
1965-66	7.8	39.1	53.1
1966-67	7.9	39.1	53.0
1967-68	8.8	38.5	52.3
1968-69	7.4	40.0	52.6
1969-70	7.2	40.9	51.8
1970-71	7.2	40.0	52.8
1971-72	7.1	40.9	52.0

Source: Commission on Alternative Designs for Funding Education, Financing the Public Schools: A Search for Equity (Bloomington, Indiana: Phi Delta Kappa, 1973), p. 35.

The estimated combined state, local, and federal revenue for the Illinois common schools during the 1974-75 school year was $3.6 billion. Approximately 1.8 billion (49.5%) was derived from local revenue, and federal efforts amounted to about $212 million (5.8%) of the combined

state, local, and federal fiscal efforts.[6] Local contributions mainly came from real property and corporate personal property taxes.

As Table 2 shows, the relative importance of the various levels of government in Illinois has changed substantially over the previous nine years, although the state share has increased its importance in financing common schools since 1966-67, the finance of public schools is still heavily dependent upon local resources.

TABLE 2

STATE, LOCAL, AND FEDERAL RECEIPTS OF FUNDS FOR THE COMMON SCHOOLS DURING THE PERIOD 1966-67 THROUGH 1974-75
($ in millions)

Year	State	Percent State	Local	Percent Local	Federal	Percent Federal	Total
1974-1975	$1,626.3	44.70	$1,800.0	49.48	$211.9	5.82	$3,638.2
1973-1974	1,374.0	41.41	1,736.0	52.32	208.0	6.27	3,318.0
1972-1973	1,160.3	36.72	1,808.4	57.23	191.2	6.05	3,159.9
1971-1972	995.7	37.42	1,508.6	56.70	156.5	5.88	1,660.8
1970-1971	954.7	39.61	1,301.4	54.00	154.0	6.39	2,410.1
1969-1970	787.0	30.74	1,651.4	64.51	121.6	4.75	1,560.0
1968-1969	516.6	27.94	1,228.3	66.42	104.3	5.64	1,849.2
1967-1968	419.9	27.13	1,230.0	67.84	91.1	5.03	1,813.0
1966-1967	368.6	25.04	1,014.1	68.89	89.4	6.07	1,472.1

Source: State of Illinois, Bureau of the Budget, State, Local, and Federal Finance for Illinois Public Schools in 1974-75 (Springfield, Illinois: The Office of the Superintendent of Public Instruction), p. 4.

[6]State of Illinois, Bureau of the Budget, State, Local and Federal Finance for Illinois Public Schools in 1974-75 (Springfield, Illinois: The Office of the Superintendent of Public Instruction), p. 1.

State Grant-In-Aid

An increasing share of state aid is allocated in some manner intended to minimize the efforts of local resources on the inequity of expenditure level for educational program. At the turn of the century, Cubberley was first particularly concerned with this inequality of educational opportunity and programs among school districts. Through his work, he found that the obvious reasons for inequity was the fact that local financial capacity to support schools varied from one district to another. He noted that educational expenditures and financial capacity to support education were positvely correlated. Hence, he concluded:

> Any attempt at the equalization of the opportunities for education, much less any attempt at equalizing burden, is clearly impossible under a system of exclusively local taxation. Some form of general aid is a necessity if anything like common advantages are to be provided for all.[7]

At his best attempt, Cubberley was to seek a plan of state aid distribution that might possibly reduce the financial inequity among school districts. A number of alternatives were considered:

1. Appropriation based on the amount of taxes paid.
2. Appropriation based on total population of the district.
3. Appropriation based on school census.
4. Appropriation based on the average membership of the district.
5. Appropriation based on average daily attendance of the district.
6. Appropriation based on the number of teachers of the district.[8]

Cubberley believed that alternatives 1 through 4 were inferior. The combination of aggregate daily attendance and teacher employed criterias were viewed as a best possible alternative, because this combination would take both effort and need into consideration.

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[7]Charles S. Benson, The Economics of Public Education (Boston: Houghton Mifflin Company, 1968), p. 157.

[8]Ibid., p. 158.

The basic distribution method of state aid suggested by Cubberley was viewed as a flat grant approach, which has been receiving a great deal of criticism. The basic criticism was that, while the purpose of the plan was to provide greater equity of treatment it probably increases, rather than decreases, inequity. This kind of criticism was initially made by Strayer and Haig. In 1923, Strayer and Haig noticed the plan's inequality and stated that:

> Approximately one-half of the state aid is entirely unaffected by the richness of the local economic resources back of the teacher, and the portion which is so affected is allocated in a manner which favors both the very rich and the very poor localities at the expense of those which are moderately well off.[9]

Strayer and Haig thus formulated a plan for a state's distribution of school funds, which placed primary emphasis on equal opportunity in a fiscal sense. It is said that the Strayer-Haig plan is intended to allocate state aid in inverse proportion to local school fiscal capacity in the following manner. A floor or foundation level of educational expenditure per unit is determined through a legislative process. The minimum local contribution is the product of the mandatory local tax rate times the local tax base--property assessed valuation. The state aid is the difference between the foundation level and the local share. Thus, in the foundation program, there are two important constants: a foundation level of expenditure per unit and the mandatory tax rate.[10] State aid can be directed to poorer districts under this plan by increasing

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[9]G. J. Strayer and R. M. Haig, The Financing of Education in the State of New York (New York: The Macmillan Co., 1923), p. 162, in Elchanan Cohn, Economics of State Aid to Education (D. C. Heath & Co., 1974), p. 17.

[10]Alan G. Hickrod, et al., Definition, Measurement, and Application of the Concept of Equalization in School Finance, 1972, Illinois Office of Education, Springfield, Illinois. (available as document ED 078 551 in the Eric systems).

the magnitude of both constants. Unfortunately, what tends to happen in many states is that the mandatory tax rate is not increased at the same rate as foundation level of expenditure per unit.[11]

The third type of state aid distribution plan, called the percentage equalizing plan, emerged from Updegraff's concept of efficiency in the year 1922. The plan placed relatively greater emphasis on the concept of local effort for the sake of reducing variation in per pupil expenditures among school districts. In this plan, the state's role is to stimulate the local school districts to provide the desirable educational service. The percentage equalizing plan has the advantage of having only one constant, i.e., the percentage which determines the amount of state and local contributions in the district of average wealth. As this constant is lowered, more funds are directed toward poorer districts. When the parameter is raised, less funds are provided to poorer districts.[12] In many states, the percentage equalizers are accompanied by legislation which allocates a fixed amount of state aid to the school districts regardless of local wealth. This is equivalent to a flat grant and has some anti-equalization effects.[13]

The "resource equalizer" or "district power equalizer" is the fourth type of state aid distribution method. This method was described by Professors Coons, Clune, and Sugarman in 1970.[14] Systems like this had existed in Wisconsin and Utah for many years, and in fact the basic idea is probably British in origin and goes back to at least 1917. The

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[11]Ibid., p. 43. [12]Ibid., p. 44. [13]Ibid., p. 45.

[14]Elchanan Cohn, Economics of State Aid to Education (Massachusetts: D. C. Heath & Company, 1974), p. 35.

main purpose of this method is to provide the state funds to local districts on the basis of tax rate for educational purpose. That is, the expenditure is not to be a function of local wealth but rather a function of the tax effort exerted by local school districts. The variation of tax rate will hopefully reflect the local preference for educational programs. In many states, the resource equalizer always has one constant which is the guaranteed valuation. The higher the guaranteed valuation is set, the more state aid is distributed to poor school districts relative to the rich school districts. The lower the guaranteed valuation, the less state aid to poor schools relative to the rich school districts. Thus, whenever the local district wealth, defined in terms of property assessed valuation, is inputted into the calculation, the purpose of the plan will be to minimize the local wealth disparity effect on educational expenditure disparity.

The general types of state aid distribution programs were discussed above. Thomas L. Johns, in 1972, provided a summary table of states' funding programs.[15] From his summary table, it can be seen that a majority of the contiguous states used some modification of the Strayer-Haig Minimum Foundation program in the school year 1971-72. These included most of the southern and western states. In the midwest, Illinois, Indiana, Michigan, Missouri, and Kansas also used this plan. Johns' data also shows that ten states operated on flat grant programs, six states on percentage equalizing programs, three states on resource equalizers, and Hawaii still operated on full state funding.

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[15]T. L. Johns, Public School Finance Programs (Washington, D.C.: U.S. Government Printing Office, 1969).

Although many states' grant-in-aid for local school districts try to equalize educational expenditure per pupil among districts, the degree of equalization actually achieved is considerably less than might be expected.[16]

Legal Challenge to the School Finance System

Many states' school finance systems have been under serious legal attack because of their alleged denial of equal protection guaranteed by the Fourteenth Amendment of the Federal Constitution and similar guarantees in state constitutions. This denial of equal protection of the laws resulted from the current financing system producing substantial disparities among school districts in the amount of revenue available for education and making the quality of a child's education depend upon the wealth of his local school district. The states affected are Arizona (Hollins v. Shofstall),[17] New Jersey (Robinson v. Cahill),[18] Michigan (Milliken v. Green),[19] Minnesota (Van Dusartz v. Hartfield),[20] Kansas (Caldwell v. The State of Kansas),[21] Wyoming (Sweetwater County Planning

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[16]R. L. Johns and R. G. Salmon, "The Financial Equalization of School Support Programs in the United States for the School Year 1968-69," in Status and Impact of Educational Programs, ed. by R. L. Johns, K. Alexander, and D. H. Stollar (Gainsville, Florida: National Educational Finance Project), pp. 119-91.

[17]Hollins v. Shofstall, No. C-253652, Super. ct., Maricopa Co., Ariz. (decided June 1, 1972).

[18]Robinson v. Cahill, 62, N. J., 473, 303 A. 2d 273 (1973).

[19]Milliken v. Green, 203 N. W. 2d 457 (1972).

[20]Van Dusartz v. Hartfield, 334 F. supp. 870 (D. Minn. 1971).

[21]Caldwell v. Kansas, No. 50616, P. C. Johnson County (decided August 30, 1972).

Committee for the Organization of School Districts v. Hinkle),[22] Texas (Rodriguez v. San Antonio Independent School District),[23] and California (Serrano v. Priest).[24] Of these, the Texas, New Jersey and California cases are perhaps the most important as landmark cases. Each will be briefly described below.

In the case of San Antonio Independent School District v. Rodriguez, the United States Supreme Court overturned the lower court decision and held that the Texas financing system did not disadvantage any suspect class and did not violate the Equal Protection Clause of the Fourteenth Amendment. The majority of the court in Rodriguez held the belief that the Texas financing system assured a fundamental education for every child and did encourage participation in and significant control of each district at local level. The majority also believed that the existence of substantial revenue disparities in the manner in which the state's purpose is achieved is not alone a sufficient reason for striking down the entire system. In addition, it is important to note that the Rodriguez majority concluded that the United States Supreme Court did not prohibit the states from creating school finance systems in which heavy reliance on local property taxes results in wealthy school districts providing high quality educational program and tax-poor districts offering inferior ones.[25] In its implication, it is indicated that the court was not anxious

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[22]Sweetwater County Planning Comm., v. Hinkle, 491 P. 2d 1234 (Wyo. 1971).

[23]San Antonio Independent School District v. Rodriguez, U.S. Supreme Court, No. 71-1332, March 21, 1973.

[24]Serrano v. Priest, No. 938-254, S. Ct. Cal. (decided Dec. 1971).

[25]Stephen R. Browning, "School Finance Litigation in a Post-Rodriguez Era," Planning and Changing 5 (Summer 1974):71.

to deal with matters concerning how state and local revenues are raised and distributed. This would leave the door open for each individual state to deal with the issue of "equality of educational opportunity" in terms of their respective state constitutions.

The second important case is Serrano v. Priest. On August 30, 1971, the California Supreme Court decided that the California state financing scheme to local school districts was unconstitutional on the basis of facts alleged in the plaintiffs' complaint. In reaching the decision, the court gave three reasons:

1. The education is viewed as a fundamental interest in the state of California. Since the school financing system touches upon this basic interest, it thus is subjected to the judicial scrutiny.

2. The education as a fundamental interest cannot be conditioned on the wealth of local school districts which is defined as a suspect classification for legislative discrimination.

3. The current school financing system is not necessary to the attainment of any compelling state interest.[26]

After the decision made by the trial court, the Supreme Court of California further held that the state's school finance laws were unconstitutional in making the quality of a child's education dependent upon the wealth of his local school district. This case was also then remanded for further trial by the California Superior (trial) Court for the purpose of fact finding. The trial of this case commenced on December 26, 1972. During the progress of the trial, California legislation approved a bill (SB 90) which made changes in the California public school financing system.

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[26]C. O. Fitzwater, "Impact of the Serrano Decision," in The Courts Seek Fiscal Neutrality in Education, edited by Gene D. Watson, the first in a series of contemporary monographs by the publishers of Planning and Changing.

AB 1267 followed SB 90. Under SB 90 and AB 1267, the State of California continued the foundation program approach but with some modifications. The first essential change was to increase the equalization aid (i.e., increase the foundation level). The amount was increased from $355 to $765 for elementary students and from $488 to $950 for high school students. The second fundamental change was to increase the minimum mandatory tax rate in order to qualify for state aid. The new minimum tax rate for elementary school districts was $1.00, for the high school districts, $.80, and for the unit school districts $1.80 per $100 assessed value per pupil. The third essential element under SB90 (Senate Bill 90) and AB 1267 was the change made in the computational tax rates. The rate for elementary students was increased from $.90 to $2.23, the high school rate was raised from $.75 to $1.64, and the unit school rate was raised from $1.65 to $3.87.[27] A major question before the trial court was to determine the applicability of the Serrano court's opinion in 1971 to the California public school financing system as amended by the passage of SB 90 and AB 1267.[28]

On April 10, 1974, the California trial court gave its reaction to the present California school financing system. In its decision, the court pointed out again the following objectionable features of the school financing system from an equal-protection of the laws standpoint:

1. The basic aid payments of $125 per pupil to the high-wealth school district;

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[27]Serrano v. Priest, Superior Court of the State of California for the County of Los Angeles, No. 938, 254. Memorandum Opinion re Intended Decision (1974), pp. 11-13.

[28]Ibid., p. 15.

2. The right of voters of each school district to vote tax overrides and raise unlimited revenues at their discretion;

3. Disparities between school districts in per pupil expenditures, apart from the categorical aids special needs programs, that do not reduce to insignificant differences, which mean amounts considerably less than $100 per pupil within a maximum period of six years; and

4. Variations in tax rates between school districts that are not reduced to nonsubstantial variations within the same maximum period set forth in subparagraph (3) for the equalization of per-pupil expenditure levels.[29]

The court allowed six years as a maximum period for the gradual elimination of discrimination in per pupil expenditures.[30] However, the court did not discuss the previous matter of horizontal tax payer inequity--equal treatment of equals. This matter, in the Serrano opinion, seems to say that if the taypayers in one school district are required to pay higher tax rates than taxpayers of another school district in order to achieve equality of educational opportunity for their children, they are denied equal protection of the laws. This issue is very crucial because court orders to equalize expenditures could be satisfied even though greater disparities in local tax rates resulted. If such is the case, the shape of distribution of expenditures per pupil can be a skewed one. But according to Serrano, the distribution of expenditure per pupil can no longer be a function of wealth defined in terms of property assessed valuation. Instead, it can be a function of tax rate.

Robinson v. Cahill is another important case. The case was first appealed from the New Jersey trial court. The court upheld that the New Jersey school finance system was not constitutional, but on different

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[29]Ibid., pp. 102-103.

[30]Serrano v. Priest, p. 103.

grounds from the other two cases. In reaching its opinion, the court said that an education which is thorough and efficient must be understood to embrace that educational opportunity which is needed in a contemporary setting to equip a child for his role as a citizen and as a competitor in the labor market.[31] This opinion sounds much like an achievement standard, and the court had found that in some New Jersey school districts both input and output were inadequate. In addition, the trial court found that the taxpayers in poorer school districts were forced to pay higher tax rates than taxpayers in relative wealthy school districts; this is a denial of the tax uniformity provision of the New Jersey constitution as well as the state's equal protection clause.[32] However, the case went to the New Jersey Supreme Court, and the Supreme Court upheld the decision that the New Jersey school financing system was unconstitutional, but rejected the trial court's decision of the state constitution's tax uniformity provision on the ground that the uniform tax rate was not required when the state delegated fiscal responsibility to the local school districts. The above court decisions focus on the expenditure side of the problem. Little has been said about the likelihood of other state courts across the nation declaring their school finance systems unconstitutional on the basis of taxpayer inequity.

School Finance System Reform

A number of states, Colorado, Florida, Kansas, Maine, Michigan, Montana, Utah, Wisconsin, and Illinois (the Florida legislature, in its

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[31]Browning, p. 75.

[32]Ibid., p. 76.

most recent session, drastically revised its new finance legislation, knocking out the DPE provision)[33] have recently enacted statutory programs which attempt to distribute state aid on the basis of district power equalizing (DPE) formula. Of these, Maine, Kansas, Michigan, Colorado, and Illinois have adopted new approaches to resource equalization, and each is briefly explained below.

Maine is one of the states to take a relative dramatic step forward to a formula which, when its changes took effect in 1974-75, were designed to have an impact on the poorest and lowest expenditure school districts. In its new reform, Maine equalized a 2.5 mill discretionary local leeway with a guaranteed yield provision. In addition, a limit was placed on further expenditure level increases by those higher expenditure districts so that, eventually, expenditures per pupil would be equalized.[34]

Kansas also changed its traditional approach to a system which guarantees a specified level of expenditure per pupil for a particular level of local tax effort.[35] There is a difference between Maine's school finance system and Kansas' school finance system. In Kansas, there is no provision provided by the law for the state to recapture the excess of local yields, but the guarantee level was set sufficiently high so that only a small percentage of the school pupil enrollment is in nonparticipating school districts.[36]

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[33]Norton W. Grubb, "The First Round of Legislative Reforms in the Post-Serrano World," Law and Contemporary Problems (Winter-Spring, 1974): 463.

[34]Thomas L. Johns, "School Finance Reform in 1973--An Overview," Planning and Changing 5 (Spring 1974):45.

[35]Ibid., p. 45.

[36]Ibid., p. 46.

Michigan, in the midwest, abandoned its traditional foundation program approach as did Kansas. The state added an "equal yield" formula in its new school finance system. The law in Michigan has no recapture provision but the state guarantee was also set very high so that fewer school districts were excluded.[37]

In Colorado, the law has provisions to guarantee $25 per mill per student. Each school district's permissable tax rate depends on its previous budget level plus a variable inflation and leveling-up percentage, and there is no recapture provision included in the law.[38]

In Illinois, the new state funding system is a hybrid, because it retains the previous foundation program, but gives an important option for poorer school districts. This option is a resource equalizer plan which includes the operational tax rate as a multiplier. During 1974-75, 80 percent of all Illinois districts were reimbursed under the Resource Equalizer plan; 95 percent of all high school districts, 81 percent of all elementary districts, and 74 percent of all unit school districts were reimbursed under the Resource Equalizer plan. Also, approximately 93 percent of Illinois pupils are enrolled in resource equalizer school districts.[39]

All of the DPE systems have their strengths and weaknesses. Professor Benson provides some important insights into the weaknesses of DPE systems. The following passage is worth quoting in some detail:

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[37]Ibid., p. 46.

[38]Thomas L. Johns, p. 47.

[39]State of Illinois, Bureau of the Budget, p. 7.

> A very important difference between FSA and DPE plans is that DPE allows, indeed encourages, the perpetuation of the difference in connection to the needs or desires of school children who are, after all, primary (though nonvoting) clients of an educational system. DPE offers no more protection to children from apathetic or selfish adults than our present system does. It may break the connection between quality of education and size of local tax base, though, in the sense that high and low spending districts can no longer be generally identified by their taxable wealth. But at the same time, DPE allows districts to trade local tax relief (a benefit to resident adults) for financial starvation of the local schools. Thus, if children are protected from the uneven distribution of locally taxable wealth, they are nevertheless vulnerable to possibly harmful influence of adult taste for educational services.[40]

Benson is also aware that the DPE system has both stimulative and "reward for effort" functions. Under the DPE system, it is more important to stimulate to increase low property tax rates than to stimulate to increase high property tax rates. Professor Hickrod noted that this objection can be partially met by adopting a "curvilinear" or "kinked" DPE system which rewards increases at the low end of the tax rate scale.[41] Hickrod gives some insight into where Illinois might be going next. He stated that

> The present system in Illinois is linear, that is, the same rate of reward holds throughout all tax levels. If the new Illinois DPE system begins to result in a large number of local tax referendums being passed at the upper end of the tax range, then this (kinked DPE system) may be a partial solution. However, local districts may not react very kindly to "changing the rules in the middle of the game."[42]

If the present finance system can encourage most of assessed valuation poorer school districts to raise their tax rate for the

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[40]Charles S. Benson, Paul M. Goldfinger, Gareth E. Hoachlander, and Jessica S. Pers, Planning for Education Reform: Financial and Social Alternatives (New York: Dodd, Mead and Company, 1974), p. 57.

[41]Alan G. Hickrod, "Review of Four New Books in K-12 Finance," Journal of Educational Finance (Summer 1975):147.

[42]Ibid., p. 148.

educational fund, the disparities of educational expenditure among school districts would be closed. The students living at the lower end of the wealth range would be saved by the school finance reform.

Although the DPE system has as its unique nature "reward for effort," the major concern of the present DPE system is still how complete fiscal neutrality (this is the Serrano and Rodriguez criterion) can be achieved and how expenditure (or revenue) per educational need unit can be equitably distributed among the school districts. In order to meet the demands of equity it is necessary to examine the nature of school revenue distribution. With the resultant data, some underlying factors which may affect the movement of state aid financing system toward the goal of equity may be identified. The identification of some causes of revenue inequity will hopefully provide valuable information which will help move the states toward the goal of equity which has been defined in terms of the criteria of permissible variance and fiscal neutrality.

Evaluative Criteria of School Revenue Equity

In keeping with the spirit of Serrano-type decisions, the principle of equity may suggest that an individual's consumption of educational services should not be allowed to differ substantially or, alternatively, that such differences should not bear a strong relation to the local wealth.[43] The study is not limited to the first or the

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[43]Note that the principle of equity here is different from the traditional notions of vertical equity and horizontal equity. This principle of equity is often called "categorical equity," which concerns the equal distribution of these goods and services that are deemed to be "fundamental interests" such as education. Martin S. Feldstein, "Wealth Neutrality and Local Choice in Public Education," The American Economic Review (March 1975):76.

second form of equity, but rather includes both of them. Operationally, these two forms of equity can be defined, for the purpose of the study, in terms of the criteria of permissible variance and fiscal neutrality. The concepts of these two criteria appear to have some significance to state legislatures. These criteria are explained below.

The principle of permissible variance is that there may be allowed to exist only a specified variation in the levels of expenditure per educational need unit between school districts within a state and that this variation reduces with the passage of time. In this concept, no claim is made, however, that all educational need units should have the same amount spent on them or how much variation is permissible although suggestions have included a permissible variation between districts' spending levels of as much as 50 percent and as little as 5 percent. In addition, this concept also has some other weaknesses. First, there is no agreement on what to measure; that is, variance in what (expenditures, service, tax rate-input, achievement test scores-output)? It is believed that much more controversial notions of permissible variance emerge if it becomes apparent that the objective is really a reduction of the variance in some kinds of output measurements rather than a reduction of the variation in various kinds of input measurement.[44] Lacking a good output measurement in the states of Illinois, Michigan, and Kansas, two inputs are selected for the purposes of this study. They are school revenue per educational need unit and property valuation per educational need unit. Secondly, equal school revenue per pupil, irrespective of their educational need, is not

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[44]Elchanon Cohn, Economics of State Aid to Education (Massachusetts: D. C. Heath & Company, 1974), p. 30.

acceptable since pupils differ as to educational needs; however, there is no general agreement on what serves as the unit of educational need. That is, for example, school revenue per ADA, school revenue per TWADA, school revenue per teacher, etc. The units of educational need, for the purpose of this study, shall be those parameters which are used in grant-in-aid formulae. It is assumed for this study that the parameter used in the allocation of state aid in a particular state is the same parameter which accounts for cost differentials of educational need unit (or which the legislature of the particular state has decided is to be cost differentiated). For Illinois, TWADA (weighted average daily attendance with Title I weighting) is used as the unit of educational need. For Michigan, state pupil membership is the unit of educational need. For Kansas, district enrollment is the unit of educational need.

In spite of the weaknesses of the notion of "permissible variance," it still appears to have some intuitive appeal to the courts and to state legislatures and, therefore, will be used in this study.

Another approach to permissible variance is termed "the McCloone approach." This approach is to look at the variance of school revenues for school districts below the median revenue. The focus of this approach, in other words, is on the distribution below the median revenue rather than on the entire distribution. Under this approach, the skewness in the revenue distribution is permissible as long as the variation in the lower end of the distribution is reduced. Philosophically, this approach holds that in educational finance, equity does not necessarily mean reducing the difference between the high and the low expenditures. This approach is very similar to the foundation approach which seeks to reduce the difference by leveling up the expenditures in the areas of low wealth.

Accordingly, this approach holds that the expenditure distribution is permitted to be skewed to the right, but it is not thought to be permissible for the distribution to be skewed to the far left. This particular position is squarely in line with late Professor Paul Morts' defense of "lighthouse school districts" which can lead the others to seek higher quality of educational services, as indicated by Dr. Hickrod.[45]

Both the coefficient of variation and the McCloone approaches to permissible variance are included into the study; that is, a total reduction in variation among revenues and a reduction of variation only below the median. The success of the reforms of 1973 in the states of Illinois, Michigan, and Kansas will be judged on this criterion if a reduction of the variation in school revenues per educational need unit has occurred subsequent to implementation of the reforms.

The second criterion selected is "fiscal neutrality." This criteria arises from the recent litigation regarding the constitutionality of public school finance law. The federal district court for Minnesota specifically stated that the level of spending for a child's education may not be a function of local wealth other than the wealth of the state as a whole.[46] In this statement regarding fiscal neutrality, nothing is said to prevent the level of educational expenditures from being a function of tax rate differences between school districts, or other reasonable and rational factors other than specifically local wealth. This

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[45]Alan G. Hickrod, Thomas Yang, Ben C. Hubbard, and Ramesh Chaudhari, "Measureable Objectives for School Finance Reform: A Further Evaluation of the Illinois School Finance Reforms of 1973" (presented to the 1975 Annual Meeting of the American Educational Research Association, Washington, D. C., April 1975).

[46]Van Dusartz v. Hatfield, 334 F. supp. 870, 872 (D. Minn., 1971).

leads to the dilemma that Stephen Barro has called the ex ante position versus ex post position concerning fiscal neutrality:

> . . . one must choose between ex post and ex ante concepts of fiscal neutrality. The ex post interpretation is that the actual level of educational support must not correlate with wealth. On that basis, a system that resulted in both higher spending and higher tax effort in wealthy districts would not be acceptable. The ex ante formulation is that the ability of a district to support schools should not depend on wealth. This means only that a unit of effort must produce the same support everywhere.[47]

In the notion of ex ante position, a correlation between expenditure and wealth might be still acceptable if the poorer districts prefer the lower tax rates and the wealthier districts prefer the higher tax rates. However, the ex post position strictly holds that regardless of the pricing patterns and educational preferences of rich and poor districts, expenditure must simply never be a function of local wealth on the whole. Since the formulation of ex post position is much more consistent with the criterion indicated in the case of Serrano v. Priest, the state finance system in this study would be evaluated with this ex post position in mind.

Another aspect of fiscal neutrality regards the concept of "fairness" in the distribution of school revenues for elementary and secondary education. Viewed from this second perspective, fiscal neutrality holds that regardless of wealth, or anything else for that matter, students with the same educational needs should receive exactly the same amount of dollars spent for their education. The inclusion of the concept of fairness, plus keeping the ex post notion in mind, leads us particularly toward the use of the Gini index and Lorenz curves in this study.

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[47]Stephen M. Barro, p. 32.

Statistical Design

In the measurement of permissible variance, there are a number of statistical methods which can be used. One method which is selected in this study to measure the variance is "coefficient of variation." That is, the standard deviation divided by the mean and multiplied by 100. The advantage of this particular approach is the standardization of the measurement and hence its appropriateness for comparisons between states with quite different levels of school revenues.

In the measurement of fiscal neutrality, Lorenz curve and Gini Index are used. The Lorenz curve is the technique most commonly used to indicate differences in the degree of inequity of different income distribution. It is a simple graphic device. In its formulation, the school districts of a state would be sorted in ascending order of wealth per educational need unit, then the cumulated percents of aggregate school revenues are plotted arithmetically against the cumulated percents of each district's proportion of the state's educational need units. Gini coefficient (or Gini Index [G]) is a measure of the degree of concentration of the frequency distribution. G is equal to zero if all educational need units receive the same amount of school revenue; G is equal to 1 if all school revenue is concentrated in one educational need unit. G, then, will be between 0 and 1; the smaller the G, the more nearly equal the distribution of school revenue among educational need units.

The Lorenz curve and Gini index method can be modified to net out the effect of local revenues and grant-in-aid systems on the distribution of school revenues. The technique is to place different sources of school revenue against the same cumulated percents of educational need

units receiving that revenue. The changing Gini coefficients would be attributed to the added factor which changed the distribution of school revenue; (i.e., adding state aid to local revenues).

An alternative measure of fiscal neutrality is to use "regression analysis" as suggested by both Michelson and Feldstein. The precise rule of fiscal neutrality can be described in terms of the elasticity of educational spending with respect to the value of local wealth per educational need unit. The log-linear relationship between school revenue per educational need unit and wealth per educational need unit can be established with a regression equation. Complete fiscal neutrality would require the wealth elasticity to be zero. A rating other than zero indicates that, to a certain extent, the school revenue per educational need unit is a function of local wealth per educational need unit.

Another method of utilizing regression analysis to identify the effect of grant-in-aid systems on the movement of states toward the goal of fiscal neutrality is very useful, especially for interstate comparisons. This is called "parallel regression analysis."[48] The technique is to regress two dependent variables which differ from each other by the amount of state aid against the same independent variable--wealth. The logarithm is also used for the transformation of both dependent and independent variables in these two regression equations. The elasticities of dependent variables with respect to the independent variable are examined. The difference between these two wealth elasticities from these two regression equations will reflect the equalizing effect of state aid on the distribution of school revenues.

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[48]J. Miner, Social and Economic Factors in Spending for Public Instruction (New York: Syracuse University Press, 1963).

Summary of Statistical Design

For the purpose of clarity and understanding of the interrelationship between the criteria of evaluation and research techniques employed in this study, the following summary table is provided. This summary table contains two criteria--(1) permissible variance, and (2) fiscal neutrality. Under each criteria, statistical methods and their descriptions, variables used in each statistical technique, and evaluation of the results from statistical analysis are described. For the criteria of permissible variance, two statistical methods are used. They are coefficient of variation and Mcloone Index. The magnitude of coefficient of variation and Mcloone index would be examined to determine the degree of improvement of school revenue equity by adopting the new state aid funding systems in the states of Illinois, Michigan, and Kansas. For the criteria of fiscal neutrality, Lorenz curve, Gini Index, and regression analysis are employed to investigate the school revenue disparities among school districts, the effect of changing the state aid funding system from foundation system to power equalization system in the states of Illinois, Michigan, and Kansas, and the component effect of local revenue on the distribution of school revenue.

TABLE 3

SUMMARY TABLE OF CRITERIA, STATISTICAL METHOD, AND EVALUATION OF THE RESULTS

Criteria	Statistical Method	Description of Statistical Method	Variables	Evaluation
Permissible Variance	Coefficient of Variation	Coefficient of Variation = (Standard Deviation)/Mean	1.District Wealth 2.School Revenue 3.District (Local) Revenue	1. The narrower the coefficient of variation of school revenue per educational need unit, the greater equity is achieved. 2. The greater the difference between the coefficient of variation of school revenue and the coefficient of variation of local revenue, the greater the effect of distribution of state aid on the movement of state toward the goal of equity as defined in terms of permissible variance.
	Mcloone Index	Mcloone Index= Total School Revenue below the Median/Total Deviation from the Median	1.School Revenue	1. The greater the index, the greater the equity as defined in terms of Mcloone type's permissible variance.
Fiscal Neutrality	Lorenz Curve & Gini Index	Gini Index = $\sum_{i=2}^{n}(X_{i-1}Y_i - X_iY_{i-1})$	1.School Revenue 2.State Aid 3.District (local) Revenue	1. The smaller the index, the greater the equity and the less dependence of school revenue distribution on local district wealth. 2. To examine the effect of adopting new state aid funding system on the movement of states toward fiscal neutrality and the effect of distribution of local revenue on the movement of states toward the goal of fiscal neutrality. 3. The greater the difference between the Gini index of school revenue and the Gini index of local revenue, the greater the effect of distribution of state aid on the movement toward the goal of fiscal neutrality.

TABLE 3--CONTINUED

Criteria	Statistical Method	Description of Statistical Method	Variables	Evaluation
	Regression Analysis	School Revenue per educational need unit is a function of district wealth. Local Revenue per educational need unit is a function of district wealth. $\text{Log } Y=a+b_i \text{Log} X_i$	1. School Revenue 2. District (Local) Revenue	1. The smaller the elasticity of district wealth, the greater the equity. 2. The greater the difference between the wealth elasticity on school revenue and the wealth elasticity on local revenue, the greater the effect of distribution of state aid on the movement toward the goal of fiscal neutrality.

Sources of Data

Kansas data for this study was provided by "Intergovernmental Relations Committee National Conference of State Legislatures." However, the supplemental state aid in 1972-73 in Kansas data provided by "Intergovernmental Relations Committee National Conference of State Legislatures" was not included and was obtained from school finance and statistics division in the Kansas Department of Education. Michigan data was provided by the Office of Senator Gilbert E. Bursley, while Illinois data was provided by the Illinois Office of Education.

Three years data were needed for the study. That is, one year before the change of state aid funding system and two years after the change of the system.

Organization of the Study

1. Chapter I contains the problem statement, the general background and rationale of the study, evaluative criterias of revenue equality, and definition of terms.

2. Chapter II contains the review of literature relevant to the study.

3. Chapter II describes the recent development of state aid financing systems in Illinois, Michigan, and Kansas.

4. Chapter IV contains the collection of the data, organization of the data, and statistical design with evaluative criteria.

5. Chapter V presents the statistical findings, summary, conclusions, and recommendation for future research.

CHAPTER II

REVIEW OF LITERATURE

Measurement of school revenue equity has been attempted through the use of various techniques. However, these attempts, in general, involve some economic or financial variables, such as local property assessed valuation, tax rate, state aid for school operating purposes, and school district revenues. School revenue in many states is mainly dependent upon the local resources, which, in turn, are dependent upon local wealth. The disparity of school resources available to school districts causes the disparity of school revenues among them if there exists no higher level of governmental aid to the poorer school districts. The poorer school districts lack local wealth, which may be defined differently from state to state. Despite differing definition of local wealth in the state aid formulas, it is the proposition of Serrano-type court decisions that school revenues per educational need unit should not correlate with the local school district wealth. This notion of "fiscal neutrality" might well allow for variations in revenue and spending levels due to varying needs and costs, but not due to local resources. In order to achieve fiscal neutrality, many states have recently accepted the notion that state aid to local school districts should be inversely distributed to poorer districts, so as to offset their lack of local resources. A review of the relationship among local wealth, state aid, and total school revenue, and of the equalizing effect of state aid distribution, and of the effect of state aid funding reforms

on the movement of the funding system toward the goal of equity is, therefore, important.

The following review of literature is presented in three sections: (1) school revenue associated with district wealth, (2) the equalizing effect of the state aid distribution, and (3) evaluation of school financing systems.

School Revenue (Expenditure) Associated With District Wealth

In 1960, Hirsch conducted a study of the determinants of public education expenditures in St. Louis County, Missouri.[1] There was relatively little state aid available to the school districts in the county at that time. Hirsch developed an expenditure model with two dependent variables--total expenditures with debt service, and total expenditures without debt service. These variables were used against the following six independent variables: (1) the number of pupils in ADA in public primary and secondary schools, (2) the number of high school pupils in ADA as a percent of all pupils in ADA, (3) the number of public school pupils in ADA per square miles, (4) the percent increase in public school pupils in ADA from 1951 to 1956, (5) the average assessed valuation of real property per pupil in ADA, and (6) an index of scope and quality of public education in primary and secondary schools, which was composed of six subindices: (1) number of teachers per 100 pupils in ADA, (2) number of college hours of average teacher, (3) average teacher salary, (4) percent of teachers with more than ten years of experience, (5) number of high school credit hours, and (6) percent of high school seniors entering college. It was found in both regressions that 82 percent of the

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[1]Werner Z. Hirsch, "Determinants of Public Education Expenditures," National Tax Journal, Vol. XIII, No. 1 (1960), 29-36.

variation in total expenditures could be accounted for by the six independent variables. Average assessed valuation per pupil was by far the most significant variable followed by scope and quality of education and then by the primary-secondary school ratio.

Alan G. Hickrod studied the effect of human resources migration on school finance in five major metropolitan areas in late 1969.[2] Five variables were found significantly correlated with educational expenditure in most of the metropolitan areas in the study. They are: assessed valuation of property per pupil, educational tax rate, percent college educated, median family income, and occupational index. Further, he found clusters of disadvantaged school districts geographically separated from clusters of advantaged school districts. Hickrod noted "There is evidence of increasing determination of local levels of spending by the material and human resources present in the various school districts."[3] Also, he found that industrialized suburban school districts appear to have a high level of educational expenditure per pupil while working men's "bedroom" suburban school districts require high effort to achieve modest expenditures. In another study, Hickrod and Sabulao examined social and economic inequalities in seventy-two districts in the Boston Standard Metropolitan Statistical Area (SMSA), twenty-eight districts in the Chicago SMSA, twenty-nine districts in the Cleveland SMSA, twenty-three districts in the St. Louis SMSA, and twenty-three districts in the

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[2]Alan G. Hickrod, Further Exploration in Human Resource Migration Among School Districts in Metropolitan Areas and the Effect of This Migration Upon School Finance: Final Report (Washington, D.C.: USOE, DHEW, Bureau of Research, September 1969).

[3]Ibid., p. 45.

Detroit SMSA.[4] They found considerable variation of educational expenditure among metropolitan areas.

A similar study of educational expenditures in large city school districts was published by Walter I. Garms in 1967.[5] He used seventeen independent variables in his regression model and found that those variables explained 73 percent of the variation in school expenditures. Property assessed valuation per pupil was found to be the fifth significant variable of his seventeen variables. The first four leading variables were as follows: (1) percent of labor force unemployed, (2) median family income, (3) percent homeowners with negative sign on regression coefficient, and (4) median years of schooling. The regional differences were later added to the model. The inclusion of this variable raised variation in educational expenditures explained from 73 percent to 85 percent.

The 1961 study of financing government in a metropolitan area by Sacks and Hellmuth included thirty-two school systems for the period 1950-1958.[6] The independent variables they used were: (1) changes in assessed valuation, (2) changes in average daily membership, and (3) changes in state aid. Regression analysis revealed that changes in assessed valuation was still the most significant single variable to account for the variation of school expenditures.

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[4]Alan G. Hickrod and Cesar M. Sabulao, Increasing Social and Economic Inequalities Among Suburban Schools (Danville, Ill.: Interstate Printers and Publishers, 1969).

[5]Walter I. Garms, "Financial Characteristics and Problems of Large City School Districts," Educational Administration Quarterly (Winter 1967), 14-27.

[6]Seymour Sacks and William F. Hellmuth, Jr., Financing Government in a Metropolitan Area (New York: The Free Press of Glencoe, 1961), pp. 68-154.

James, Thomas, and Dyck studied the financial structures of school districts drawn from nine states.[7] Eight independent variables were used in the regressions. Property assessed valuation was found positively correlated with expenditures per pupil in average daily attendance 1958-59 in all of the regressions, but it was significant statistically in only five states. Median family income was positively correlated with expenditures in eight states, but was significant in only four. The percent of non-white was positively related to expenditures in five states, but negatively in four. The percent of owner-occupied housing was negatively correlated with expenditures and was significant in all states except Nebraska and Oregon. Median years of schooling was positively related to expenditure in two states, negative in three. The percent of labor force unemployed was significantly negatively correlated with expenditure in three states. Percent of farm population was negatively related to expenditure in four, while percent of elementary school children in private schools was significantly related to expenditures in two--one was positive and the other negative.

In studying the determinants of tax effort in Kentucky in 1973, Kay defined local tax effort as the ratio of local revenue per pupil in ADA and equalized assessed valuation of property per pupil in ADA, and used this dependent variable (local tax effort) against twenty-four selected sociocconomic independent variables.[8] A stepwise multiple

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[7]Thomas H. James, et al., Wealth, Expenditure and Decision-Making for Education, U.S. Department of Health, Education and Welfare, Cooperative Research Project No. 1241 (Stanford, California: School of Education, Stanford University, 1963).

[8]H. R. Kay, Jr., "The Study of the Relationship Between Selected Socio-Economic Variables and Local Tax Effort to Support Public Schools in Kentucky" (Unpublished Ph.D. Dissertation, University of Florida, 1973).

regression analysis was performed between the measure of effort and all socioeconomic variables on which district data could be collected. In addition, two stepwise regressions were performed on the one-third of all 192 school districts with the highest assessed valuation of property per pupil and upon the one-third with lowest assessed valuation of property. It was found that wealthy urban areas consistently tend to tax themselves proportionately higher than poor rural districts. More interestingly, in wealthy districts, the socioeconomic variables in Kay's model explained a substantial portion of the variance in tax effort, while for poor wealth school districts, idiosyncratic variables such as the attitudes of local opinion leaders regarding education, were generally more important than the socioeconomic variables. When individual variables were correlated with tax effort, the most significant variable related to effort was property tax base. Where the tax base was composed of farms, there tended to be low effort. Where it was composed of businesses and residences, there tended to be high tax effort. Finally, the study suggested that equity of financing education through optional taxation should be questioned since wealthy urban school districts clearly tended to provide disproportionately more educational resources for their children than poor rural districts.

Harrey, in 1969, studied the determinants of educational expenditures in Santa Clara County, California.[9] His study sought to determine if certain socioeconomic characteristics of school districts were related to educational expenditures during the 1966-67 school year. Eighteen

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[9]Laurrence Ewin. Harrey, "Property Tax Determinants of Educational Expenditures" (Unpublished Ph.D. Dissertation, Stanford University, February 1969).

socioeconomic variables were selected and analyzed by means of multiple regression with educational expenditure per pupil as the dependent variable. One of the independent variables was total assessed valuation per pupil which was the combination of (1) residential property, (2) commercial property, (3) industrial property, and (4) agricultural property, all in terms of assessed valuation per pupil. The statistical analysis was performed first with total assessed property valuation per pupil, secondly with the above mentioned four types of property valuation, thirdly with total assessed valuation plus other socioeconomic factors, fourthly with the four types of property assessed valuation and other socioeconomic factors, and fifthly with only socioeconomic variables, excluding property assessed valuation.

Assessed property valuation was the most significant determinant of educational expenditures for the 29 elementary school districts in Santa Clara County. The separate classifications of residential, agricultural, and commercial properties were jointly able to explain from 66 to 89 percent of the variation in the current costs of elementary education in Santa Clara County for the school year 1966-67.[10] Since there existed only one heavily agricultural property-oriented district, the data was repeatedly analyzed without the inclusion of that district. Again, total assessed property valuation per pupil remained the most significant single determinant of elementary educational expenditures in Santa Clara County. The separate classification of property assessed valuation seemed not to be significant as predictors of educational expenditure for this analysis. This reduction of significance level was

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[10]Ibid., p. 58.

largely due to the absence of the heavily agricultural property-oriented Montebello district. With respect to the effect of state aid on equity, it was found that it had an insignificant impact in Santa Clara County, where variation of educational expenditure per pupil was significantly related to assessed valuation of property.

Equalizing Effect of State Aid

Renshaw studied the effects of state aid on expenditures for education in the 48 continental states.[11] Like Hirsch, Renshaw used the following two dependent variables: (1) the current expenditures for school operation, and (2) the total school budget. Nine independent variables were included in the four regression models. Each model contained two, three, or four variables, consecutively. Per capita state income and percentage of non-white population were found to be significant at the .95 confidence level and state aid per pupil was nearly so. However, the sign of regression coefficient for state aid per pupil was negative. This indicated that state aid was inversely allocated to financially poor school districts. However, the effect of state aid on per pupil spending was minimal. An additional dollar of state aid tended to raise school expenditures by only about 16 cents.[12]

Bishop also investigated the effect (stimulative vs. substitutive) of state aid on educational expenditures in New England.[13] The

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[11]Edward F. Renshaw, "A note on the Expenditure Effect of State Aid to Education," Journal of Political Economy, Vol. LXVII, No. 6 (December 1959), pp. 170-174.

[12]Ibid., p. 172.

[13]George A. Bishop, "Stimulative vs. Substitutive Effects of State School Aid in New England," National Tax Journal, Vol. XVII, No. 2 (1964), pp. 133-141.

stimulative, substitutive and equalizing effects on school expenditures were estimated through multiple regression analysis. Two regressions were run for each state in New England. One was for the school districts outside SMSA, one for the school districts inside SMSA. Bishop found that state aid in the largest districts (SMSA) was not a significant influence on school expenditures, and consequently, must be a substitute for local tax burdens. However, the sign of the regression coefficient for state aid per pupil in the Massachusetts regression model was negative. This indicated there existed an equalization effect of state aid on school expenditure. Thus, state aid is higher and local tax burdens are reduced in districts with relatively low expenditures per pupil. On the other hand, the state aid for outside metropolitan areas had a positive sign of regression coefficient. This demonstrated that the state aid had a positive effect on school spending and was definitely stimulative, and tended to raise rather than to reduce the local property tax burden.

Rossmiller's study of the equalization objective of state aid in 104 Wisconsin school districts for the 1959-60 school year included 76 ability variables and 85 need variables.[14] Multiple correlation and factor analysis were used for the purpose of eliminating some variables which had relatively high interrelation. Finally, 48 ability variables and 32 need variables were selected and again subjected to factor analysis. Application of factor analysis to the combination of 70 need and ability variables resulted in the extraction of 51 factors accounting

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[14]Richard A. Rossmiller, "The Equalization Objective in State Support Programs: An Analysis of Measures Need and Ability," National Tax Journal, Vol. XVIII, No. 4, pp. 362-369.

for 83 percent of the total variance. One of the generalizations relevant to the state aid objective was that the Wisconsin state support program was achieving some equalization of school expenditure. The percentage of revenue from state sources was found inversely related to equalized valuation. Although the equalization function of the Wisconsin state support program was operating, it was found that the poorer schools were still at a relative financial disadvantage.

In all of the previous studies (excepting Rossmiller's) the state aid was treated as an explanatory variable in the single equation multiple regression in which the state aid effect on educational expenditure was determined. It has been argued by several authors that such a technique may produce biased results.[15] If educational expenditures are determined by the interplay of both supply and demand forces, the single regression equation, combining both supply and demand variables together, could lead to simultaneous equation bias.[16] Elchanan Cohn attempted to overcome this simultaneous-equation bias problem in his two school finance studies. Both of his studies explored the effect of state aid on educational expenditures by employing simultaneous relationship models.

In his interstate model, five endogenous variables and ten exogenous variables were adopted.[17] The five endogenous variables were (1) relative size of schools, (2) expenditure per ADA, (3) percentage of pupils enrolled in nonpublic schools, (4) total approved par value of bond issue, and (5) local revenue per ADA. The exogenous variables included (1) percentage of total population enrolled in public schools,

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[15]Elchanan Cohn, Economics of State Aid to Education (New York: D. C. Heath and Company, 1974), p. 69.

[16]Ibid., p. 69.

[17]Ibid., p. 73.

(2) personal income per capita, (3) personal income per ADA, (4) equalization score of the state, (5) Negro enrollment in public schools as a percentage of total population, (6) urban population as a percentage of total population, (7) incidence of poverty, (8) average teachers' salary, (9) state aid per ADA, and (10) number of students per 1,000 teachers. Both two-stage least square and ordinary least square methods were applied to the model which contained five equations. Each equation used one of the endogenous variables as a dependent variable against some selected independent exogenous and endogenous variables. The regression results were reported in the study in a way that each equation was treated independent of the others when ordinary least square method was employed. When applying two stage least square method to the analysis, these five equations were considered as interdependent of each other. As a result of these different treatments, the two stage least square method (TSLS) provided clearly different estimates from the ordinary least square (OLS) estimates. For example, the OLS estimates produced five significant estimators of local revenue per ADA, while the TSLS produced only one statistically significant variable (that is, state aid).

Disregarding the other different results produced from TSLS and OLS, the coefficient of state aid per ADA estimated from both TSLS and OLS remained statistically significant in both educational expenditure function and in local revenue function. The magnitude and sign of regression coefficients in expenditure and local revenue functions indicated that a greater level of state aid is associated with greater per pupil expenditures, and lower local revenues for education. An important limitation of this interstate study indicated by the author was the lack of a measure indicating the manner by which state aid was distributed.

To overcome this limitation, an intrastate model was employed.

Cohn's intrastate model was based on Clyde's 1973 study of educational expenditure determination.[18] The major objective of Clyde's study was to obtain supply and demand schedules for local educational expenditures in Pennsylvania counties.[19] In order to investigate the state aid distribution effect on school district educational expenditures, the school district was used as the basic data unit of analysis.

Cohn's intrastate model contained five endogenous and twelve exogenous variables in demand and supply equations. The state aid per capita was specified in the supply equation and served as both determinant and determined variable of school expenditure because the state aid formula for Pennsylvania was of the percentage equalizing type.

The two stage least square method was utilized to obtain estimates for the parameters of those five simultaneous equations. The model appeared to provide a reasonably good statistical fit for all of the supply equations, but a disappointing fit for the demand equation.

The result, with respect to state aid distribution, indicated a good measure of equity. The regression coefficient for district wealth measured by market valuation of real property per capita divided by state average was -87.72. That is, for each one percent in property valuation over the average state valuation, state aid decreased by about $0.88 per capita. This indicated that the state aid was inversely allocated in Pennsylvania to the poorer school districts. Thus, the equalizing effect of state aid distribution under the percentage equalizing formula in 1973

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[18]Ibid., p. 83.

[19]Ibid., p. 84.

was confirmed.

Evaluation of School Finance Systems

Analysis of equity of school finance systems can profit from the review of some past evaluative studies. As a matter of fact, there have not been very many evaluative studies published. One problem contributing to this lack of publications in the past has been the lack of interest in the total distribution of state aid or of school revenue. Often there is concern that certain districts are being favored or shortchanged, but seldom is there discussion of the equity of the general pattern of local school revenue or of the state aid distribution.[20] Hickrod was one of those who initially moved the finance research systematically to that evaluative direction. In 1972, he started examining the equity of the distribution of school revenue and developed four normative models.[21] The first model was termed "permissible variance." This model concerns the total distribution of state aid. The goal of this model, then, was to reduce variation to some permissible range. The second was an inverse allocation model which relates general state aid to school district wealth in an inverse fashion. This model was developed from a belief that there existed a positive relation between the local wealth and local revenue. This aid function can be approximated by a logarithmic transformation of either the wealth variable or the aid variable, or both. Fiscal neutrality

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[20]Walter I. Garms, "Use of the Lorenz Curve and Gini Index in School Finance Research" (a paper presented at the 1975 Annual Meeting of the The American Educational Research Association in Washington, D.C., 1975).

[21]Alan G. Hickrod, et al., Definition, Measurement and Application of the Concept of Equalization in School Finance (Springfield, Ill.: Illinois Office of Education, 1972) (available as document ED 078 551 in ERIC system).

was the third model which was drawn from the court decisions (Serrano v. Priest, 1971) and the argumentation presented in Cooms, Clune, and Sugarman.[22] This fiscal neutrality model requires that no state may operate an educational fiscal system in which expenditure levels are primarily determined by the local wealth of the school district.[23] Alternatively, the expenditure levels should not be dependent upon the local wealth, but, rather, upon the wealth of the state as a whole. The fourth model was the fiscal intervention model which requires that the level of educational achievement may not be a function of wealth other than the wealth of the state.

Two of these four models proposed by Professor Hickrod and his associates have been applied to the realities of public school finance in Hickrod's later study of "fiscal equalization in Illinois" in 1973.[24] The purpose of the study was to evaluate the degree of movement of state aid funding toward the goal of equity which was defined in terms of permissible variance (the first model) and fiscal neutrality (the third model). The coefficient of variation and the Gini Index were used to measure the disparity of school revenue among the school districts and the distribution of school revenue in relation to the local wealth. Nine years were included in the study--1963 to 1971. It was found that the value of the coefficient of variation of both expenditures and tax effort fell for all types of school districts (i.e., elementary, high,

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[22]Ibid., p. 18.

[23]Ibid., p. 19.

[24]Alan G. Hickrod and Ramish Chauhari, A Longitudinal Study of Fiscal Equalization in Illinois (a paper presented for the 1973 Annual Meeting of the American Educational Research Association, New Orleans, Louisiana).

and unit school districts) and indicated that school districts in Illinois were becoming more fiscally alike with passage of time. However, the coefficient of variation for wealth for unit and elementary school districts were about as unequal with regard to wealth at the end of the time period as they were at the beginning of the time period. Only the high school districts demonstrated a reduction of variation in wealth. With respect to the fiscal neutrality goal, there had been no marked improvement in fiscal neutrality in Illinois during years from 1965 to 1971. For the elementary and high school districts, fiscal neutrality was slightly improved. For unit school districts, the magnitude of gini coefficients was actually increased, and did not show any improvement in fiscal neutrality. As was observed in the fiscal neutrality model the students in the poorer unit school districts had suffered a reduction in their share of state aid.

In 1973, the old Illinois state aid funding system was amended and a completely different version--power equalization concept--was added. It was the opinion of Professors Hickrod and Hubbard at Illinois State University that it was necessary to assure that school finance reforms should not go unevaluated. It was the researcher's responsibility to inform the policy-makers and to encourage them to take a hard look at the consequences of the reform. The evaluation task of the 1973 reform of the Illinois general purpose educational grant-in-aid was started in mid-1974 and completed in late 1974.[25] The evaluation included the following three criteria: (1) permissible variance,

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[25]Alan G. Hickrod, Ben C. Hubbard, and Thomas Wei Chi Yang, The 1973 Reform of the Illinois General Purpose Educational Grant-in-Aid: A Description and an Evaluation.

(2) fiscal neutrality, and (3) reward for effort. The coefficient of variation and the Mcloone index were used for the criteria permissible variance; Gini index and regression analysis were used for fiscal neutrality; and reward for effort was measured again by single regression analysis with and without logarithmic transformation. Under the criteria of permissible variance, it was found that overall disparity in both school revenues and tax rates declined after the adoption of the 1973 reform. If the focus was not on the entire distribution but only on the distribution below the median, there appeared to have been some improvement in unit school districts, and in high school districts, after the reform of 1973, but not in the case of elementary districts.[26] In the measurement of fiscal neutrality, the wealth definition was specified respectively by the property valuation per pupil and income per pupil. Income data were obtained from 1970 census data which was recorded by county and township, and was then transferred by Dr. Polhmann, Professor in the Department of Sociology at Illinois State University, to the school district type data. It was found that the Gini indexes declined both when property valuation per pupil was used as the specification of wealth and when income per pupil was used as the specification of wealth. If the largest school district, Chicago, was dropped, movement toward the goal of fiscal neutrality was observed in all types of school districts. Reward for effort with no logarythmic transformation was also examined. The study found that before the 1973 reform, each one cent in tax rates in elementary districts was on the average associated with $17.73 in state and local revenues per ADA. After the reform, the

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[26]Ibid., p. 48.

reward for each one cent increment in tax rates was $23.73. Encouragement to raise local tax rates had then been increased by $6.00. For unit school districts, the increase in the reward for effort was only $4.50, not as large as that in elementary school districts. By contrast, there was no increase in reward for effort for the high school districts. However, if elasticity of school revenue with respect to tax is accepted and used, the data in their study showed that the elasticity for tax was increased in elementary districts and unit districts but not in high school districts. These results were consistent with those obtained from no logarythmic transformation regression.

The Illinois' study done by Hickrod, Hubbard, and Yang was sent out to a number of educators, legislators, and researchers. After this circulation, a number of researchers showed their interest in inequities of educational expenditures and the use of the Lorenz curve in school finance research. Three studies appeared at the same time in 1975, and two were presented at the Annual Meeting of the American Educational Research Association in Washington, D.C. One was presented at the 1975 Annual Meeting of the Ohio Association of Economists and Political Scientists in Columbus, Ohio. They were studied by (1) Robert E. Firestine,[27] (2) Walter I. Garms,[28] and (3) Bruce L. Gensemer.[29]

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[27]Robert T. Firestine, Some Empirical Approaches to Comparing Equity in School Finance Systems: A Few Observations on Hickrod's "Bi-Variate" Lorenz Curves (presented at the Annual Meeting of the American Educational Research Association, April 1975, in Washington, D.C.).

[28]Walter I. Garms, Use of the Lorenz Curve and Gini Index in School Finance Research (presented at the Annual Meeting of the American Educational Research Association, April 1975, in Washington, D.C.).

[29]Ibid.

Firestine selected thirteen states which included California, Colorado, Illinois, Kansas, Massachusetts, Michigan, Mississippi, New York, North Carolina, Ohio, Texas, Virginia, and Washington. These thirteen states were chosen because of their representation of a broad spectrum of states in terms of regional location, level of state participation in public school funding, type of state school financing system, and state socioeconomic characteristics.[30] In Firestine's study, he did not use the total population. Instead, he took a random sample of districts based on the Elementary and Secondary Education General Information survey for school year 1969-70. All fiscal data reported in his study were for that year. The data included general aid from the state, categorical aid from both federal and state, and revenue from the local district.

School revenue inequity was estimated by the use of the Lorenz curve and Gini Index in this study. The bi-variate Lorenz curve was found to appear surprisingly close to the 45-degree line for all of the states in the sample, and a non-monotonically increasing shape of the curve was revealed, especially in Colorado, where the curve slope exceeded a 45-degree line from about the 15th to the 50th percentile of state total ADA. Similarly, the curve's crossing of 45-degree line were observed in Ohio, Texas, Virginia, and Illinois. (Illinois was not identified by Firestine in his study.)[31] The Illinois' result from the Firestine study was quite inconsistent with Hickrod's first longitudinal study in 1973, which included 1969 data.

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[30]Ibid., p. 6.

[31]Ibid., p. 11.

In looking at the effect of federal grants, it was found that federal aid appeared to have an equalizing effect in most of the states in the sample. Conversely, federal aid seemed to have counter-equalizing effects in the states of New York, Texas, Virginia, and Washington.[32]

The second study was Garms' study of the useability of the Lorenz curve and Gini index in school finance research. Unlike Firestine, Garms devoted considerable space to discussing various ways of using the Lorenz curve and their consequences with his fictitious data. He indicated that there existed a difference in applying the Lorenz curve to data which had been arrayed (1) in order of increasing fiscal ability per pupil and (2) not in order of increasing fiscal ability per pupil.[33] If the data were arrayed in order of increasing fiscal ability per pupil, the Lorenz curve could provide information relative to the extent to which differences in expenditure correlated with differences in fiscal ability. On the other hand, if the data were not arrayed in order of fiscal ability, the result would provide no information about how much of the expenditure disparity is caused by the disparity of fiscal ability. This technique of arraying school districts in order of increasing fiscal ability had been applied in the 1973 Hickrod and Chauhari's longitudinal study of fiscal equalization in Illinois.[34]

The third study by Gensemer dealt with the notion of fiscal neutrality, educational need and fiscal capacity. The purpose of his study was to explore the distributional effects of state aid in Ohio and the equity implications of the Ohio General Assembly's Educational Review Committee's proposals on new state aid funding system. The Committee's

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[32]Ibid., p. 13. [33]Ibid., p. 6. [34]Ibid.

major proposals concerned the distribution of basic aid, the adoption of equalized property values to measure the wealth and local tax effort of districts, and the broadening of one categorical aid program.[35] The basic state aid proposal called for a "district power equalization formula" and was an attempt to reduce the school revenue disparity among school districts in Ohio by inversely allocating state aid to the poorer districts to a greater extent than ever before. The new proposed state aid formula was constructed to assure that each district receiving $48 per pupil per tax mill in the combined state aid and local revenues. Because there was no recapture provision in the proposal, the rich school districts with excess fiscal ability would not be forced to return any excess tax dollars collected to the state for redistribution purposes. Another key feature of the proposal was reward for effort. The poor school districts with moderate school taxes could receive three dollars in state aid for each new dollar of local taxes levied.

Under the new proposal, to participate in state aid plan, school districts must, by 1977, raise property tax rates to 21 mills for school operation purposes. This might require some school districts to make a dramatic increase in their property tax levy, since some school districts' tax rates are only about 14 mills.

In measuring the effect of state aid distribution under the new proposal, the Lorenz curve and Gini index were used in Gensemer's study. The study period was ten years, starting from 1968 to 1978. It found that the state aid distribution effect under the new proposal appeared to be greater in moving the funding system toward the goal of fiscal

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[35]Ibid., p. 5.

neutrality than the effect under the current state aid funding system. The Gini index for school revenue disparity was reduced from 0.769 in 1968 to 0.384 in 1978. This reduction of Gini index for school revenue seemed to be due to the highly negative correlation between the district fiscal ability and the allocation of state aid. The Gini index for distribution of state aid was negatively increased from -0.2234 in 1974 to -0.269 in the 1978 school year. That means that the proposal allocated more state aid to the poorer school districts than did the current Ohio financing system.[36]

Summary

Of considerable interest is that district wealth has been mentioned repeatedly in a number of studies in the first section of this chapter as a significant variable related to school expenditures. Less wealthy school districts often have less revenue resources than their wealthier counterparts to secure school funds. The dependence of school expenditure on local wealth is in opposition to the spirit of fiscal neutrality stressed by the Serrano decision. Without state governmental intervention aid to the poor school districts, property poor school districts will stay poor and will be unable to provide quality education. A number of previous research works in section two of this chapter have indicated that the inverse distribution of state aid to the financially poor school districts has an equalizing effect on educational expenditures.

All of the studies mentioned in section two were cross-sectional studies. A major limitation of the cross-sectional study is a lack of

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[36]Ibid., p. 24.

demonstration indicating a movement of the state financing system toward the goal of fiscal neutrality. In section three, three longitudinal studies were presented. A ten-year trend of variation coefficients as measure of school revenue disparities and of Gini indexes as measure of fiscal neutrality were reported in Hickrod's 1973 study. In the same year, 1973, Illinois amended its foundation system and adopted a power-equalizing formula. This reform was continuously evaluated and the effect of the reform on the movement of the state toward the goal of fiscal neutrality and of narrowing the variation of school revenue per educational need unit was reported in Hickrod's 1974 study. It was found that movement was made toward these two goals. These were, again, short run results of the 1973 reform. Some of these gains could be reversed in the following three phase-in periods. Only time and further research can reveal whether the recent reform in the State of Illinois will move the state closer toward the goals of fiscal neutrality and of reduction of school revenue per educational need unit among school districts. Chapter three of this study will be the review of financing systems in Illinois, Michigan and Kansas. The financing systems in these three states will be examined on a continuous basis including one year before and two years after the reform of state aid financing systems.

CHAPTER III

THE REVIEW OF RECENT DEVELOPMENTS OF SCHOOL FINANCING SYSTEMS IN THE STATES OF ILLINOIS, MICHIGAN, AND KANSAS

The purpose of this chapter is to describe the state financing system for general public education in 1972-73 and the newly enacted state financing systems of 1973 in Illinois, Michigan, and Kansas. Since the changing of the Michigan and Kansas state financing systems was in part due to the effect of court decisions, this chapter also reviews the court cases of Milliken v. Green in Michigan and of Caldwell v. the State of Kansas in Kansas. This chapter also provides a list of similarities among these three states' state financing systems for the purpose of interstate comparison.

Illinois

The State Aid Financing System in the State of Illinois (1972-73)

The fundamental allocation scheme of state aid in supporting Illinois' elementary and secondary education in 1972-73 was a Strayer-Haig foundation system. The system provided that each district that taxed itself at a minimum, or qualifying rate--1.08 percent of assessed valuation for unit school districts which have grades K-12, for dual districts which have grades K-8 or grades 9-12, .84 percent for those with a WADA (Weighted Average Daily Attendance) of 100, and .90 percent for those with a WADA of less than 100--would be cligible to receive a state maximum guarantee of $520 plus 19 percent of the amount

granted.[1] The flat grant was included in this system to guarantee that each district would receive at least a minimum of aid from the state. The flat grant in 1972-73 remained at $48 for each WADA. The system further provided an alternate state aid computation method; that is, if the amount of state aid calculated is less than $120 per WADA pupil, the amount of state aid per pupil in WADA for the best six months would be computed by multiplying the quotient of the assessed valuation per pupil necessary to produce $120 state aid per WADA pupil, divided by the district's assessed valuation per WADA, and multiplied by $120.[2] Under this system, however, in no case was a district to receive less than a $48 flat grant plus 19 percent of that amount from the state. Moreover, the foundation system added density bonus to the districts with a WADA 10,000 to 19,000 by four percent of the guarantee, districts with a WADA of 20,000 to 29,999 by eight percent of the guarantee, districts 30,000 to 200,000 by twelve percent of the guarantee, and districts over 200,000 WADA by sixteen percent of the guarantee.[3]

The foundation allocation system in 1972-73 in Illinois was designed to distribute the state dollars in inverse relation to the local tax base. Despite the flat grant and alternate method of state aid computation, the relationship between state aid and local property assessed valuation would be linear with a negative sign in slope. Arithmetically, this relationship, ignoring other factors, can be expressed as follows:

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[1]Bureau of Budget, State, Local, and Federal Financing for Illinois Public Schools: 1972-73 (Springfield, Ill.: The Office of the Superintendent of Public Instruction of the State of Illinois), pp. 5-6.

[2]Ibid., p. 5.

[3]Ibid., p. 6.

Unit District	State aid = State Guarantee - 1.08% district valuation
Dual District	State aid = State Guarantee - 0.84 or 0.90 district valuation

The slope in the equations are determined by the qualifying tax rate.

The Present State Aid Financing System in the State of Illinois

In recognition of possible effects and implications of the Supreme Court decision in the case of Serrano v. Priest, educators and legislators began to understand the shortcomings of foundation systems and to search for new school financing formulae to allocate the state dollars to the school districts more equitably. In 1973, House Bill 1484 was approved by both the House and the Senate. Under this new bill dealing with school finance for public education, the previous foundation program was retained with an important option for the school districts. This option is called a resource equalizer plan which includes operational tax rates as a multiplier. Under this new equalized plan, there are operating tax limits of 30 mills for unit school districts, 19.5 mills for elementary districts, and 10.5 mills for high school districts which can be exceeded only under one of the following conditions: (1) districts previously taxing above the limit must reduce their previous rate and the applicable rate limit; (2) districts previously spending more than $1260 per pupil may continue to levy higher taxes to maintain their 1972-73 spending levels; (3) any district may exceed these rate limits in order to increase expenditures for innovative, experimental, and enrichment programs up to 15 percent over the 1972-73 expenditures if it obtains the approval of its voters.[4]

[4]Norton W. Grubb, "The First Round of Legislative Reforms in the Post Serrano World," Law and Contemporary Problems, Vol. XXXVIII (Winter-Spring, 1974), pp. 477-78.

However, if at the time of the enactment of this formula, the district's tax rate is beyond the level of maximum limit, the local board of education may pass a resolution to maintain its tax rate, subject to a back-door referendum.

In the present school finance system of Illinois, a district's claim amount per WADA is based on the concentration of elementary and secondary education (ESEA) Title I eligible pupils, wealth as measured by assessed valuation per weighted average daily attendance pupil, and operating tax rate.[5] Claim amounts for the current year are limited to an increase of one-fourth of last year's actual entitlement.[6] Because of this limit on the increase of state participation by no more than 25 percent a year, some school districts may not be fully funded during the fourth year of the operation of the "Resource Equalizer" formula, and hence, it will take longer than a four year phase-in period for full funding to be realized.

Under the new district power equalization formula, districts with the maximum allocated operating tax rate (i.e., 1.05% for elementary districts, 1.95% for high school districts, 3.00% for unit school districts) will have a state guaranteed foundation level of $1260 per TWADA (Title I weighted average daily attendance), when the phase-in period of the formula is completed. The guarantee yield corresponds to a guaranteed assessed valuation per TWADA for unit, elementary, and high school districts as $42,000, $64,615, and $120,000, respectively.[7] During 1973-74, approximately 93 percent of Illinois pupils were enrolled in resource equalizer school districts.[8]

[5]State of Illinois, Bureau of the Budget, State, Local and Federal Financing for Illinois Public Schools, 1973-74 (Springfield: The Office of the Superintendent of Public Instruction of the State of Illinois), p. 48.
[6]Ibid., p. 48. [7]Ibid., p. 50. [8]Ibid., 1974-75, p. 7.

Michigan

The State Aid Financing System in the State of Michigan (1972-73)

The basic formula for the distribution of state general-purpose revenue in Michigan in 1972-73 was a foundation system. It was called the Deductible Millage System." Essentially, under this deductible millage system, a minimum yield per pupil was guaranteed for districts levying the minimum qualifying tax rate. The formula was designed in an attempt to compensate for differences in district tax bases by giving low property assessed valuation districts larger amounts of state aid than high property assessed valuation districts. Under this formula, the state aid was computed by subtracting the amount which a given millage would raise in each district from the gross allowance or from a specified foundation program. The 1972-73 formula was $644 minus 16 mills for districts with more than $17,750 SEV (Stated Equalized Valuation) and $715 minus 20 mills for districts below this level.[9] Districts with $17,750 SEV received $360 per pupil in state aid by using either the first or second formula. Both deductible millage formulae were based on the district's property valuation. The relationship between state aid and district's property valuation is linear. Arithmetically, the distribution of state aid for the school year 1972-73 can be described by the following linear equations:

District's Wealth:
(a) less than $17750 . . . . . State aid = 715 - 0.02 SEV
(b) over $17750 . . . . . State aid = 360 - 0.016 (SEV-17750)

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[9]G. Caesar, Robert N. Mckerr and J. Phelps, New Equity in Michigan School Finance (The Senate Committee on Education, 1973), p. 6.

Legal Challenge to the School Financing System in the State of Michigan

In December 1972, the Michigan Supreme Court in the case of Milliken v. Green held that Michigan financing system, a deductible-millage system, was in violation of the state constitution.[10] In reaching its decision, the Supreme Court made the following basic arguments or findings:

(1) State Control and Responsibility:
The state clearly has responsibility for financing public school education in Michigan. The 1963 Michigan Constitution, Art 8, S 2 reads:
"The legislature shall maintain and support a system of free public elementary and secondary schools as defined by law."[11]

(2) Inherent inequality in School District Property Tax Bases:
There is an inherent inequality in the school district property tax bases which creates unequal support for the education of Michigan children.[12]

(3) State School Aid Does Not Equalize Property Tax Inequality:
The state school aid formula does not compensate for the recognized basic inequality inherent in the differences in the property tax bases of the 624 Michigan school districts.[13]
Only about one-third of the state's school districts receive nearly equal total revenues from combined state and local school property taxes.[14]

(4) Equal Protection:
The heart of this case is to confront the law of "equal protection" with the reality of the inequality inherent in the Michigan public school finance system.[15]
It is elementary that the law of equal protection involves two different tests depending upon the interest concerned.[16]
(a) education in Michigan a fundamental interest: The fundamental interest of the people in Michigan in education is expressed in our history and in our constitutions, as my brother brother Brennan has so excellently described. The 1963 Michigan Constitution establishes the people's fundamental interest in education in a number of ways, but significantly in that it devotes an entire article to education, Article 8.[17] In light of the people's concern and direct provision for education in the Constitution,

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[10]Milliken v. Green, Supreme Court, Michigan, No. 54, 809. Memorandum Decision (Dec. 29, 1972), p. 22.

[11]Ibid., p. 4. [12]Ibid., p. 7. [13]Ibid., p. 9.
[14]Ibid., p. 9. [15]Ibid., p. 15. [16]Ibid., p. 16.
[17]Ibid., p. 15.

this court is compelled to recognize education as a fundamental interest under the Michigan Constitution requiring close scrutiny of legislative classifications concerning the distribution of education resources.[18]

(b) Wealth, a suspect classification involved:
Classification on the basis of wealth is considered "suspect" especially when applied to fundamental interests.[19] The State Aid Act as well as the local school district property taxes are based on the classification of the state equalized valuation per pupil in the school districts. This is therefore an educational classification solely on the basis of wealth per educational unit (pupils) and puts the classification in the suspect category requiring the stricter standard of scrutiny.[20]

(5) Compelling State Interest:
There can be no "compelling state interest" for the classifications based on wealth resulting in the inequalities connected with the distribution of public school funds pursuant to the mandate of the Const. 1963, art 8, s 2 other than local control.[21]
Local control is the interest asserted by Defendants as justification for the district wealth classification under either constitutional test.[22]

Based on the fundamentality of education and the suspectness of wealth as a basis for classification, the Michigan Supreme Court ruled that the Michigan public school financing system denied equal protection of the laws guaranteed by Art 1, s 2 of the Michigan Constitution. Equal protection test required by the Michigan Constitution.[23]

The status of this decision is uncertain, since the composition of the court changed (two justices retired and two new justices were appointed), and defendants' petitions for rehearing of the case were granted on February 1, 1973. The case has been rebriefed and the parties are awaiting a final decision. Also, on August 14, 1973, Michigan enacted

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[18]Ibid., p. 16. [19]Ibid., p. 17. [20]Ibid., p. 18.
[21]Ibid., p. 18. [22]Ibid., p. 18. [23]Ibid., p. 22.

a new state aid financing system to test whether or not the current state aid financing system still denies equal protection of the laws requiring a new petition for the court's action.[24]

The Present State Aid Financing System in the State of Michigan

After the ruling of unconstitutionality of Michigan financing system for public education in December 1972 in the case of Milliken v. Green, Senate Bill 110 was enacted without awaiting a final decision from the Supreme Court. It was developed after extensive legislative debate and was the product of previously unsuccessful proposals for change.[25] The primary purpose of this bill is to equalize the revenue-raising ability of school districts. That is, to guarantee a minimum yield per mill of tax, but not necessarily to equalize yield across all districts.

Under this new bill (called the equal yield plan), all school districts are guaranteed an amount of combined state aid and local revenue equal to $38 per pupil mill for the first 22 mills levied in 1973-74, $39 per pupil per mill for the first 25 mills levied in 1974-75, and $40 per pupil per mill without limitation in 1975-76.[26] The amount of state membership aid allocated to each school district under this equal yield plan is simply determined by subtracting the district's per pupil state equalized valuation from $38,000 in 1973-74, $39,000 in 1974-75, and $40,000 in 1975-76; and the resulting difference is multiplied by the millage levied for operating purposes, up to and including

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[24]Ibid., p. 1.

[25]New Equity in Michigan School Finance: The Story of the Bursley Act, Senator Gilbert E. Bursley, Chairman (Lansing, Michigan: The Senator Committee on Education, 1973), p. 2.

[26]Ibid., p. 20.

22 mills in 1973-74, 25 mills in 1974-75, and without limitation thereafter.[27]

Two special provisions for saving school districts from suffering either losing total budget dollars or having minimal increases as a result of the new amendments of 1973 were included. Such districts levying less than 20 mills are credited with two-thirds of their deficiency under 20 mills in computing their aid for 1973-74, and with one-third of this deficiency in computing their 1974-75 state aid.[28] In addition, to protect certain districts with higher tax rates from suffering a total dollar loss, districts levying 20 mills or more are offered an alternate computation of state aid. Such districts are guaranteed an amount equal to their 1973-74 state aid per pupil minus 20 mills levied on their per pupil SEV increase in 1973-74. (These two provisions are called "the grandfather clause" in Michigan.)

Another provision was enacted under the equal yield plan specifically for the state's largest district--Detroit. Through separate legislation, Detroit was authorized to levy a local-district income tax of up to one percent--to be equated as six and one-half mills in the state aid formula--whenever the total allocated and extra-voted local levy drops below 22 mills.[30] This provision may be applied to other districts with some modifications.

Moreover, municipal overburden correction was added to the bill which gives additional revenues to those districts which have high non-school tax rates relative to the state average. If the non-school tax

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[27]Ibid., p. 21.

[28]Ibid., p. 22.

[29]Ibid., p. 22.

[30]Ibid., p. 22.

rate is 125 percent or more of the state average, the property assessed valuation is reduced by the percent by which the non-school tax rates exceeds 125 percent of the non-school tax rates of state average.[31]

Under the new legislation, a tax relief program (circuit-breaker) was included. The primary purpose of this program was to reduce property taxes for those individuals who pay more than a specified percentage of their income for property taxes. This program also applies to renters. The amount of tax relief provided by the program for the owners of properties is 60 percent of the excess of property taxes paid on the principal residence over 3.5 percent of total household income from all sources.[32] Renters receive similar relief, with 17 percent of their rent being counted as property tax.[33] For senior citizens, disabled veterans, and blind homeowners, a special provision was enacted. The amount of relief equals 100 percent of the excess over 3.5 percent of income.[34] The enactment of this tax relief program reduces the importance of personal income as a substantive factor in school finance.

Kansas

The State Aid Financing System in The State of Kansas (1972-73)

In the school year of 1972-73, the state aid financing system supporting elementary and secondary schools in Kansas was a very complicated foundation system compared to the state aid financing system in the states of Illinois and Michigan. Under this foundation system, the state aid guaranteed was not fixed and was dependent upon a number of variables which included (1) enrollment figures, (2) number of certified

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[31]Michigan's Revised State School Aid Act, 1973, Sec. 25, Ch. 2.
[32]Ibid., p. 19. [33]Ibid., p. 37. [34]Ibid., p. 37.

employees, (3) pupil/teacher ratio factor, (4) number of semester hours of college training of all certificated employees of the district, and (5) number of years of teaching and administrative experience of all certificated employees of the district. The state aid guaranteed is computed as follows:

1. Divide by 30 the total number of semester hours of college training of all certificated employees of the district (not to exceed two hundred and ten hours for any one employee);

2. Multiply by 0.2 the total number of years of teaching and administrative experience of all certificated employees of the district (not to exceed fifteen years for any one employee);

3. Multiple the sum of (1) and (2) above by seven hundred and sixty dollars, and multiply the product by the district's PTR factor, which was determined by pupil-teacher ratio and minimum requirement of pupil-teacher ratio. For districts whose pupil teacher ratio is less than the minimum requirement, PTR factor is the district's PTR divided by the required minimum pupil-teacher ratio which is dependent upon the size of school district.[35]

The state-shared guarantee under this system may be reduced by the imposition of a penalty for a low pupil/teacher ratio district.

After the computation of the state-shared guarantee, certain deductions were made from the state-shared guarantee. The principal deduction is the school district's portion of county ability based upon an economic index of 50 percent of a unified school district's home county's percentage of the state total adjusted valuation of tangible property, and 50 percent of a unified school district's home county's percentage of the state total of taxable income reported on state individual income tax returns. The economic index so obtained is then

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[35]Kansas School Foundation and Supplemental Aid Acts, the Provision of K.S.A. 1971, Supp. 72-7006 and 72-7008.

applied to the total amount of taxes which would be produced in the state by a ten mill levy in each county on the adjusted valuation of the preceding year of the county. The resultant product, known as "county ability" is then divided by the number of certificated employees in all the districts in the county to arrive at a "county ability per employee" figure. The county ability per employee is then multiplied by the number of certificated employees of each district in the county to determine the district's share of county ability. The product of this computation is then added to the non-district revenue of the district and the sum from the amount of the state-shared guarantee for the district is subtracted. The remainder is the amount of state aid the district is entitled to receive from the state general fund.[36] The non-district revenue as aforesaid may include (1) intangible tax, (2) district share of county school foundation tax, and (3) the district's share of county ability per employee.

The Kansas state aid financing system also attempted to narrow the school revenue disparities over time. Under the system, none of school districts were permitted to expend their budget for operating expenses per pupil more than 104 percent of the amount of the legally adopted budget for operating expenses per pupil in the preceding school year except as otherwise provided in the School Foundation and Supplemental Aid Act.

In addition to the state aid computed through the formula or foundation system, one additional revenue was added in 1971 to the local school districts by the legislature. This was known as the Supplemental

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[36]Ibid., p. 222.

State Aid Plan. The basic entitlement for each school district was established at $71.70 per student, plus $1,240 per certificated employee multiplied times an index based upon the adjusted assessed valuation of the school district.[37] Since the purpose of supplemental state aid was in part to equalize school revenue disparities, a higher index was assigned to lower valuation per pupil districts so they would receive more supplemental state aid than districts with high per pupil valuation.

In summary, the state funding system in 1972-73 in Kansas was basically a foundation system in which local shares from the state depended inversely on income as well as on property valuation. Supplemental aid was provided by the legislature in the form of increased state support to elementary and secondary schools, but this aid was not allocated by the thoroughly discredited foundation formula which at that time was believed to produce large school revenue disparities.

Legal Challenges to the School Finance System in the State of Kansas

The Kansas District Court in the case of Caldwell v. The State of Kansas held that Kansas' school finance system, which essentially is a locally financed, foundation system, violates the Fourteenth Amendment of the Federal Constitution as well as the Kansas Constitution.[38] The case was filed early in 1973 by Mr. Michele Caldwell, James Caldwell, and their friends as representatives of a class of plaintiffs. The case was decided on July 5, 1973.

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[37]Ibid., p. 227.

[38]Caldwell v. Kansas, No. 50616, P.C. Johnson County (decided July 5, 1973).

In order to have the complete factual basis for the decision, the court ordered the prevailing parties to offer the finds of fact to the court. The basic findings of fact found can be summarized as follows:

1. Under the foundation system, large disparities of expenditures per pupil have been produced. The operating expenditures per pupil ranged from a low of $516.23 per pupil to a high of $1,753.67 per pupil for the school year, 1970-71.

2. Under and pursuant to the Kansas school finance system, school districts having high adjusted valuations per pupil were capable of financing substantial budget expenditures per pupil at low operating tax levies. School districts having low assessed valuations per pupil had to exert a higher tax rate to finance their education at the level comparable to the amount of expenditures per pupil of high assessed valuation.

3. The economic index used in computing county ability is not necessarily an index to compute district ability. Districts which would have a low district economic index but being located in counties with a high county economic index, are penalized in the distribution of equalizing state aid.

4. County School Foundation Fund was designed to aid school districts with low adjusted valuations per pupil located within counties. However, this fund was produced by levying ten mills on the properties of the county and distributed to the school districts within the county. There is no equalization made among counties within the state.

5. The supplemental state aid was designed in part to equalize educational opportunities, the index for the purpose of distributing such aid was so computed that all districts with the adjusted valuation per pupil in excess of $18,000 had the same index, to-wit: .20, thus necessitating higher levies on tangible property in districts having low valuations per pupil and assisting low levies of taxes in districts with high valuation per pupil. If the index did not in fact stop at .20, more funds would be available for districts with low valuations per pupil.

6. Under the foundation system, no school districts would be permitted to budget an amount more than 105 percent of the amount legally budgeted for operating expenses in the preceding school year or, in the 1969-70 school year, whichever is greater. However, there are several exceptions to these restrictions. Upon approval by its voters, any district may increase its expenditure beyond these limits. The fact is that without a successful vote of the people of the district, school districts with low assessed valuation

> per pupil could not expend their budget to enrich the educational program of the district in excess of the 105 percent budget limitation.[39]

Based on these findings, the court ruled that education is a fundamental interest and wealth is a suspect classification under the equal protection guarantees of both the Kansas Constitution and the Fourteenth Amendment of the United States Constitution, and therefore, concluded that the present Kansas school financing system for elementary and secondary education which was not necessary to a compelling state interest and not rationally related to any legitimate state interest violated both the Kansas and United States Constitutions.

The Present State Aid Financing System in the State of Kansas

The General State Equalization in Kansas, passed by the 1973 legislature was prompted in part by the decision in Caldwell v. Kansas. The legislature responded with a finance system based on the concept of power equalization in order to narrow the variation of school revenue among school districts within the State of Kansas. The new system provided for the allocation of general state aid, county foundation fund, 25 percent of intangible tax, and a rebate of ten percent of the state's personal income tax paid by Kansas residents.

Under this new financing scheme, general state aid is basically determined by the local budget approved by the state board. Specifically general state aid for a district is computed by subtracting local revenue which is the product of district wealth (defined as the total of local property assessed valuation and personal income) and local effort rate,

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[39]Caldwell v. the State of Kansas, District Court of Johnson County, Kansas, No. 50616, Memorandum decision (July 5, 1973).

P.L. 874 Impact Aid, 25 percent of intangible tax, and the district share of county foundation tax from the approved district selected budget. The remainder is the amount of general state aid to which the district is entitled.[40] Local effort rate, in turn, is primarily determined by a locally selected budget. This varies with enrollment which is incorporated into the local effort rate at which the state matches local revenues. Under this financing system, a district's local effort rate is 1.5 percent if its budget per pupil (BPP) is the same as the "norm" BPP for its enrollment category. If a district's BPP is more or less than such "norm", its LER (local effort rate) is more or less than 1.5 percent in the same proportion that its BPP deviates from the "norm."[41] The formula for determining a district's LER is:

Local Effort Rate = (District's BPP/State Norm Budget for the District's Enrollment Category) x 1.5%

The enrollment categories and the state budget norm was specified by the law. For 1973-74, they were:

District Enrollment	Norm BPP	Adjustment
Under 400	$936	None
400-1299	$936	Minus $.23111 (enrollment-400)
1,300-over	$728	None

The inclusion of enrollment categories was designed to compensate for the presumed diseconomies of scale faced by small districts.[42]

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[40]Senate Bill No. 92, sec. 12, in Norton W. Grubb, New Programs of State School Aid (Berkeley: University of California, Childhood and Government Project, April 1974), p. 147.

[41]Senate Bill No. 92, op. cit., sec. 16.

[42]W. Norton Grubb, "The First Round of Legislative Reforms in the Post-Serrano World," p. 479.

The adjustment factor for the districts in the 400-1299 enrollment category was designed to prevent abrupt changes in the norm BPP between the lowest and middle, and the middle and highest enrollment categories.[43]

In addition to the adjustment factors which prevent abrupt change in a district's budget, there is another restriction on the rate of increase in the school district's budget. This feature attempts to narrow school revenue disparities over time. Under this new financing scheme, no districts shall budget or expend for operating expenses per pupil more than 115 percent of the amount of its budget per pupil in the preceding school year, or 105 percent of the median budget per pupil in the preceding school year of districts within the same enrollment category, whichever is less.[44] Thus, high spending districts would be restrained to a five percent per year increase, while low spending districts would be permitted a maximum 15 percent. Gradually, the disparities of school revenue among school districts would be narrowed. However, any district may be permitted to raise its budget for a particular year in an amount not to exceed 115 percent per pupil by vote of the electors of the districts. This permission may have some negative effects on narrowing the disparities of school revenue among school districts.

Moreover, the new finance system prescribed a minimum budget. No district shall budget in any year for operating expenses an amount less than six hundred dollars ($600) per pupil.[45] Therefore, any district

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[43]Legislative Research Department, Kansas. Results of 1973 School District Equalization Act--Local Effort Rates, State Aid Ratios, and Adjusted General Fund Tax Rates. Topeka, Kansas, 1974, p. 2.

[44]Senate Bill No. 92, op. cit., sec. 26(a).

[45]Ibid., sec. 26(b).

with a budget substantially lower than $600 may be authorized to increase its budget to $600 without being restricted by the maximum budget increase provisions.

In addition, under this new scheme, the declining enrollment factor was included. Since virtually all school districts in Kansas have declining enrollments, a formula for adjusting the legal maximum budget was used as a practical expediency. It was thought that it would be impractical to reduce a school district's budget in direct proportion to enrollment decreases, since a loss of students does not usually allow such a directly proportional budget reduction.[46]

The local budget may be permitted to remain at the level of the preceding year under this provision of budget control for districts with declining enrollment. Under this current system, if the enrollment in a district has declined less than a specified percentage, then the district budget may be computed on the basis of the enrollment in the previous year. The percentage applicable to a district for the purpose of the control of district's budget is ten percent for districts in the smallest enrollment category (under 400), 7.5 percent for districts in the middle enrollment category, and five percent for districts in the largest enrollment category.[47] However, if the enrollment declines at a rate greater than the specified percentage, the budget would be adjusted downward.

In summary, the new Kansas school financing program was designed to allocate state aid in inverse relation to the local property assessed

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[46]Legislative Research Department, op. cit., p. 34.

[47]Senate Bill No. 92, op. cit., sec. 26(d).

valuation as well as the aggregated personal income of the local district. The local school districts have been authorized to levy a local property tax, but have no power to tax personal income. However, the state would return ten percent of resident individual income tax to the local school districts. This added portion would be counted as part of local effort, and it cannot be used to increase the maximum budget, rather it must be used for the purpose of supplementing the local property tax. Since the local budget is determined prior to the tax rate, the Kansas power equalization program would be statutorily defined in terms of the district's budget rather than in terms of the tax rate. This is quite different from the systems in Illinois and Michigan.

Summary

Though the state financing system for public education in the three states in this study--Illinois, Michigan, and Kansas--differ, there are a number of similarities among them.

1. All three states revised their state aid program on the basis of district power equalization. (Although the Illinois financing system still retained its foundation plan, only seven percent of Illinois pupils were enrolled in the foundation plan school districts.)

2. All of these states have incorporated rather sophisticated adjustments to allocate state aid according to prevailing concepts of educational need. In particular, Illinois distributes additional aid for compensatory education, and Michigan considers municipal overburden, while Kansas includes an enrollment category to compensate for the presumed diseconomies of scale faced by small school districts.

3. Although each of these three states adopted a power equalization formula to allocate state aid to local school districts, the formulas in these three states still include local property assessed valuation as a variable to distribute state aid so that the low assessed valuation school districts can get more state aid than do the rich school districts. In Illinois, the guaranteed assessed valuations for unit, elementary, and high school districts respectively are $42,000, $64,615, and $120,000. In Michigan, the state equalized valuations specified in the formula for 12 grade districts for the school years 1973-74, 1974-75, and 1975-76 are $38,000, $39,000, and $40,000, respectively. In Kansas, however, the guaranteed assessed valuation per pupil are not specified, but assessed valuations are used in calculating the local effort which is subsequently subtracted from local budget. The higher the assessed valuation, the less the state aid is allocated.

4. In all three states the recapture provision often advocated in DPE program which requires wealthy districts to remit revenues to the state for reallocating purposes has not been included in their state funding systems.

5. In both Illinois and Michigan, the maximum allowances were specified, but conditional to the tax rate limit. In Illinois, the school districts having assessed valuation lower than the specified level may receive the maximum allowance, $1260, if the maximum tax rate (3.0 for unit, 1.95 for high, and 1.05 for elementary school district) is reached when the phase-in of the formulae is completed. In Michigan, when the school districts reach the maximum allocated tax rates (22 mills for 1973-74, 25 mills for 1974-75, and no limitation thereafter), they may achieve the maximum allowance $836 for 1973-74 and $975 for 1974-75.

In Kansas, there is no maximum allowance specified. Norm budget is suggested, but this is subject to annual revision.

6. In all three states, there are budget restrictions provisions which tend to narrow school revenue disparities among school districts. The restriction mechanisms vary from state to state. In Illinois, the ceilings on permissible tax rates are specified. School districts are not allowed to exceed these ceilings (3.0 for unit districts, 1.95 for high school districts, and 1.05 for elementary districts) unless they were exceeding $1260 per TWADA pupil in 1972-73 or where the board has passed a resolution to increase expenditures for innovative programs or research or experimental programs or other enriching experiences. If the ceiling is reached, school districts can increase expenditures by 15 percent for innovative programs or research or experimental programs or other enriching experiences by either voter approval or a backdoor referendum. In Kansas, no district can increase expenditure more than five percent of the previous year's median budget per pupil among districts in the same enrollment category or more than 15 percent of the previous year's budget per pupil, whichever is less. In Michigan, the limit is only a ceiling on the level of tax which is used for equalizing purposes. The tax rate ceiling is 22 mills for 1973-74, and 25 mills for 1974-75. For 1975-76 and after, districts are free to exceed these limits.

CHAPTER IV

DESIGN OF THE STUDY

Collection of Data

Since the purpose of the study was to determine the degree of improvement of school revenue equity resulting from changing the state aid funding system from a foundation system to a power equalization system in 1973 in Illinois, Michigan, and Kansas, three years' data were needed. These three years' data included one year before the reform and two years after the reform. Illinois data was provided by the Illinois Office of Education, while Michigan data was provided by the Office of Senator Gilbert E. Bursley. The Kansas data was provided by the "Intergovernmental Relations Committee National Conference of State Legislatures." However, the school enrollment figures for 1971-72, county foundation tax, supplemental state aid, and intangible property tax in 1972-73 were not included in data provided by "Intergovernmental Relations Committee National Conference of State Legislatures," but were obtained from school finance and statistics division in the Kansas State Department of Education.

Due to the variation in school financing systems among the three states, each state's reform was analyzed separately in terms of meeting reform goals. Following are the types of data collected for Illinois, Michigan, and Kansas for the 1972-74 school years.

The data for Illinois:

(a) District wealth--adjusted assessed valuation of property;

(b) District revenue--the product of operating tax rate and district wealth;

(c) General state aid;

(d) School revenue for school operating purpose--the combination of district revenue and state aid.

The data for Michigan:

(a) District wealth--adjusted assessed valuation of property;

(b) District revenue--the product of operating tax rate and district wealth;

(c) General state aid--including regular state aid plus grandfather clause allocation;

(d) School revenue for school operating purpose--the combination of district revenue and state aid.

The data for Kansas:

(a) District wealth--the total of adjusted assessed valuation of property and taxable income within the district;

(b) District revenue--including the following items:

(1) the product of district wealth and the district's local effort rate;
(2) federal impact aid--PL 874;
(3) district's share of the county school foundation fund;
(4) district's share of the intangible tax;

(c) General state aid--note that supplemental aid was added in 1972-73, but not available in 1973-74 and thereafter;

(d) School revenue for school operating purposes--the total of district revenue and general state aid.

Organization of the Data

All the data listed in the previous section were divided by the educational need units which were specified in the state grant-in-aid systems for state aid allocation purposes. In Illinois, TWADA (Title I weighted average daily attendance) served as the basic unit of educational need. The basic unit of educational need in Michigan was pupil membership, while in Kansas the basic unit of educational need was pupils

enrolled in the school district. In Kansas both the old foundation system and the new power equalization system provided a special consideration to the school districts where enrollment declined less than a certain limit and allowed them to use the amount of enrollment in the preceding school year for the current year budget computation and expansion. If the enrollment in a school district in the current school year decreased more than the specified limit, current school enrollment could be used in the computation of district budget. In the old foundation system, a ten percent declining limit was specified for all enrollment categories of school districts. In the new power equalization formula, different limits were specified for different enrollment categories of school districts. The limit applicable to a school district was ten percent for districts in the smallest enrollment category (under 400), 7.5 percent for districts in the middle enrollment category (between 400 and 1299), and five percent for districts in the largest enrollment category (1300 and over). Due to this special consideration of the declining enrollment effect on district budgets, the data in Kansas were divided by the preceeding enrollment for the current year if the school districts had declining enrollment less than the specified percentage. In Kansas, 205 school districts in 1972-73, 213 school districts in 1973-74, and 197 school districts in 1974-75 had declining enrollment less than the specified percentage. Hence, the enrollment data of the previous year were used for the then current year's analysis for those school districts.

The Study Populations

No sampling was employed in this study. For all parts of the analysis in the study, the entire populations of school districts in

Illinois, Michigan, and Kansas were used. The following chart provides a breakdown of school districts by type and by size which the data were obtained for analysis.

TABLE 4

THE STUDY POPULATION

School Year	Illinois			Michigan	Kansas		
	Elem.	High	Unit	Unit	Under 400	400-1299	1300 & over
1972-73	501	143	436	599	65	177	67
1973-74	476	135	442	596	68	174	67
1974-75	476	134	442	592	69	173	66

The school districts in Illinois, Michigan, and Kansas are classified differently. The chart shows Illinois school districts by type (elementary, high, and unit districts), the Michigan school districts as all unit districts, and the Kansas unified school districts by size of student enrollment. Kansas school districts were grouped by size because the new Kansas state aid formula was designed to compensate for the presumed diseconomies of scale faced by the small school districts. Different norm budgets, adjustment factors, and declining enrollment limitations were specified for each enrollment category in computing the local effort rate and allocating state aid under the new Kansas school financing system.

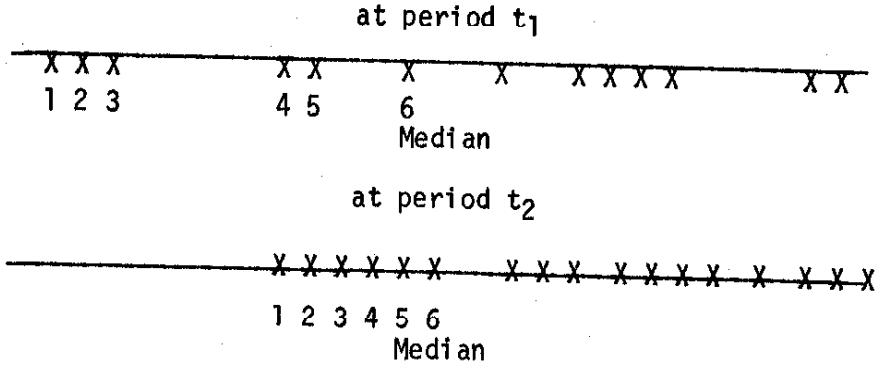
Evaluative Criteria and Statistical Design

School revenue equity was defined in terms of the criteria of permissible variance and fiscal neutrality. The criteria of permissible

variance requires narrower variation of school revenue per educational need unit among school districts within a state, while the criteria of fiscal neutrality calls for the reduction of dependence of school revenue per educational need unit upon district wealth. Essentially, two measures were applied to determine the dispersion of school revenue distribution for the criteria of permissible variance--the coefficient of variation and the McLoone Index. The coefficient of variation focused on the entire population of school revenue distribution and was computed by dividing the mean by the standard deviation and multiplying by 100:

$$\text{Coefficient of Variation} = \frac{\text{standard deviation}}{\text{mean}} \times 100$$

The McLoone Index focuses not on the entire school revenue distribution, but on the distribution below the median.[1] The purpose of the McLoone Index was to lift school revenue per educational need unit in the districts upward and closer toward the median. Graphically, this concept can be expressed as follows:



[1]Eugene P. McLoone, Profiles in School Support: 1969-70 (National Center for Educational Statistics, 1974, Washington, D.C.: U.S. Government Printing Office).

School revenue per educational need unit in districts 1 through 5 are far below the median school revenue per educational need unit in district 6 at period t_1. The McLoone concept attempts to allocate more dollars to the districts which have school revenue below the median to move those districts toward the median position. The disadvantage of the McLoone approach is the lack of attention to the rich school districts' position in the entire distribution of school revenue. The McLoone index for this study was calculated by the formula as follows:

$$\text{McLoone Index} = \frac{\text{Total school revenue below the median}}{\text{Total school revenue below the median} + \text{total deviation from the median}}$$

For the criteria of fiscal neutrality, the Gini Index and regression analysis were used in determining the degree of dependence of school revenue upon district wealth. In addition, the Gini Index also takes into consideration the entire distribution of school revenue and is related in form to the well-known Lorenz curve. Traditionally, a Lorenz curve shows cumulative proportions of aggregate school revenue accruing to the cumulative proportion of districts educational need units. Hickrod and his associates have added a new version on the usual application of the Lorenz curve presentation.[2] That is, the school districts would be sorted from poor to rich in terms of district wealth. In such an ascending order, the equity of a state's distribution of school revenue would then be displayed by plotting a cumulative percentage of aggregate school revenue against the cumulative proportion of a district's educational need units. Graphically, it can be expressed as follows:

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[2]Alan G. Hickrod, Thomas Yang, Ben C. Hubbard, and Ramesh Chaudhari, "Measurable Objectives for School Finance Reform: A Further Evaluation of the Illinois School Finance Reforms of 1973," p. 47.

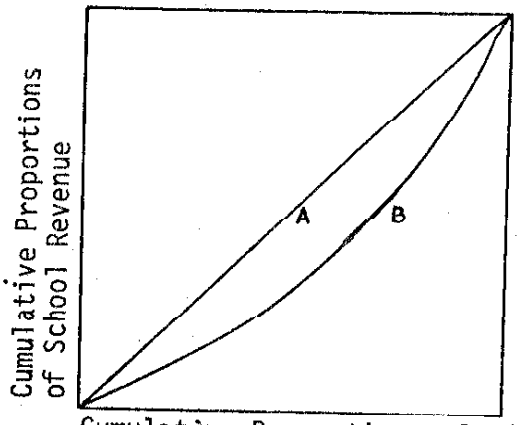

Figure 1.--The Lorenz Curve

The revised version which ranks school districts by wealth provices the extra information about the extent to which differences in school revenues are correlated with differences in district wealth. Based on this modified Lorenz curve, the extent of inequity of school revenue with respect to district wealth can then be seen by the amount of deviation of the plotted curve from the straight line (45 degree line). If the plotted curve shifts to the right, the amount of variation would positively be increased. The positive increase in amount of variation would indicate the increasing dependence of school revenue upon district wealth and increasing district revenue disparities among the school districts. If all educational need units in school districts within a state receive the same amount of school revenues, the plotted curve will coincide with the 45 degree line (line of perfect equity). If not, the plotted curve could be either above or below the line of equity, depending on the nature of the distribution of school revenues. If the general state aids are allocated inversely to wealth in a state with large district wealth disparities, the plotted

curve for state aid could be shifted upward toward the line of perfect equity.

For the purposes of simplicity and of having a single index expressing the distance from the plotted line to the line of perfect equity, the Gini index was used. The Gini index can be measured in the graph of Lorenz curve by the ratio of area A and area A+B. Arithmatically, Gini index can be calculated with the following formula:

$$G = \sum_{i=2}^{n} (X_{i-1}Y_i - X_iY_{i-1})$$

where:

Y = revenues, and
X = pupils in the district.

When the Gini index is equal to 1.0, complete inequity exists. When Gini index is equal to 0.0, the complete equity is achieved. The advantage of using Gini index is that it avoids the undue squared difference influence of high income class frequencies and is independent of the measure of central tendency.[3]

For the purpose of netting out the effect of the district revenue and state aid distribution on the entire distribution of school revenue, the Lorenz curve and the Gini index can be further modified in a way by adding the components of total school revenue on the vertical axis successively. The effect of changing the Gini index or shifting the position of the Lorenz curve can be identified as a result of the added component of school revenue. For the purpose of clarity, Figure 2 shows district wealth disparities measured by the Lorenz curve.

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[3]Lee Soltow, "The Distribution of Income Related to Changes in the Distributions of Education, Age, and Occupation," The Review of Economics and Statistics 42 (November 1960):450-53.

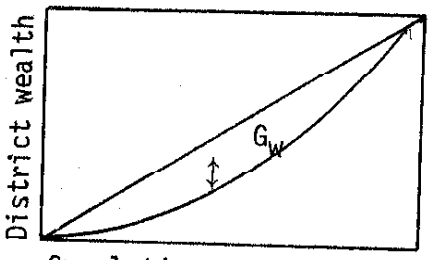

Figure 2.--District wealth disparities

In Figure 2, district wealth is placed on the vertical axis. The number of educational need units is placed on the horizontal axis and ranked in ascending order by wealth. Thus, the Gini index (G_W) can be viewed as an index for the disparities of district wealth. By the same notion, district revenue can be placed on the vertical axis against educational need units in the horizontal line. The shift of the Lorenz curve demonstrates the effect of the compositions of local revenue and property tax rate. Holding other things constant, except tax rate, the shift of the Lorenz curve can be viewed as a result of variation of tax rate among the school districts. When state aid is added to district revenue, the downward or upward movement can be viewed as the effect of the state aid distribution. Continuing this adding process, various effects can be shown in Figure 3.

Figure 3 indicates the tax variation effect (or district revenue component effect) and state aid distribution effect. With respect to the tax variation effect, holding other things constant, the shift of the Lorenz curve toward the 45 degree line may indicate the higher effort exerted in the poorer school districts and conversely the lesser tax

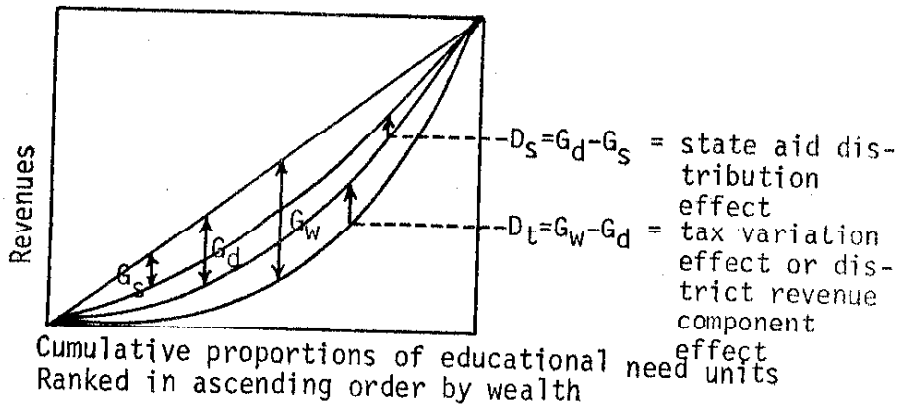

Figure 3.--Tax variation effect and state aid distribution effect

G_s: Gini index for the school revenue disparity
G_d: Gini index for the district revenue disparity
G_w: Gini index for the district wealth disparity
D_t: tax variation effect on the reduction of district revenue disparity
D_s: State aid distribution effect on the reduction of school revenue disparity

effort exerted in the rich school districts. By the same token, if the state aid is allocated inversely in relation to district wealth, the Lorenz curve would be shifted upward toward the straight line. This indicates the effect of state aid distribution on the reduction of school revenue disparity and of dependence of school revenue upon district wealth. Since the purpose of the study was to examine the effect of changing the state aid financing system on school revenue equity, the effect of state aid is the focus of Chapter V.

An alternative measure of fiscal neutrality suggested by Michelson and Feldstein is to use regression analysis. According to Feldstein, the wealth elasticity of school spending can serve as a measure of the degree

of wealth neutrality or non-neutrality that has been achieved.[4] In Feldstein's regression, the log-linear relationship between school spending per educational need unit and wealth per educational need unit was applied. The relation can be written as follows:

$$\text{Log } E_i = a + b \text{ Log } W_i + u_i \quad \text{where:}$$

a= an intercept
u_i= a residual that is orthogonal to Log W_i

The parameter b measures wealth neutrality; complete wealth (or fiscal) neutrality requires b = 0. The large value of wealth elasticity b may indicate the heavy dependence of school revenue on district wealth. In applying Feldstein's regression to the parallel regression analysis used in Miner's social and economic factors study[5] and further recommended by Michelson,[6] the component effect of school revenue can be identified. Graphically, the parallel regression analysis can be expressed as follows:

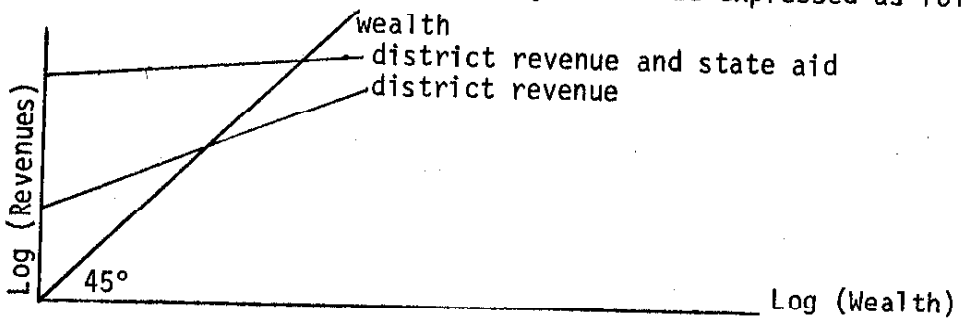

Figure 4. Parallel Regression analysis

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[4]Martin S. Feldstein, "Wealth Neutrality and Local Choice in Public Education," The American Economic Review (March 1975), p. 77.

[5]J. Miner, Social and Economic Factors in Spending for Public Instruction (New York: Syracuse University Press, 1963).

[6]Stephan Michelson, "What is a 'Just' System for Financing Schools? An Evaluation of Alternative Reforms," Law and Contemporary Problems 38 (Winter-Spring 1974):436-458.

In the graph, the logarithmic transformation are applied to both the dependent and the independent variables. The nature of the dependent variables are changed each time. First, wealth per educational need unit is regressed on wealth per educational need unit itself. The regression line is the line with 45 degrees. Secondly, district revenue is regressed on wealth per educational need unit. The wealth elasticity in the district revenue log-regression function may be less than 1.00; it all depends upon the nature of the distribution of district revenue and the factors affecting the distribution. Thirdly, state aid is added to district revenue and regressed on wealth per educational need unit. The wealth elasticity in the state aid and district revenue function may be less than the wealth elasticity in the district revenue function. It, again, depends upon the nature of the state aid distribution. If state aid is allocated to the districts in inverse relation to district wealth, the wealth elasticity in the state aid plus district revenue functions would be less than the elasticity in the district revenue function. The difference between the wealth elasticity in the district revenue function and the wealth elasticity in the state aid and district revenue functions can be viewed as the effect of the state aid distribution.

In summary, two statistical methods were applied in this study to measure the permissible variance. These two methods were (1) coefficient of variation and (2) the McLoone index. The former focuses on the entire distribution of school revenue, while the latter focuses on the distribution below the median. For the criteria of fiscal neutrality, the Gini index and regression analysis were applied to the data. The Gini index measured a concentration of frequency distribution of school revenue in relation to district wealth, while the regression method measured the degree of dependence of school revenue upon district wealth.

CHAPTER V

RESULTS, SUMMARY, CONCLUSIONS, AND FURTHER RESEARCH RECOMMENDATION

This chapter presents a detailed description of the results from statistical analysis which applied the evaluative criteria established in Chapter I to the three years' data for Illinois, Michigan, and Kansas. The statistical results are reported in two sections: (1) Permissible Variance criteria and (2) Fiscal Neutrality criteria. Under each criteria, two statistical analyses were applied to the data, and the results for each statistical analysis will be discussed in turn. Finally, this chapter includes a summary of evaluative statements provided within the limitation of this study and a recommendation for further research. Before presentation of the results, it should be stressed that the 1973 reforms have four year phase-in periods in Illinois and three year phase-in periods in Michigan. The results shown in the following sections are short-run results which contained only the first two years of the reform and may well not be the end result of the reform.

Permissible Variance Criteria

As indicated in Chapter I, two statistical methods were employed under this criteria in computing the variance of school revenue distribution within a state. The first method is "coefficient of variation," which focuses on the entire distribution of school revenue. The second method is the McLoone index which requires a focus not upon the entire distribution but rather upon the distribution below the median school

revenue. The results of these two methods will be examined in the following subsections: (1) coefficient of variation and (2) McLoone index.

Coefficient of Variation

The results of the coefficient of variation are presented for Illinois, Michigan, and Kansas, respectively.

The Results for Illinois. Table 5 provides the data for the coefficient of variation for the elementary school districts in the State of Illinois.

TABLE 5

PERMISSIBLE VARIANCE CRITERION: COEFFICIENT OF VARIATION FOR ILLINOIS ELEMENTARY SCHOOL DISTRICTS

	1972-73	1973-74	1974-75
District Wealth	94.9282	95.3301	97.0810
District Revenue	65.3955	64.9081	66.7358
District Revenue and State Aid	29.4404	26.9674	28.2265
State Aid Effect on Equity	54.981%	58.453%	57.704%

It can be seen in Table 5 that the variation of district wealth per TWADA (in Illinois, district wealth is defined in terms of property assessed valuation and TWADA serves as a measure of educational need unit) increased during all three years. This increasing high disparity of district wealth contributed to high district revenue disparities. District local revenue disparity remained at a high level from the beginning to the end of the study. When state aid was added to the district revenue, however, the coefficients of variation in state aid and district (local)

revenues per TWADA decreased from 29.4404 in 1972-73 to 26.9674 in 1973-74, but it increased thereafter. Table 5 shows the state aid distribution effect on the movement toward the goal of narrowing the variation of school revenue per pupil among the school districts within a state, which is defined under the criteria of permissible variance. The "state aid distribution effect" was calculated by subtracting the coefficient of variation for district revenue from the coefficient of variation for the combined district revenue and state aid and dividing the result by the district revenue variation coefficient. The state aid distribution effects were reported in percentages indicating that the percentage of reduction of school revenue variation was due to the inclusion of the state aid distribution factor. The increasing trend shown in Table 5 indicates that state aid was allocated inversely to the poor school districts which lack financial resources in 1973-74 and 1974-75 than in 1972-73. Thus, state aid distribution has a more equalizing effect. The effect of state aid distribution in Illinois elementary school districts appears to be larger again in the first year of the reform than in the second year. It should also be noted that in spite of increasing disparity in local wealth and local revenue, the state aid was able to offset these trends and cause a reduction in state aid plus district revenue variation.

Table 6 provides the data on the coefficient of variation for Illinois high school districts. The coefficient of variation for district wealth per TWADA in Illinois high school districts are approximately half as large as the coefficient of variation in Illinois elementary school

districts. This would be expected since larger geographic units normally show less variation. The district revenue disparity still remains large and has not been reduced. The coefficient of variation for the district revenue and state aid, however, show improvement due to the effect of the state aid distribution. The state aid effect on the movement toward the goal of the reduction of school revenue variations increased from 30.852 percent in 1972-73 to 41.778 percent in 1974-75.

TABLE 6

PERMISSIBLE VARIANCE CRITERION: COEFFICIENT OF VARIATION FOR ILLINOIS HIGH SCHOOL DISTRICTS

	1972-73	1973-74	1974-75
District Wealth	50.7121	50.4520	50.5981
District Revenue	40.7686	40.6129	41.6655
District Revenue and State Aid	28.1906	25.3338	24.2582
State Aid Effect on Equity	30.852%	37.621%	41.778%

For Illinois unit school districts, the variation per TWADA of district wealth and of district revenue in Table 7 were approximately the same as the variation in the Illinois high school districts, which again would be expected since they are of similar geographic size. No noticeable reduction of variation of either district wealth or district revenues was evident after the reform of the state aid financing system.

The coefficients of variation for the district revenue with state aid were also computed. These coefficients demonstrate a decreasing trend in Table 7. The district revenue plus state aid variation coefficients were slightly reduced (from 14.7044 in 1972-73 to 13.4112

in 1974-75. The "state aid effect" also shows an upward trend in the table. This indicates that a slightly greater effort in equalizing school revenue per TWADA has been made by the new reform of the state aid funding system.

TABLE 7

PERMISSIBLE VARIANCE CRITERION: COEFFICIENT OF VARIATION FOR ILLINOIS UNIT SCHOOL DISTRICTS

	1972-73	1973-74	1974-75
District Wealth	48.8246	48.3566	48.5209
District Revenue	42.2743	42.2209	42.6614
District Revenue and State Aid	14.7044	13.4378	13.4112
State Aid Effect on Equity	65.216%	68.172%	68.564%

The Results for Michigan. Michigan, unlike Illinois, has only unit school districts. Table 8 presents the coefficient of variation in revenues, the state aid distribution effect, and the grandfather clause effect for the Michigan unified school districts.

Both the coefficient of variation of district wealth per educational need unit and the variation coefficient of district revenue per educational need unit in 1972-73 in Table 8 are approximately equivalent to the coefficients for Illinois elementary school districts. The downward trend is not shown in Illinois elementary school districts in wealth variation and district revenue variation seems to be apparent in Michigan unified school districts. The district revenue variation for Michigan unified school districts declined from 60.0911 in 1972-73 to 53.5129 in 1974-75. Table 8 also indicates that the coefficient of variation for

TABLE 8

PERMISSIBLE VARIANCE CRITERION: COEFFICIENT OF VARIATION FOR MICHIGAN SCHOOL DISTRICTS

	1972-73	1973-74	1974-75
District Wealth	95.2879	84.0871	82.2179
District Revenue	60.0911	56.1271	53.5129
District Revenue and State Aid	27.6828	20.8641	19.7063
District Revenue and State Aid and Grandfather Clause Allocation	Not Available	19.1788	19.5043
State Aid Effect on Equity in Percentage-wise	53.932%	62.827%	63.175%
Grandfather Clause Allocation Effect on Equity	Not Available	3.003%	0.377%

district revenue and state aid per educational need unit was reduced by approximately 8.00 in 1974-75 compared to the 1972-73 coefficient of variation. If adding the additional state aid allocated by the grandfather clause which gave special consideration to the declining property assessed valuation school districts and lower tax rate school districts, then the coefficient of variation in state aid plus district revenue was further reduced to 19.5043 in 1974-75 from 27.6828 in 1972-73. With respect to the state aid effect on the movement of the Michigan financing system toward the goal of the premissible variance, Table 8 shows the impact of this movement in 1974-75. Adding the grandfather clause allocation to the computation, further increases the effect of total state aid distribution on the movement toward the goal of permissible variance. The increasing total state aid effect indicates that a positive effect in reducing the variation of school district revenue per educational need unit was made by the inclusion of the grandfather clause allocation.

The Results for Kansas. The new state aid formula in Kansas was designed to compensate for the presumed diseconomies of scale faced by small school districts. The school districts were sorted into three categories: (1) school districts with under 400 pupils, (2) school districts with between 400 and 1299 pupils, and (3) school districts with 1300 pupils and over. Different norm budgets and adjustment factors were specified by the 1973 Kansas school district equalization act for each enrollment category in computing the local effort rate and allocating state aid. Because of this different treatment for different enrollment categories, the analysis of the data was made for each enrollment category district, and the results are reported in the same fashion.

Table 9 contains the data on the coefficient of variation for the school districts with under 400 pupils. The coefficient of variation in district wealth per educational need unit (district wealth were defined as the total of personal income and adjusted property assessed valuation) remained relatively unchanged between 1972-73 and 1974-75. District revenue disparities increased in the first year of the Kansas reform, but decreased thereafter.

TABLE 9

PERMISSIBLE VARIANCE CRITERION: COEFFICIENT OF VARIATION FOR KANSAS SCHOOL DISTRICTS (UNDER 400 PUPILS)

	1972-73	1973-74	1974-75
District Wealth	40.704	40.895	39.586
District Revenue	33.067	37.802	35.434
District Revenue and State Aid	24.594	23.586	22.602
State Aid Effect on Equity	25.623%	37.607%	36.213%

The downward trend of the coefficient of variation with regard to district revenue plus state aid are shown in Table 9. The state aid effect in achieving the goal of permissible variance appeared greater in the school years after the reform than in the year before the reform.

The results for Kansas school districts with between 400 and 1299 students are reported in Table 10.

TABLE 10

PERMISSIBLE VARIANCE CRITERION: COEFFICIENT OF VARIATION FOR KANSAS SCHOOL DISTRICTS (400-1299 PUPILS)

	1972-73	1973-74	1974-75
District Wealth	39.578	39.927	42.493
District Revenue	30.302	46.041	44.208
District Revenue and State Aid	21.263	17.571	16.053
State Aid Effect on Equity	29.829%	61.837%	63.688%

The coefficients of variation in both district wealth per educational need unit and district revenue per educational need unit remained moderately high. The upward trend of the coefficient of variation in district revenue can be seen in Table 10. Disregarding the increase of the coefficient of variation in district revenue, there was a downward trend of the coefficient of variation in the district revenue plus state aid. Kansas made a great effort in reducing the school revenue variations among the school districts with between 400 and 1299 students. This great effort can be observed in the increases of state aid effect on the movement toward the goal of permissible variance.

Table 11 provides the data on the coefficients of variation for the Kansas school districts with enrollments of over 1300 pupils.

TABLE 11

PERMISSIBLE VARIANCE CRITERION: COEFFICIENT OF VARIATION FOR KANSAS SCHOOL DISTRICTS (1300 AND MORE PUPILS)

	1972-73	1973-74	1974-75
District Wealth	34.562	33.975	35.545
District Revenue	23.580	35.175	35.131
District Revenue and State Aid	13.714	11.239	9.941
State Aid Effect on Equity	41.841%	68.147%	71.704%

Both the coefficients of variation in district wealth and district revenue were slightly lower than the coefficients of variation for school districts with enrollment between 400 and 1299 pupils. However, the district revenue variation seemed to be increasing at a faster rate during the first year of the reform and remained relatively stable in the second year. Similar to the results for school districts with enrollments between 400 and 1300 pupils, the school state plus district revenue variations noticeably decreased from 13.714 in 1972-73 to 9.941 in 1974-75. The state aid allocation also had a greater impact on the movement toward the goal of permissible variance (defined in terms of coefficient of variation) during the reform years than in the year before the reform.

McLoone Index

The second set of three tables, Tables 12 through 14, present McLoone indexes for Illinois, Michigan, and Kansas. The main focus of the McLoone index is on the distribution of school revenue below the median, rather than on the entire distribution of school revenue.

The Results for Illinois. Table 12 provides the data on the McLoone index for all types of school districts in Illinois. There

appears to have been some improvement in the unit and high school districts after the 1973 reform. In the elementary school districts, a downward trend was observed. The McLoone index, 0.89152 in 1972-73, decreased to 0.84688 in 1974-75. This decrease in the McLoone index in Illinois elementary school districts suggests that system reformers and policy makers may wish to pay special attention to the poorest school districts.

TABLE 12

PERMISSIBLE VARIANCE CRITERION: McLOONE INDEX FOR ILLINOIS SCHOOL DISTRICTS

Year	Unit		High		Elementary	
	McLoone Index	Median	McLoone Index	Median	McLoone Index	Median
1972-73	0.90299	$798	0.82809	$928	0.89152	$764
1973-74	0.91913	$862	0.84944	$996	0.87665	$851
1974-75	0.92161	$910	0.85903	$1099	0.84688	$944

The Results for Michigan. As was the case in Illinois elementary school districts, a downward trend was observed in Michigan unified districts. The McLoone index, 0.92077 in 1972-73, decreased to 0.90646 in 1974-75. This decrease in the McLoone index indicates that no progress was made in the 1973 reform in lifting many poor school districts closer to the target level--the median of school revenue per pupil, and suggests, again, that policy makers may wish to pay special attention to the position of the poorest districts in Michigan.

TABLE 13

PERMISSIBLE VARIANCE CRITERION: McLOONE INDEX FOR MICHIGAN SCHOOL DISTRICTS

	1972-73	1973-74	1974-75
McLoone Index	0.92077	0.90104	0.90646
Median of School Revenue per Pupil	$758	$849	$936

The Results for Kansas. McLoone indexes for all types of enrollment category school districts in Kansas are presented in Table 14. An upward trend in the McLoone indexes for the second and the third category districts indicate that the McLoone index increased, and that many poor school districts were moved toward the target spending level, e.g., the median expenditure. For the smallest category, districts with enrollments under 400 pupils, the McLoone index was increased in the first year of the reform, but decreased in the second year of the reform. The largest movement toward the target level was found in the second category districts with enrollments between 400 and 1299, followed immediately by the third district category with 1300 and over, and finally by the first category districts of under 400 pupils.

TABLE 14

PERMISSIBLE VARIANCE CRITERION: McLOONE INDEX FOR KANSAS SCHOOL DISTRICTS

	Under 400 Pupils		400-1299 Pupils		1300 & More Pupils	
	McLoone Index	Median	McLoone Index	Median	McLoone Index	Median
1972-73	0.86137	$1193	0.86390	$834	0.94777	$694
1973-74	0.88857	$1173	0.89789	$863	0.94951	$755
1974-75	0.87912	$1315	0.91646	$963	0.96414	$856

Fiscal Neutrality Criterion

The criteria of "fiscal neutrality" can be stated as follows: school revenue levels should not be dependent upon the district wealth but rather on the wealth of the state as a whole. In measuring fiscal neutrality, two statistical methods were employed. One method, the Lorenz curve and Gini index, show an empirical distribution of school revenues in a state among the educational need units ranked from poor to rich in terms of district wealth. The other method used was regression analysis, in which the complete neutrality requires wealth elasticity equal to zero. The state aid effect on the movement toward the goal of fiscal neutrality was also examined. When using the Gini index, the state aid effort can be identified as the difference between the Gini index for district revenue and the Gini index for the combined district revenue and state aid in the district revenue and state aid equation. When using the regression analysis, the state aid effect is identified as the difference between wealth elasticity in the district revenue regression equation and wealth elasticity in the district revenue plus state aid equation. The greater the difference (expressed in percentages), the greater the impact of state aid on the movement toward the goal of fiscal neutrality. The results for the criteria of fiscal neutrality are presented in the following two subsections: (1) Gini index and (2) Wealth elasticity.

Gini Index

The third set of seven tables, Tables 15 through 21, provide Gini indexes or coefficients for Illinois, Michigan, and Kansas.

The Results for Illinois. Table 15 contains the Gini indexes for district wealth, district revenue, and the district revenue plus state

aid for Illinois elementary school districts.

TABLE 15

FISCAL NEUTRALITY CRITERION: GINI INDEX FOR ILLINOIS ELEMENTARY SCHOOL DISTRICTS

	1972-73	1973-74	1974-75
District Wealth	0.2703	0.2665	0.2702
District Revenue	0.2665	0.2646	0.2629
District Revenue and State Aid	0.0995	0.0848	0.0727
State Aid Effect on Equity	62.664%	67.952%	70.392%

Gini indexes for both district wealth and district revenue remained relatively stable in all three years. This indicates that district wealth and district revenue were about as unequal in the second year of the reform as they were during the year before the reform. When adding the state aid to district revenue, the Gini index decreased to 0.0727 in 1974-75 from 0.0995 in 1974-75. This downward movement indicates a greater progress made toward the goal of fiscal neutrality for Illinois elementary school districts. With regard to state aid distribution effect on equity in this downward movement of Gini index, it appeared to be greater in 1973-74 and 1974-75 than in 1972-73. This was shown by the successively smaller positive values for district revenue and state aid Gini indexes relative to district revenue Gini indexes.

For Illinois high school districts, Table 16 shows that district wealth Gini indexes and district revenue Gini indexes were relatively small compared to the Gini indexes of district wealth and of district revenue in elementary school districts. Gini indexes for district revenue and state aid show a steady progress made toward the goal of fiscal

neutrality from 1972-73 to 1974-75. This might have been due to the increasing distributive power of state aid funding reform. The increasing effect of state aid distribution can be seen in Table 16. The effect was 37 percent in 1972-73 and 50 percent in the second year of the reform.

TABLE 16

FISCAL NEUTRALITY CRITERION: GINI INDEX FOR ILLINOIS HIGH SCHOOL DISTRICTS

	1972-73	1973-74	1974-75
District Wealth	0.1687	0.1683	0.1677
District Revenue	0.1528	0.1540	0.1513
District Revenue and State Aid	0.0961	0.0844	0.0756
State Aid Effect on Equity	37.107%	45.000%	50.033%

Table 17 provides the data on Gini indexes for Illinois unit school districts. It appears that district wealth became more unevenly distributed over the three year period. This indicates that unit school district wealth in Illinois increased in disparity with the passage of time.

TABLE 17

FISCAL NEUTRALITY CRITERION: GINI INDEX FOR ILLINOIS UNIT SCHOOL DISTRICTS

	1972-73	1973-74	1974-75
District Wealth	0.1154	0.1162	0.1482
District Revenue	0.0885	0.0888	0.1045
District Revenue and State Aid	0.0345	0.0265	0.0143
State Aid Effect on Equity	61.017%	70.157%	86.315%

The increasing values of Gini indexes for district revenue indicates that district revenue disparities seemed to become larger in 1974-75 than in 1972-73. The increasing district revenue disparities might be partly due to the increasing disparities of district wealth. Regardless of the greater district local revenue disparities, a remarkable improvement was made in reducing the disparities of district revenue with state aid and, hence, the state moved closer toward the goal of fiscal neutrality. Clearly the movement toward the goal of fiscal neutrality resulted from the reform.

The Results for Michigan. Table 18 presents the Gini indexes for Michigan unified school districts. Both district wealth Gini indexes and district revenue Gini indexes remained relatively stable over the period from 1972-73 to 1973-74. The value of Gini indexes for district revenue, however, were greater than the value for district wealth. With respect to the state aid effect on the movement toward the goal of fiscal neutrality, Gini indexes in Table 18 show that a significant movement was made toward the goal of fiscal neutrality in all three years. The state aid effect in 1973-74 and 1974-75 was relatively stronger than the state aid effect in 1972-73. With the addition of grandfather clause allocation, state aid effect increased by another half percent toward the goal of fiscal neutrality.

The Results for Kansas. Gini indexes in Table 19 show that the distribution of district wealth was as unequal at the end of the study period as at the beginning for Kansas school districts with pupils under 400. A noticeable change was shown in the distribution of district revenue. A trend toward increasing district revenue disparity did not

TABLE 18

FISCAL NEUTRALITY CRITERION: GINI INDEX FOR MICHIGAN SCHOOL DISTRICTS

	1972-73	1973-74	1974-75
District Wealth	0.2059	0.2034	0.2046
District Revenue	0.2228	0.2191	0.2192
District Revenue and State Aid	0.0562	0.0465	0.0444
District Revenue and State Aid and Grandfather Clause Allocation	Not Available	0.0450	0.0444
State Aid Effect on Equity in Percentage-wise	74.775%	78.777%	79.745%
Grandfather Clause Allocation Effect on Equity	Not Available	0.684%	0.000%

TABLE 19

FISCAL NEUTRALITY CRITERION: GINI INDEX FOR KANSAS SCHOOL DISTRICTS (UNDER 400 PUPILS)

	1972-73	1973-74	1974-75
District Wealth	0.1997	0.1962	0.1973
District Revenue	0.1407	0.1955	0.1892
District Revenue and State Aid	0.0961	0.0816	0.0835
State Aid Effect on Equity	31.698%	58.261%	55.867%

offset the strong Kansas effort on the movement toward the goal of fiscal neutrality. The magnitude of Gini indexes for district revenue with state aid decreased from 0.0961 in 1972-73 to 0.0835 in 1974-75. The impact of state aid distribution on equity was largely increased from a low level in 1972-73 to a relatively high level in 1974-75.

The results of the Gini index for Kansas school districts (400-1299 enrollment) are presented in Table 20.

TABLE 20

FISCAL NEUTRALITY CRITERION: GINI INDEX FOR KANSAS SCHOOL DISTRICTS (400-1299 PUPILS)

	1972-73	1973-74	1974-75
District Wealth	0.2033	0.2058	0.2226
District Revenue	0.1454	0.2362	0.2398
District Revenue and State Aid	0.0924	0.0775	0.0711
State Aid Effect on Equity	36.451%	67.188%	70.075%

The changes in district wealth disparity are shown in the above table. District revenue seems to become more unevenly distributed in the reform years than in the year before the reform. In spite of more unevenly distributed district revenue, the movement of the Gini index values over the years of the study show clearly the distributional impact of the reform. The state aid distribution effect on equity in 1974-75 was twice as large in 1972-73. A marked improvement was made toward the goal of fiscal neutrality.

Gini indexes for district wealth in Kansas school districts with pupils 1300 and more, presented in Table 21, indicate only slight change in the distribution of district wealth. Like the results of district disparity in the first and second enrollment category districts, the disparity of district revenue seems to have increased in 1974-75 over 1972-73. In spite of more unequal district (local) revenue distribution, the Gini indexes for district revenue with state aid appeared to be smaller at the end of the study period than at the beginning. A

noticeable state effort was made in reducing large district revenue disparity and hence the state moved toward the goal of fiscal neutrality.

TABLE 21

FISCAL NEUTRALITY CRITERION: GINI INDEX FOR KANSAS SCHOOL DISTRICTS (1300 AND MORE PUPILS)

	1972-73	1973-74	1974-75
District Wealth	0.1335	0.1326	0.1419
District Revenue	0.0671	0.1217	0.1302
District Revenue and State Aid	0.0330	0.0290	0.0250
State Aid Effect on Equity	50.819%	76.171%	80.798%

Wealth Elasticity

The last set of seven tables, Tables 22 through 28, show wealth elasticities for Illinois, Michigan, and Kansas. Wealth elasticity is measured by the log-linear relationship between revenues per educational need unit and wealth per educational need unit. A complete fiscal neutrality requires wealth elasticity equal to zero.

The Results for Illinois. A logarithmic transformation was applied to the Illinois data on the district revenue equations and the total of district revenue with state aid equations. In district wealth regression, wealth elasticity was fixed and had value of 1.00. The wealth elasticities in the district local revenue function for Illinois elementary districts presented in Table 22 are less than 1.00. This indicates that district local revenue shifted away from fiscal neutrality and were more

dependent upon district wealth. In 1974-75, a one percent increase in district wealth would lead to a 0.9176 percent increase in district revenue. This heavy dependence on district wealth was significantly reduced after the infusion of the state aid distribution.

TABLE 22

FISCAL NEUTRALITY CRITERION: REGRESSION APPROACH FOR ILLINOIS ELEMENTARY SCHOOL DISTRICTS

	1972-73	1973-74	1974-75
District Wealth	1.00000	1.00000	1.00000
District Revenue	0.90838	0.91657	0.91760
District Revenue and State Aid	0.27679	0.24592	0.23293
State Aid Effect on Equity	69.529%	73.169%	74.615%

In the district revenue plus state aid log-regression equations, the downward sloping indicated that state aid distribution moved the state closer toward the goal of fiscal neutrality.

Wealth elasticities in revenue log-regression equations are presented in Table 23 for Illinois high school districts. The elasticities of district revenue with respect to district wealth are relatively high and increased with the passage of time. The high level of wealth elasticities show great influence of district wealth on per TWADA district revenue.

In Table 23 the wealth elasticities declined when state aid was added into the log-regression equation. Upon comparison among wealth elasticities in the three years under investigation, the trend was downward.

TABLE 23

FISCAL NEUTRALITY CRITERION: REGRESSION APPROACH FOR ILLINOIS HIGH SCHOOL DISTRICTS

	1972-73	1973-74	1974-75
District wealth	1.00000	1.00000	1.00000
District Revenue	0.82471	0.85144	0.86096
District Revenue and State Aid	0.44843	0.39949	0.34834
State Aid Effect on Equity	45.625%	53.081%	59.541%

The variation of wealth elasticity between 1972-73 and 1974-75 was near 0.10 (decrease about 23 percent). Such large variation between wealth elasticities clearly demonstrate the distributive power of state aid in the reform years. The state aid effect on the movement toward the goal for Illinois high schools was increased from 45.625 percent in 1972-73 to 59.541 percent in 1974-75.

Table 24 provides the data on wealth elasticities for Illinois unit school districts.

TABLE 24

FISCAL NEUTRALITY CRITERION: REGRESSION APPROACH FOR ILLINOIS UNIT SCHOOL DISTRICTS

	1972-73	1973-74	1974-75
District Wealth	1.00000	1.00000	1.00000
District Revenue	0.94341	0.89965	0.90780
District Revenue and State Aid	0.21693	0.17640	0.13478
State Aid Effect on Equity	77.006%	80.392%	85.153%

Similar to the results of wealth elasticities in district revenue functions for Illinois high school districts, the elasticities of district local revenue with respect to district wealth show heavy dependence of district revenue upon district wealth. However, they are decreasing somewhat with the passage of time. With regard to state aid effect, the distributive power of state aid was greater in the reform years than in the year before the reform. The distributive power was 77 percent in 1972-73, and 85 percent in 1974-75. The increasing state aid distributive power indicates the improvement of equity in financing Illinois unit school districts.

The Results for Michigan. Wealth elasticities in district revenue log-regression functions for Michigan school districts presented in Table 25 were as large as wealth elasticities in the district revenue function for Illinois elementary school districts. The elasticities of district revenue plus state aid in Michigan were declining from 0.22613 in 1972-73 to 0.13532 in 1974-75. With the distribution of the grandfather clause allocation, the further reduction of wealth elasticities resulted during the first year of the reform, but not during the second year. The decreasing wealth elasticities were due to the distribution of state aid plus the grandfather clause allocation. This trend demonstrates a marked improvement of the Michigan financing system with respect to reaching the goal of fiscal neutrality.

The Results for Kansas. In Table 26 wealth elasticities for Kansas school districts under 400 pupils are presented. The increasing wealth elasticities in district revenue functions was found in the table. In spite of the noticeable change of wealth elasticities in district local revenue in a negative direction, the state aid distribution in the reform

TABLE 25

FISCAL NEUTRALITY CRITERION: REGRESSION APPROACH FOR MICHIGAN SCHOOL DISTRICTS

	1972-73	1973-74	1974-75
District Wealth	1.00000	1.00000	1.00000
District Revenue	0.90447	0.87829	0.85880
District Revenue and State Aid	0.22613	0.13995	0.13532
District Revenue and State Aid and Grandfather Clause Allocation	Not Available	0.12951	0.13507
State Aid Effect on Equity	74.990%	84.065%	84.243%
Grandfather Clause Allocation Effect on Equity	Not Available	7.459%	0.184%

TABLE 26

FISCAL NEUTRALITY CRITERION: REGRESSION APPROACH FOR KANSAS SCHOOL DISTRICTS (UNDER 400 PUPILS)

	1972-73	1973-74	1974-75
District Wealth	1.00000	1.00000	1.00000
District Revenue	0.69873	1.01987	0.97208
District Revenue and State Aid	0.47008	0.42403	0.41440
State Aid Effect on Equity	32.723%	58.423%	55.768%

years reduced the wealth elasticities in district revenue by about 50 percent and also moved further toward the goal of fiscal neutrality.

The upward trend of wealth elasticities in the district local revenue function for Kansas school districts with between 400 and 1299

pupils are also shown in Table 27. The wealth elasticities in the district local revenue functions in 1973-74 and in 1974-75 exceeded the 1.00 which was indicated in the wealth elasticities for wealth itself. This exceeding of 1.00 may be due to the composition of district revenues or to the change of tax distribution. Further research about the distribution of tax rate and district revenue composition needs to be done. In Table 27 the state aid effect in reducing the heavy dependence upon local resources seems to be apparent. The effect was 36.937 percent in 1972-73 and increased to 70.994 percent in 1974-75.

TABLE 27

FISCAL NEUTRALITY CRITERION: REGRESSION APPROACH FOR KANSAS SCHOOL DISTRICTS (400-1299 PUPILS)

	1972-73	1973-74	1974-75
District Wealth	1.00000	1.00000	1.00000
District Revenue	0.69852	1.16367	1.08045
District Revenue and State Aid	0.44051	0.37415	0.31339
State Aid Effect on Equity	36.937%	67.847%	70.994%

In Table 28 a similar trend of wealth elasticity in the district revenue function for Kansas school districts of between 400 and 1299 pupils can be observed in district revenue functions for Kansas districts of over 1300. The state aid effect in achieving the goal of fiscal neutrality was pronounced. The wealth elasticities in the equations of district revenue plus state aid were reduced from 0.22731 in 1972-73 to 0.14012 in 1974-75. This large reduction of influence of district revenue on school revenue was apparently due to the greater distributive power of

state aid in the reform years.

TABLE 28

FISCAL NEUTRALITY CRITERION: REGRESSION APPROACH FOR KANSAS SCHOOL DISTRICTS (1300 AND MORE PUPILS)

	1972-73	1973-74	1974-75
District Wealth	1.00000	1.00000	1.00000
District Revenue	0.41713	0.79460	0.83367
District Revenue and State Aid	0.22731	0.18568	0.14012
State Aid Effect on Equity	45.506%	76.632%	83.192%

Summary

The major purpose of this study has been to investigate the degree to which school revenue equity improved after the adoption of new state aid funding systems in Illinois, Michigan, and Kansas. Equity was defined in terms of two criteria--permissible variance and fiscal neutrality. Permissible variance requires narrowing the variations of school revenue per pupil among school districts to some "permissible" amount, while fiscal neutrality calls for less dependence of school revenue upon district wealth. Two statistical methods were applied to the data under each criteria. The coefficient of variation and the McLoone Index under the permissible variance criteria were used to measure the variance of the entire school revenue distribution and of the school revenue distribution below the median. Under the criteria of fiscal neutrality, the Gini index and regression analysis were used. The Gini index regards the nature of school revenue distribution with respect to district wealth. The lower the Gini index, the less the dependence of

school revenue upon district wealth. In the regression analysis, wealth elasticity was generated from revenue functions with logarithmic transformations. The value of wealth elasticity indicated that the percentage of change in school revenue was due to a one percent change in district wealth. The statistical results from each method under each criteria for Illinois, Michigan, and Kansas presented in the foregoing section are summarized as follows.

1. District wealth disparities measured by both the coefficient of variation and Gini index in Illinois elementary school districts were relatively high when compared with the disparities in Illinois high school districts and unit school districts. The disparities of district wealth in Michigan school districts were as large as the disparities of district wealth in Illinois elementary school districts. However, a slightly decreasing trend of district wealth disparities was apparent in Michigan school districts, but not apparent in Illinois elementary school districts. For Kansas school districts, district wealth disparities in all enrollment categories of school districts were moderately high. There also appeared no clear reduction of district wealth disparities.

2. As part of the results of relatively high levels of district wealth disparities in Illinois elementary school districts and Michigan school districts, the disparities of district local revenues were also at high levels. For the Kansas school districts, district local revenue disparities became even greater in 1973-74 and 1974-75 reform years than in the year 1972-73 which was before the reform.

3. In spite of high levels of district local revenue disparities in school districts in all three states, a substantial reduction in the amount of school revenue disparities existed. The reduction of school

revenue disparities seems to be due to the great distributive effect of state aid.

4. Downward trends of school revenue disparities were observed in all three states. The downward movement over the school years included in the investigation showed clearly the distributional impact of the 1973 school financing reforms in the states of Illinois, Michigan, and Kansas.

5. With regard to fiscal neutrality, the downward movement of Gini indexes for school revenues with respect to district wealth were revealed in all three states, and indicated that there appeared a significant improvement of state funding systems toward the goal of fiscal neutrality.

6. In addition to the measurement of fiscal neutrality by Gini index, regression analyses were employed. Wealth elasticities in district revenue functions were found to be relatively high in Illinois and Michigan school districts, but only moderately high in Kansas school districts. Regardless of the high level of dependence of district revenue upon district wealth, wealth elasticities in district revenue plus state aid functions were substantially reduced. Moreover, the downward movement of wealth elasticities were evident in all three states. There seemed to have been marked improvement in reducing the degree of dependence of school revenue upon district wealth to a substantial extent. This moved Illinois, Michigan, and Kansas toward the goal of fiscal neutrality.

General Conclusion and Major Limitations

The evidence presented in this study suggests that the adoption of the grant-in-aid system known widely as "district power equalization" in the three states of Illinois, Michigan, and Kansas in the summer of

1973 did serve to move those states toward various equity goals including the goal of fiscal neutrality, at least as those goals are operationally defined in this study. There are several limitations on this major conclusion. First, there is some evidence that very poor districts in Illinois and Michigan may not have moved as fast toward the state median expenditure as most advocates of equity criteria would have wished. Second, the evidence presented here is for only two years after the reform in all three states. It cannot be said with certainty that the longer term effects of district power equalization are as beneficial as the short term effects appear to be or that they would be greater. Third, district power equalization grants-in-aid vary greatly from state to state as the information in Chapter III clearly shows. It cannot be said with certainty that all forms of grants-in-aid fitting under the general category of "district power equalization" would have the same effects as those investigated here. Fourth, the evaluation here is in terms of the total effects of these grant-in-aid reforms. It cannot be said with certainty which parts of these complex laws produced the effects noted here. Finally, the evidence presented here relates solely to the state general purpose grant-in-aid and no evidence is presented dealing with the effects of state categoricals or federal expenditures. However, with these five limitations born clearly in mind, this study should offer some degree of comfort to state legislatures that have either (a) recently adopted district power equalization systems, or (b) are not actively considering the adoption of such grant-in-aid systems.

Recommendation for Further Research

The following recommendations for additional research are suggested:

1. The examination of the effect of changing tax rate distribution

on the distribution of school revenue for operating purposes in district power equalization states. As indicated in Chapter I, the distribution power equalization system has as its unique nature "reward for effort." Under this system, the major concern is how "perfect" fiscal neutrality can be achieved. Thus, future research could determine if the district power equalization system has more positive effect in stimulating moderately rich school districts to raise their tax rates than it has in stimulating the poorer school districts to raise their tax rates. If this effect is determined to be operating, then the disparity of school revenue would be shifted upward and thus move the state away from the fiscal neutrality. To move the state toward fiscal neutrality, wealthy districts should get a lower percentage of matching state revenues for local tax rate increases than do poor school districts. Thus, it is extremely important from a policy-orientation standpoint to determine the effect of district power equalization formulas on changing local tax rates.

2. The comparing and contrasting of the characteristics of school districts that passed tax referendums and of school districts which failed to pass tax referendums in financing public schools. Districts with high effort in passing tax referendums may be those having high property wealth, high income, and high levels of education. Districts which failed to pass tax referendums may be those having low property wealth, low income, low educational level and located in rural areas. If so, it suggests that the socioeconomic variables might serve an important function in determining whether or not other districts can pass their tax referendums. Thus, the optional local taxation may not serve the purpose of achieving the goal of fiscal neutrality because wealthier school districts with a higher proportions of highly educated people, for example, may tend to provide more

educational resources for their children than do poorer school districts with a lower proportion of highly educated people. Thus, determining if optional local taxation helps move the state school districts toward the goal of fiscal neutrality is of prime importance. If the optional taxation feature is counterproductive toward achieving fiscal neutrality, it should be constrained.

3. The examination of the effect of school revenue control on the distribution of school revenue in relation to district wealth. A number of states, such as Kansas, Colorado, Maine, and Wisconsin recently have specified the maximum limit of budget expansion. If districts with high property assessed valuations increase their budget more frequently and closer to the limit than do the districts with low assessed property valuation, the disparity of school revenue among rich and poor school districts tends to increase with the passage of time. In order to remedy this situation, the different budget limit may need to be specified inversely in relation to the district wealth. Thus, the relationship of district wealth to budget expansion needs further study.

BIBLIOGRAPHY

BIBLIOGRAPHY

Books

Benson, Charles S. The Economics of Public Education. Boston: Houghton Mifflin Company, 1968.

Benson, Charles S.; Goldfiger, Paul M.; Hoachlander, Gareth E.; and Pers, Jessica S. Planning for Education Reform: Financial and Social Alternatives. New York: Dodd, Mead and Company, 1974.

Cohn, Elchanan. Economics of State Aid to Education. Massachusetts: D. C. Heath and Company, 1974.

Commission on Alternative Designs for Funding Education. Financing the Public Schools: A Search for Equity. Bloomington, Indiana: Phi Delta Kappa, 1973.

Grubb, Norton W. New Programs of State School Aid. Berkeley: University of California Childhood and Government Project, 1974.

Hickrod, Alan G. and Sabulo, Cesar M. Increasing Social and Economic Inequalities Among Suburban Schools. Danville, Ill.: Interstate Printers and Publishers, 1969.

James, Thomas H., Thomas, Alan J., and Dyck, Harold J. Wealth, Expenditures and Decision-Making for Education. Stanford, California: School of Education, Stanford University, 1963.

Johns, Roe L. "The Development of State Support for the Public Schools." Status and Impact of Education Finance Programs, ed. by Hohns, Floridal; Roe L.; Kern, Alexander; and Stollar, Dewey H. Gainesville, Florida: National Educational Finance Project, 1971.

Johns, T. L. Public School Finance Programs. Washington, D.C.: U.S. Government Printing Office, 1969.

Miner, J. Social and Economic Factors in Spending for Public Instruction. New York: Syracuse University Press, 1963.

Sacks, Seymour and Hellmuth, William F., Jr. Financing Government in a Metropolitan Area. New York: The Free Press of Glencoe, 1961.

Articles and Periodicals

Bishop, George A. "Stimulative vs. Substitutive Effect of State Aid to Education." Journal of Political Economy, Vol. LXVII, No. 6 (December 1959), 170-174.

Browing, Stephen R. "School Finance Litigation in a Post-Rodriguez Era." Planning and Changing 5 (Summer 1974):67-79.

Feldstein, Martin S. "Wealth Neutrality and Local Choice in Public Education." The American Economic Review (March 1975):75-89.

Fitzwater, C. O. "Impact of the Serrano Decision." The Courts Seek Fiscal Neutrality in Education, ed. by Gene D. Watson, Planning and Changing (Normal, Illinois), 1972.

Garms, Walter I. "Financial Characteristics and Problems of Large City School Districts." Educational Administration Quarterly (Winter 1967):14-27.

Grubb, Norton W. "The First Round of Legislative Reforms in the Post-Serrano World." Law and Contemporary Problems 38 (Winter-Spring 1974):459-492.

Hickrod, Alan G., et al. Definition, Measurement, and Application of the Concept of Equalization in School Finance, 1972, Illinois Office of Education, Springfield, Illinois (available as document ED 078 551 in the Eric systems).

Hickrod, Alan G. "Review of Four New Books in K-12 Finance." Journal of Educational Finance (Summer 1975):141-157.

Hirsch, Werner Z. "Determinants of Public education Expenditures." National Tax Journal 13 (1960)1:29-36.

Johns, Thomas L. "School Finance Reform in 1973--An Overview." Planning and Changing 5 (Spring 1974):42-50.

Michelson, Stephan. "What is a 'Just' System for Financing Schools? An Evaluation of Alternative Reforms." Law and Contemporary Problems 38 (Winter-Spring 1974):436-458.

Renshaw, Edward F. "A Note on the Expenditure Effect of State Aid to Education." Journal of Political Economy 67 (December 1959)6: 170-174.

Rossmiller, Richard A. "The Equalization Objective in State Support Programs: An Analysis of Measures Need and Ability." National Tax Journal 18 4:362-369.

Soltow, Lee. "The Distribution of Income Related to Changes in the Distribution of Education, Age, and Occupation." The Review of Economics and Statistics 42 (November 1960):450-53.

Unpublished Materials

Ewin, Laurrence. "Property Tax Determinants of Educational Expenditures." Unpublished Ph.D. Dissertation, Stanford University, 1969.

Firestine, Robert T. "Some Empirical Approaches to Comparing Equity in School Finance Systems: A Few Observations on Hickrod's 'Bivariate' Lorenz Curves." A paper presented at the Annual Meeting of the American Educational Research Association in Washington, D.C., 1975.

Garms, Walter I. "Use of the Lorenz Curve and Gini Index in School Finance Research." A paper presented at the 1975 Annual Meeting of the American Educational Research Association in Washington, D. C., 1975.

Gensemer, Bruce L. "Equalizing Educational Opportunity: Analysis of Proposal Reforms in Ohio State Aid to Public Schools." A paper presented at the 1975 Annual Meeting of the Ohio Association of Economists and Political Scientists in Columbus, Ohio, 1975.

Hickrod, Alan G. "Further Exploration in Human Resource Migration Among School Districts in Metropolitan Areas and the Effect of This Migration Upon School Finance: Final Report." Washington, D.C.: USOE, DHEW, Bureau of Research, September 1969.

Hickrod, Alan; Yang, Thomas Wei-Chi; Hubbard, Ben C.; Chaudhari, Ramesh. "Measurable Objectives for School Finance Reform: A Further Evaluation of the Illinois School Finance Reforms of 1973." Paper presented to the 1975 Annual Meeting of the American Educational Research Association, Washington, D.C., April 1975.

Kay, H. R., Jr. "The Study of the Relationship Between Selected Socio-Economic Variables and Local Tax Effort to Support Public Schools in Kentucky." Unpublished Ph.D. Dissertation, University of Florida, 1973.

Government Publications

Bureau of the Budget. State, Local, and Federal Financing for Illinois Public Schools: 1972-73. Springfield, Ill.: The Office of the Superintendent of Public Instruction of the State of Illinois.

Legislative Research Department. Results of 1973 School District Equalization Act--Local Effort Rates, State Aid Ratios, and Adjusted General Fund Tax Rates. Topeka, Kansas: Legislative Research Department, 1974.

The Senate Committee on Education. New Equity in Michigan School Finance: The Story of the Bursley Act. Lansing, Michigan: The Senate Committee on Education, 1973.

State, Local and Federal Finance for Illinois Public Schools in 1974-75. Springfield, Illinois: The Office of the Superintendent of Public Instruction, 1975.

Court Cases

Caldwell v. Kansas, No. 50616, P.C. Johnson Co. (1972).

Hollins v. Shofstall, No. C-253652, Maricopa Co., Ariz. (1972).

Milliken v. Green, 203 N. W. 2d 457 (1972).

Robinson v. Cahill, 62, N.J., 473, 303 A. 2d 273 (1973).

San Antonio Independent School District v. Rodriguez, U.S. Super. ct., No. 71-1332 (1973).

Serrano v. Priest, No. 938, 254, S. Ct. Cal. (1971).

Sweetwater County Planning Comm., v. Hinkle, 491 P. 2d 1234, Wyoming (1971).

Van Dusartz v. Hartfield, 334 F. supp. 870 (1971).