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ABSTRACT

This volume contains three papers that evaluate student equality resulting from school financing programs. The papers are based on the premise that student equity can be measured by comparing how much school districts spend. In the first paper the author presents a systematic analysis of several measures of equity and the implication of using each measure. In the second paper, the authors evaluate each state's accomplishment in equalizing student expenditures between 1970 and 1975. The data for the 1970 analysis were derived from 5,100 school districts and for 1975 from 6,100 districts. The authors conclude that overall national expenditure disparities have not decreased and may have, in fact, increased. The final paper is an evaluation of the 1973 Wisconsin school finance reform law. The detailed paper provides insights on how a sweeping reform package can be virtually nullified because of inconsistencies inherent in the legislation. (Author/JM)

Selected Papers in School Finance 1978

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
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PREFACE

This edition of Selected Papers in School Finance contains papers which largely focus on the evaluation of equity to pupils in the financing of public schools. These studies are based on the premise that pupil equity can measured by school district dollar outlays. While the authors recognize the limitations of this assumption, they have all assumed that per pupil expenditures are a proxy for pupil equity. In the first paper, "Alternative Equity and Equality Measures: Does the Measure Make A Difference?" the author presents a systematic analysis of various measures of equity and of the implication of using each measure. An earlier version of this analysis was published as a working paper by New York University, Graduate School of Public Administration.

In the second paper, "School Finance Reform in the Seventies: Achievements and Failures," the authors have evaluated each State's performance in moving towards equity in equalizing pupil expenditures between 1970 and 1975. The data for this analysis for 1970 were derived from the ELSEGIS sample of 5,100 school districts which accounted for approximately 75 percent of pupil enrollment. For 1975, the ELSEGIS sample contained 6,100 school districts and comprised about 80 percent of pupils enrolled. Both samples included districts enrolling less than 300 pupils. The samples were representative for each State and included all of the populous school districts in the country. While the evaluation of State performance on equity measures such as expenditure ranges and coefficients of variation is limited by any sample, it is unlikely that the results reported in this paper would change substantively if data

for the universe had been used. Results for the universe markedly at variance with those reported in the study would require that most of the excluded districts be substantially different from the large sample data base. The authors view this assumption as unwarranted. Moreover, available independent studies conducted in individual States, such as those for Ohio and New Jersey and the one for Wisconsin, which is reported here, largely corroborate the findings of this report. This paper revises the Interim Report first published in Part 13 of the Congressional Hearings on H.R. 1138, September 1977.

The final paper, "Impact of the 1973 Wisconsin School Finance Reform," is the first major evaluation of the reform law enacted in that State. The study is unusual in some important respects. To demonstrate the effects fo this law, the authors have relied on cross-tabulation rather than regression analysis. In addition, the analysis of school finance is placed in the context of the State/local fiscal setting, rather than treated in isolation. The study is rich in detail and provides important insights on how a sweeping reform package can be virtually nullified because of inconsistencies inherent in the legislation.

Esther O. Tron
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CONTENTS

ALTERNATIVE EQUITY AND EQUALITY MEASURES: DOES THE MEASURE MAKE A DIFFERENCE?*

This paper[1] deals with the issue of equity and public education, an issue that has received a great deal of attention during the last decade. The Serrano vs. Priest decision by the California Supreme Court can be viewed both as a result of this attention before 1971 and a cause of increased examination since.[2] One outcome of the thinking, discussion, and research on equity has been the requirement that we articulate what we mean by equity and it is apparent we do not all mean the same thing. Concepts such as equality, disparity, variation, and fiscal neutrality have been used in conjunction with expenditures, property tax yields, resources, etc.

The purpose of this paper is to sort out some of the alternative conceptions of equity and compare alternative ways of measuring equity in the area of public education.[3] Since a primary goal of the school finance reform movement has been to increase the equity of the public education system, school finance reform has had a considerable impact on the way in which the consideration of educational equity has developed.

This paper proceeds by examining a number of separate but related questions that need to be addressed if we are to measure equity. We will argue that the measurement of equity forces us to pass judgment on a distribution of resources and there can be legitimate differences in the way in which the judgments are made and resources defined and measured. The discussion is divided into five sections. The first section briefly defines equity in a way that forces consideration of what it is we desire to be equitable, in other words the

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argument of the equity criteria or function.[4] A set of alternative arguments are considered in the second section and questions of measurement are raised and attended to in the third section. The fourth section presents a brief comparison of several of the measures discussed in section three using data from school finance studies. The fifth and final section discusses some of the implications of equity measurement for policy analysis. Educational policy analysts will continually have to provide inputs to those who must assess whether one situation is more equitable than another.

One further introductory point is in order. Equity analysis cannot be carried out without making value judgments and this should compel those who consider equity to be as explicit as possible regarding the value judgments that are built into the analysis. Thus, the exposition of value judgments is a goal of this paper.

1. Definition of Equity

Equity, obviously, cannot be defined once and for all, as such an undertaking has occupied entire lifetimes, not several pages. However, it is hoped that the working definition below will provide an acceptable and useful framework for analysis.

The general definition of equity used in this paper rests on the idea that an equitable situation is one in which equals are treated equally. Furthermore, an equitable situation is one in which unequals are treated unequally.[5] At this point it is important to point out where our value judgments enter. If we can measure by "treatment" and if the population for which we are assessing equity consists of equals, then the equal treatment of equals would be the only relevant definition of equity. Value judgments would be required to determine how we measure the degree of inequality among equals and in this case the measurement

of equity is the measurement of equality. Some of these value judgments encountered in measuring equality are considered in Section III, below. If our population consists of unequals, then value judgments are required first to determine how the inequality of the population is determined, that is, the appropriate criteria for inequality. A second set of value judgments is needed to decide how unequally unequals are to be treated and a third value judgment is needed to measure inequality in the final treatment of the unequals. Note that the third value judgment in this case is analogous to the only value judgment necessary for a group of equals.

Two other points should be raised in conjunction with this definition of equity. First, the definition did not specify on what group the analysis should focus. Is it the individual, family, taxpayer, etc.? For the analysis of equity and education that follows the point of view utilized is that of the student. Other points of view such as the taxpayer or citizen will be examined to some degree through the course of the analysis but the issue of student equity will be considered paramount. Despite tax effects or the "publicness" of education the student seems to be the one most affected by the educational system.[6]

It should be noted that, when examining interdistrict equity, the student approach used here is not the same as a district approach since district size as measured by the number of students usually varies considerably. The student approach weights each district by the number of students in the district compared to the district approach that treats districts equally. Although this paper utilizes the student approach almost all of the issues raised and measures suggested are appropriate if the district is the unit of analysis. The selection of the student approach is a value judgment and the remainder of the paper can be read from either the student or district viewpoint.

Second, the analysis and discussion in this paper assume that it is appropriate to examine educational equity in isolation. However, Levin has used a "capital embodiment" approach to suggest that the formal schooling process must be considered in conjunction with other activities that affect the student population such as "medical services, dental services, nutritional inputs, inputs from shelter, and family interactions and experiences."[7] The framework that Levin sets out is viewed to be valid but a partial view is taken here primarily as a starting point for the measurement of equity and public outputs for the student population. To discuss equity in Levin's context would require consideration of each of the capital embodiment activities jointly and this paper can be viewed as a first step towards that goal.

The working definition of equity--equal treatment for equals and unequal treatment for unequals--is itself a value judgment and the acceptance of this definition forces us to make a number of other value judgments. If we are concerned with the application of this definition for education from the student perspective, the notion of "treatment" in the educational sector must be elaborated further.

II. The Education Process--What to Measure?

Although we now have a working definition of equity we are still quite far from applying it to education since the issue of the measurement of education has not been resolved. Education consists of expenditures, teachers, classrooms, performances, etc. Which of these is the appropriate argument of an equity function? In this section the advantages and disadvantages of a number of alternatives are considered.

The public education system can be represented by a number of components or characteristics including a political process for budget setting, budgeted and actual revenues, the conversion of revenues to resources, the combination of

resources to produce outputs, and the benefits that are derived from the outputs.[8] Theoretically, any or all of these components could be used to measure the equity of the educational system from the student point of view. We could measure the degree of inequity in the political process, school revenues, resource inputs, school outputs or social benefits and an obvious question at this point is which component, if any, is the most desirable as the argument of an equity criteria.

While it may be argued that the proper equity argument is the distribution of individual and societal benefits that are produced by the educational system, there are at least two reasons why this may not be appropriate.[9] First, the social and individual benefits from education may be difficult to measure with an acceptable degree of accuracy. Second, in many cases we are interested in determining the impact of a finance policy on the educational system and while it may be difficult to trace the impact of the policy on school budgets or resources,[10] it is almost impossible to trace the effect of the finance policy on benefits.

Even though within the bounds of current research we cannot use educational benefits as the argument of the equity function, we do not necessarily have to use the dollars that flow into the school district. For the remainder of this section we will consider the use of three specific arguments of the equity function; dollars, dollars adjusted for price differences, and resources. These three measures will be discussed in the context of equity measurement in general and for situations where the impact of school finance reform on equity is sought.

The measure of the educational system that is most commonly used as an argument of an equity function is the component related to school budgets. This is normally represented by revenues or expenditures, usually on a per student basis. Thus, to measure the equity of a number of distributions we would compare the inequity of per pupil revenues or expenditures across districts or students.

If we are concerned with the impact of school finance reform on equity we can measure the inequity of the distributions before and after the reform. Here, however, we may have a control problem; other parts of the educational system may have caused some of the observed changes. [11] However, we may be able to isolate the major causes of change other than the finance reform. More severe difficulties arise if we attempt to predict the effect of the reform before it occurs. The reform does not only affect state aid but also affects locally raised revenues so that the ex ante calculation of the impact of the reform is somewhat complex.[12] Nevertheless, existing data and methodology suggest that revenues or expenditures on a per pupil basis are a viable argument for the equity function.

One difficulty with the school budget measures, however, is that school budgets purchase different amounts of educational inputs (teachers, textbooks, etc.) in different areas due to price variations. As a result, expenditures or revenues from different districts may not be comparable. One way to overcome this difficulty is to adjust the school budgets according to the different input prices that each district faces but, although this sounds straightforward, there is not unanimity among researchers regarding an appropriate price adjustment. Actual price differences reflect demand and supply factors and, in theory, only supply factors should enter a price adjustment index but the supply and demand factors are difficult to disentangle. Furthermore, prices should be compared for inputs of similar quality and a valid quality measure for inputs such as teachers is not currently available.

The recent research on price indexes indicates, however, that there are two categories of adjustments that can be used in an attempt to translate dollars to equal buying power.[13] One technique is to estimate a price index for each location based on a local "basket of goods". Kenny et al. discuss this practice

for Florida where it is used to adjust the state aid formula.[14] There are technical problems encountered in the computation of such an index and it is questionable whether it is the appropriate index for educational inputs. The second approach is to adjust the salaries or costs according to factors which influence the supply of inputs as determined through econometric analysis. The primary problem here is the identification of the relevant factors and the adequate measurement of controls, although recent research has made some progress. Note that if the assumption is made or empirical research shows that prices across districts are comparable, the measures of expenditures and price adjusted expenditures are identical.

At this stage we cannot measure which category of adjustment is correct except that we do know that they yield different indices. Kenny et al. compare the Florida "basket of goods" index, Brazer's indices applied to Florida, and their own, and found "noticable" differences among them.[15] Grubb and Hyman display the correlations among different indices based on a range of supply-demand assumptions and find that "alternative assumptions can yield substantially dissimilar indices."[16]

The conclusion to be drawn here is that if we adjust dollars to reflect differences in resource prices we may be more accurately measuring resources but the range of alternative adjustments appears to be wide, given the current state of the art and available data. Note that the conclusions regarding the use of a price adjustment are not influenced by whether we are measuring equity in general or the effect of school finance reform on equity.

The third possible argument of the equity function that will be considered is the direct measurement of educational resource inputs such as teachers, textbooks, supplies, etc. There are at least two problems that must be overcome in order to measure the inequity of a number of distributions using resource inputs as the argument of the equity function.

First, it is very difficult to assess the differences in quality for a type of resource input such as teachers. This measurement problem makes the task of converting the resource inputs of a given type to a common measure rather complex. In order to measure resource inputs we should find a way to take quality differences into account. For exmaple, all teachers are not alike and a simple teacher count could possibly be misleading. The second problem is the conversion of different types of resource inputs such as teachers, administrators, supplies, etc. to a common measure in order to obtain a per pupil measure of resources for a school district. Since human inputs form such a large percentage of educational resource inputs, we may be content to only measure these but even here we must find a common denominator for teachers, teacher aides, administrators, etc. These are not trivial measurement problems.

There are a number of additional issues that should be raised if we intend to use resources to measure the effects of school finance reform. First, the control problem discussed for the previous arguments seems to be somewhat more severe. That is, the resource changes after a school finance reform may not be entirely attributable to the reform. Furthermore, prior to the reform, it would be more difficult to predict the effect of the reform on the resources compared to revenues or expenditures. Finally, resources are not labelled according to their funding sources so that state versus local resources cannot be separated as they can be for revenues.

The difficulties cited for resource type measures do not eliminate them from consideration as an argument for an equity criteria. Pugh et al. have used resource type measures to compare the interdistrict distribution of resources across states.[17] Pugh et al. present a measure of resources in which they count (for each district) the number of instructional staff members at each degree level and then multiply the number in each category by the average

salary nationally for that degree level. This represents the instructional resource component converted to dollars, and non instructional expenditures are added to the instructional resource dollars to produce the measure "current expenditures with salaries controlled by degree level." The assumptions in this measure should be noted. First, quality difference across degree levels are assumed to be accurately measured by national salary differentials and quality differences across districts for comparable degree levels are ignored. Second, other resources are assumed to be equal to dollars.[18]

There are several conclusions that can be drawn concerning the use of "resource" type measures of the educational system as an argument for an equity criteria. First, Pugh et al. have demonstrated that a procedure that measures the variation in resources can be developed from currently available data. However, as a result of the measurement problems a number of assumptions must be built into the procedures and the validity of these assumptions is presently untested. This point is particularly important since Pugh et al. indicate the variation in "resources" is not the same as the variation in revenues.[19] Finally, the use of resource type arguments appears to be more questionable than the dollars or price adjusted dollar measures when the purpose of the analysis is to measure the effects of school finance reform.

Three arguments of equity functions have been considered in detail in this section. Dollars (i.e., revenues and/or expenditures), dollars adjusted for price variation, and resources were discussed as arguments for equity functions for the measurement of interdistrict equity or the measurement of the effects of school finance reform. Each argument is feasible and each has advantages and disadvantages. Furthermore, we have reasons to believe that the conclusions for equity analysis that would be drawn using different arguments could vary considerably. Unfortunately, at this point it does not seem possible to eliminate any of the three.

Finally, it should be pointed out that there is a type of argument for the equity function that was not treated in this section. Since the equity measures that will be discussed in the next section can be applied to any numerical distribution, it is worth pointing out that under certain circumstances we may want to measure the inequity (or inequality) in education outputs. For example, outputs such as achievement test scores, reading and writing performances on consumer problems, functional literacy rates, or educational attainment measured in years of education or degrees, all of which are tabulated yearly in The Condition of Education[20] could be used as the argument of an equity criteria although it might be questionable to do so in the context of school finance reform.

Thus far we have considered the arguments of an equity function or, in other words, "What to Measure". The next section considers "How to Measure" equity.

III. Equity of the Education Process--How to Measure?[21]

The working definition of equity that was outlined in Section I contained two parts. Equity was defined as the equal treatment of equals and if all individuals are considered equal, then measures of equity becomes measures of equality. A perfectly equal distribution is one in which each member of the population receives an identical amount of the argument of the criteria. However, if people are not considered equal, then the appropriate unequal treatment of unequals must be included in the measure of equity. These two cases provide a way of sorting out some of the issues confronting the measurement of equity. First, the case where all individuals are defined as equals will be examined and, for this case where equality implies equity we shall discuss equality measures.[22] Second, a number of rationales can be presented for the unequal treatment of unequals and the measurement issues raised for these cases which lead to equity

measures will be treated after the measures of equality have been discussed.

Before the questions of measurement are confronted, two preliminary points need to be made. First, certain assumptions will be made about the nature of data that are available for use. It is assumed that the available data are at the district level in per pupil units. For the most part we also assume that the student is the relevant unit of analysis although the measures are shown to be equally applicable when the district is the unit of analysis.[23] These assumptions will allow us to compare the equity of different sets of school districts. Note that when the groups of districts correspond to states the analysis can be viewed as a comparison of equity or equality among states or an analysis of equity or equality in one state over time. The second preliminary point is that the measures that are developed in this section are applicable to all of the possible arguments of an equity function discussed in the last section. The only condition is the argument must be measured in a continuous numerical scale. Note that the three arguments most appropriate for an analysis of school finance reform; dollars, dollars adjusted for price differences, and resources, meet this criterion as do other arguments such as achievement scores, years of education, literacy rates, etc. The measures developed here are, therefore, general measures and while the examples may use one argument (usually dollars) this is done only for illustrative purposes, not to answer the question "What to Measure."

A. Measures of Equality

A measure of inequality summarizes a distribution into one single measure. There are a number of ways to accomplish this but each measure has certain value judgments or assumptions built into the measurement process. In this part we will first discuss a number of value judgments or assumptions that are built into inequality measures and then we will assess specific measures in

relation to these value judgments. As is the case for value judgments in general, the ones discussed here may cause reasonable people to disagree over the "correct" value.

The value judgments examined here will be formulated in terms of questions and these are displayed in Table 1. The questions in Table 1 are posed assuming that dollars per pupil is the argument of the equity function. The term "unit" in Table 1 refers to the unit of analysis which is usually the student or the district in investigations of educational equality. But note that the questions are relevant for all units and arguments.

The first question asks whether all units are included in the measure. Certain measures focus only on units at particular points in the distribution while other measures use all units to compute the equality measure.

A second set of value judgments is represented by questions two through five. Some people may believe that an equality measure should show an improvement if resources are transferred from a unit higher in the distribution to one lower in the distribution and, therefore, affirmative answers to these questions would be desirable. Each measure we will consider is sensitive to certain kinds of transfers, but not others, and these four questions are posed to distinguish among different kinds of transfers. Note that the transfers described here do not change the mean of the distribution.

A third set of value judgments is concerned with the over all level of the distribution as represented by the mean of the distribution. The distributions that will be compared will usually have different mean values for the argument of the equality measure and the measures we will consider incorporate the mean level differently. Questions six and seven illustrate two ways in which the mean level can be taken into account.

The nature of this value judgment can be illustrated more precisely with

TABLE 1

A LISTING OF VALUE JUDGMENTS

1. Are all units* (students, districts, etc.) taken into account in the equality measure?

2. Does the equality measure always show an improvement when dollars** are transferred from one unit to another that is lower in the distribution and both units are located on the same side of the mean?

3. Does the equality measure always show an improvement when dollars are transferred from one unit to another that is lower in the distribution and both units are located on the same side of the median?

4. Does the equality measure always show an improvement when dollars are transferred from one unit above the mean to another that is below the mean?

5. Does the equality measure always show an improvement when dollars are transferred from one unit above the median to another that is below the median?

6. Does the equality measure always show an improvement when a constant amount of dollars is added to each unit?

7. Does the equality measure always show increased inequality when the total dollars of each unit are increased by a proportional amount?

8. Does the equality measure record dollar changes at different levels of the distribution in the same way?

9. Is the mean level used as a basis of comparison?

10. Is the median level used as a basis of comparison?

11. Are all levels compared to one another as the basis of comparison?

*The term "unit" refers to the unit of observation. In most investigations of educational equality the unit is the school district. Districts may or may not be weighted on a student basis.

**It is assumed here that dollars (per pupil) is the argument of the equity function. The same questions could be asked with other arguments.

an example. Table 2 shows three sets of distributions where each set consists of five districts each with one pupil. Set II is derived from Set I by adding $450 to each district's per pupil expenditures and Set III is derived from Set I by multiplying each district's per pupil exoenditures by a factor of 1.5. If the answer to question six is yes, then the equality measure will rank Set I less equal than Set II. If the answer to question seven is yes, then the equality measure will rank Set I more equal than Set III.

Later it will be shown that certain equality measures rank Set I less equal than Set II (answer to question six is Yes) and Set I equal to Set III (answer to question seven is No). We will call these measures "sensitive to equal additions" and "insensitive to equal percentage increases".[24] A second group of equality measures will rank Set I equal to Set II (answer to question six is No) and Set I more equal than Set III (answer to question seven is Yes) and we will call these measures "insensitive to equal additions" and "sensitive to equal percentage increases". Many would argue that equal additions should decrease inequality (question six should be answered Yes) and equal percentage increases should keep the level of inequality constant (question seven should be answered No). While these people prefer a measure of inequality that is insensitive to equal percentage increases, others disagree and, therefore, this appears to be a value judgment. These two value questions will be considered for each measure below.

Question eight deals with the weighting of movements toward or away from equality when the movements occur at different points in the distribution. More specifically, some of the measures incorporate the belief that changes for units at the low end of the distribution should somehow be taken into account to a greater degree than comparable changes at the high end of the distribution. Note that the answer to question eight is no when certain units are excluded

TABLE 2

SET OF DISTRICTS WITH DIFFERENT LEVELS OF EXPENDITURES PER PUPIL

	Set I	Set II*	Set III**
	Per pupil expenditures	Per pupil expenditures	Per pupil expenditures
District A	$ 700	$1,150	$1,050
District B	800	1,250	1,200
District C	900	1,350	1,350
District D	1,000	1,450	1,500
District E	1,100	1,550	1,650
Mean expenditure	$ 900	$1,350	$1,350

*Where each district in Set I receives an additional $450 per pupil.

**Where per pupil expenditures in Set I are increased by a factor of 1.5.

from the measure (i.e., when the answer to question one is no) so that question eight is significant when question one is answered affirmatively.

The final three questions, nine through eleven, are concerned with the standard of comparison used in the equality measure. The mean or median is used in most measures, although some compare among all units.

Before the array of measures is presented we should indicate two possible ways in which the measures can be used. Inequality measures can be used to rank distributions. That is, one distribution can be more equal (or unequal) than another. But, since equality measures are continuous, these measures can also be used to quantify the amount of inequality difference between two distributions. Sen discusses inequality measures and shows that each inequality measure corresponds to certain welfare functions or class of welfare functions. However, Sen also points out that the restrictions on the welfare functions are more severe if the amount rather than just the direction of the inequality is to be measured.[25]

Nine equality measures will be reviewed in this part including the range, restricted range, Federal range measure, relative mean deviation, permissible variance, variance, coefficient of variation, standard deviation of logarithms, and Gini coefficient. Each of these measures will be discussed in the context of the value judgments listed in Table 1. A summary of the answers to the value judgment questions appears in Table 3 for each of the nine equality measures.

In order to explain more fully how each of the measures incorporates the various assumptions and value judgments, a number of hypothetical sets of data will be used. The first sets of data, Distributions A, B, C, and D, are displayed in Table 4. Each distribution has 100 districts at various levels of per pupil expenditures and, for simplicity, each district is assumed to have one student. As a preliminary exercise the reader may wish to decide for him or herself, how Distributions A, B, C, and D would rank in terms of equality.

Distribution B is derived from Distribution A by taking dollars away from

TABLE 3

ANSWERS TO VALUE JUDGMENT QUESTIONS
FOR NINE EQUALITY MEASURES

VALUE JUDGMENTS*	EQUALITY MEASURES								
	Range	Restricted Range	Federal Range Ratio	Relative Mean Deviation	Permissible Variance	Variance	Coefficient of Variation	Standard Deviation of Logarithms	Gini Coefficient
1. All units taken into account?	No	No	No	Yes	No	Yes	Yes	Yes	Yes
2. Improvement for transfers on one side of the mean?	No	No	No	No	No	Yes	Yes	Yes**	Yes
3. Improvement for transfers on one side of the median?	No	No	No	No	No	Yes	Yes	Yes**	Yes
4. Improvement for transfers that cross mean?	No	No	No	Yes	No	Yes	Yes	Yes	Yes
5. Improvement for transfers that cross median?	No	No	No	No	Yes	Yes	Yes	Yes	Yes
6. Sensitive to equal additions?	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes
7. Sensitive to equal percentage increase?	Yes	Yes	No	No	No	Yes	No	No	No
8. Changes at different levels recorded identically?	No	No	No	No	No	Yes	Yesa	No	No
9. Mean for comparison	No	No	No	Yes	No	Yes	Yes	Yes	No
10. Median for comparison?	No	No	No	No	Yes	No	No	No	No
11. All levels for comparison?	No	No	No	No	No	No	No	No	Yes

*For a more complete description of the value judgments, see Table 1 and text.

**At very high levels in the distribution, the answer may be no.

TABLE 4

NUMBER OF DISTRICTS AT EACH MEAN PER PUPIL EXPENDITURE LEVEL FOR DISTRIBUTIONS A, B, C, D.

Mean per Pupil Expenditures	Distribution of Districts Distribution A	B	C	Mean per Pupil Expenditures	Distribution D
$200	8	4	4	$240	4
500	12	8	16	600	8
900	14	10	18	1,080	10
1,000	12	20	12	1,200	20
1,200	18	22	14	1,440	22
1,600	12	12	12	1,920	12
2,400	9	11	9	2,880	11
3,000	7	5	7	3,600	5
4,000	3	5	3	4,800	5
6,000	3	2	3	7,200	2
7,200	2	1	2	8,640	1
	100	100	100		100
Mean expenditure per pupil (all districts)	$1,600	$1,600	$1,600		$1,920
Median expenditure per pupil (all districts)	$1,200	$1,200	$1,100		$1,440

Note: There are 100 districts in each distribution, Each district is assumed to have one student.

the higher expenditure districts and reallocating the dollars to the lower expenditure districts in the following manner:

i) $3200 is taken away from a district at the $7200 level;
ii) $2000 is taken away from a district at the $6000 level;
iii) $600 is taken away from two districts at the $3000 level;
iv) $800 is reallocated to four districts at the $200 level;
v) $500 is reallocated to four districts at the $500 level;
vi) $300 is reallocated to four districts at the $900 level

A total of $6400 was reallocated. Intuitively it seems that Distribution B is more equal than Distribution A since the mean of Distribution A is $1600 and thus these transfers are from the "rich" to the "poor".

Distribution C is derived from Distribution A by taking away $300 from four districts at the $1200 level and reallocating the dollars to four districts at the $200 level. Intuitively we may feel that Distribution C is more equal than Distribution A or, in other words, that transfers from the less poor to the poor should increase equality. Finally, Distribution D is derived from Distribution B by multiplying the per pupil expenditures in every district by a factor of 1.2.

In the conclusion to this part we will review the nine equality measures. Table 5 presents the value of each of the nine measures for the four hypothetical distributions and shows how each of the measures would rank the four distributions in terms of equality.

1. Range

The range is defined as the difference between the highest and the lowest observations in the distributions. As shown in Table 3, the range is insensitive to a large number of different types of transfers since all but the highest and lowest observations are ignored. Notice, for example, from Table 5 that the range measures do not discriminate between Distribution A, B and C. Coupled with the insensitivity to a large number of transfers is the range's sensitivity to changes in the highest and lowest units in the distribution and these may

TABLE 5

COMPUTATION OF MEASURES OF EQUALITY AND RANKING OF DISTRIBUTIONS A, B, C, and D

Measure**	Computation: Distribution A	B	C	D	Computation: Distribution A	B	C	D
1. Range	$7000	$7000	$7000	$8400	1*	1	1	4
2. Restricted Range	$5800	$3500	$5500	$4200	4	1	3	2
3. Federal Range Ratio	29	7	11	7	4	1	3	1
4. Relative Mean Deviation	.6075	.5275	.6075	.5275	3	1	3	1
5. Permissible Variance	.6167	.7233	.6727	.7233	4	1	3	1
6. Variance	20.182×10^5	14.886×10^5	20.014×10^5	21.435×10^7	3	1	2	4
7. Coefficient of Variation	.8879	.7626	.8842	.7626	4	1	3	1
8. Standard Deviation of Logarithms	.8725	.7170	.8077	.7170	4	1	3	1
9. Gini Coefficient	.4155	.3557	.4098	.3557	4	1	3	1

*Note: Underlined ranking indicate ties.

**See text for explanation.

not be truly representative of the equality of the distribution. Finally, the range is insensitive to equal additions and sensitive to equal percentage increases.

2. Restricted Range

Due partly to the sensitivity of the range to extreme values, a restricted range measure has been developed where the restricted range is the difference between two specific points in the distribution usually defined in pecentiles. A common example, and the definition employed in Table 5, is the difference between the 5th and the 95th percentile of per pupil expenditures. A second popular restricted range is the interquartile range, the difference between the 25th and 75th percentiles. Although the restricted range is still insensitive to a large number of changes, the restricted range rankings can differ from those of the range as shown in Table 5. Note, for example that using the restricted range Distribution B is ranked more equal than A, and C more equal than A which may be in line with our intuitive judgments. However the insensitivity can cause a conflict with our intuition and we will see this below. Similarly to the range, the restricted range is insensitive to equal additions.

3. Federal Range Ratio

Recently, proposed Federal regulations have used an expenditure equality measure.[26] The Federal measure utilizes the restricted range defined by the difference between per pupil expenditures at the 5th and 95th percentile but this difference is expressed as a ratio and not as an absolute amount since this restricted range is divided by per pupil expenditures at the 5th percentile. We call this measure the Federal range ratio. In terms of the value judgments, the only significant change from the restricted range is that the Federal range

ratio is insensitive to equal percentage increases where the restricted range not. Note that the Federal range ratio also ranks Distribution B more equal than A and C more equal than A. But the restricted range, like the other range measures, is insensitive to a large number of movements towards equality and we will illustrate this below.

4. Relative Mean Deviation

A measure that includes all the units in the measure is the relative mean deviation. This measure of equality looks at the differences between each district's per pupil expenditures and the mean per pupil expenditure and expresses the absolute value of these differences as a percentage of total expenditures in the distribution. If we assume that there are P_i pupils in each district, then the formula for the relative mean deviation with the pupil as the unit of analysis is the following:

$$\sum_{i=1}^{N} P_i \left| u - X_i \right| \Big/ \sum_{i=1}^{N} P_i \; u,$$

where u is the mean per pupil expenditure, N is the number of districts, P_i is the number of pupils in district i, and X_i is the mean per pupil expenditure in district i.[37] As shown in Table 3, the relative mean deviation is sensitive to certain transfers that were not reflected in the range type measures. However, the relative mean deviation is not sensitive to all transfers; transfers that do not cross the mean are not reflected in this equality measure. As a result, Distribution C is not ranked more equal than Distribution A by the relative mean deviation. The relative mean deviation, like the Federal range ratio, is insensitive to equal percentage increases.

5. Permissible Variance

An equality measure that is related to the relative mean distribution is the permissible variance measure utilized by Hickrod et al.[28] This measure is

ased on the dollars needed to raise all districts spending below the median level of per pupil expenditure to the median level. The measure is constructed as a ratio: the numerator is the actual spending in the districts below the median level and the denominator is the spending that would occur if all districts below the median spent at the median level. The formula for the permissible variance may be stated as follows:

$$\frac{\sum_{i}^{J} P_i X_i}{M \sum_{i}^{J} P_i},$$

where J represents the districts below the median level of per pupil expenditures, X_i is the mean per pupil expenditure in the district i, P_i is the number of students in district i, and M is the median level of per pupil expenditures for the distribution.[29] Although according to Table 5 the permissible variance ranks Distribution B more equal than A, and C more equal than A, the permissible variance is only sensitive to transfers that cross the median. Transfers above the median are ignored and transfers that take place below the median are not recorded as an improvement in the measure and we will show an example of this below. The permissible variance is insensitive to equal percentage increases.

6. Variance

As the assessment in Table 3 shows, the variance is sensitive to all the transfers listed. The variance is the average of the squared deviations from the mean or, in formula form, using the pupil as the unit of analysis,

$$\sum_{i=1}^{N} P_i (u-X_i)^2 / \sum_{i=1}^{N} P_i,$$

where u is the mean per pupil expenditure, N is the number of districts, P_i is the number of pupils in district i and X_i is the mean per pupil expenditure in

district i.[30] The variance does rank Distributions B and C as being more equal to A but the variance is not insensitive to equal percentage increases. Thus, even though the variance appears to be more sensitive to a range of transfers, if insensitivity to equal percentage increases is desirable, the variance is not preferable.

Before we present the final three measures we will show some of the insensitiveness of the abovementioned measures with an example. Since Distributions A, B, C, and D did not illustrate these particular insensitivities we will introduce three new distributions. Distributions E, F, and G are displayed in Table 6. Each distribution has 25 districts at varying levels of per pupil expenditure and it is assumed that there is only one pupil per district. Distribution F is derived from E by transferring $50 from a district at the $600 per pupil expenditure level to one at the $200 level. Distribution G is derived from E by making a $50 transfer from a district at the $1800 level to one at the $1400 level. It should be noted that if transfers from a higher to a lower spending district should increase the equality of the distribution, the equality measures should rank F and G more equal than E.

The computation of the values for the nine equality measures for Distributations E, F, and G and the rankings of the distributions are displayed in Table 7. The insensitivity of the first five equality measures considered above is illustrated by the fact that these measures do not differentiate among Distributions E, F, and G. Therefore, if we believe that our equality measures should differentiate between these distributions we must reach for alternatives to the range, restricted range, Federal range ratio, relative mean deviation, and permissible variance. The variance is sensitive to the differences in these three distributions but is insensitive to equal percentage increases. The final three equality measures are insensitive to equal percentage increases and differentiate among Distributions E, F, and G.

TABLE 6

NUMBER OF DISTRICTS AT EACH MEAN PER PUPIL EXPENDITURE LEVEL FOR DISTRIBUTIONS E, F, AND G

Mean Expenditures per Pupil	Distribution of Districts		
Distribution	E	F	G
$200	5	4	5
250	-	1	-
550	-	1	-
600	5	4	5
1,000	5	5	5
1,400	5	5	4
1,450	-	-	1
1,750	-	-	1
1,800	5	5	4
	25	25	25
Mean expenditure per pupil (all districts)	$1,000	$1,000	$1,000
Mean expenditure per pupil (all districts)	$1,000	$1,000	$1,000

Note: There are 25 districts in each distribution. Each district is assumed to have one student.

TABLE 7

COMPUTATION OF MEASURES OF EQUALITY AND RANKING OF DISTRIBUTIONS E, F, AND G

Measures**	Computation: Distribution E	Computation: Distribution F	Computation: Distribution G	Ranking: Distribution E	Ranking: Distribution F	Ranking: Distribution G
1. Range	$1600	$1600	$1600	1*	1	1
2. Restricted Range	$1600	$1600	$1600	1	1	1
3. Federal Range Ratio	8.	8.	8.	1	1	1
4. Relative Mean Deviation	.48	.48	.48	1	1	1
5. Permissible Variance	.500	.500	.500	1	1	1
6. Variance	1.6×10^6	1.3426×10^6	1.3426×10^6	3	1	1
7. Coefficient of Variation	.5657	.5645	.5645	3	1	1
8. Standard Deviation of Logarithms	.81365	.80597	.81345	3	1	2
9. Gini Coefficient	.3200	.3198	.3198	3	1	1

*Note: Underlined rankings indicate ties.

**See text for explanation.

7. Coefficient of Variation

The coefficient of variation is computationally the square root of the variance divided by the mean (u) of the distribution. The coefficient of variation is sensitive to the transfers listed in Table 1 and this equality measure ranks Distributions B and D more equally than A. For the three new distributions, the coefficient of variation ranks F and G more equal than E which may also be in line with our intuitive judgments.

Note, however, that the coefficient of variation ranks F and G the same in terms of equality. The value judgment here (number eight, Table 1) is whether equal transfers change equality similarly regardless of where within the distribution these transfers take place. It can be shown that the coefficent of variation places the same weight on small transfers from one district to another regardless of the level of per pupil expenditure.[31] While this is a plausible assumption, others are certainly possible. For example, an alternative position is that transfers that affect the lower end of the distribution should be weighted more heavily than transfers at the higher end; in other words, Distribution F could be considered more equal than G. But we are clearly into an area where reasonable individuals could disagree. It should be pointed out that the coefficient of variation measures equality relative to the mean of the distribution.

8. Standard Deviation of Logarithms

An equality measure that does weight changes at the low end of the distribution more heavily than at the high end is the standard of deviation of logarithms. The formula for the standard deviation of logarithms where the student is the unit of analysis, is the following:

$$\left(\sum_{i=1}^{N} P_i \, (\log u - \log X_i)^2 / \sum_{i=1}^{N} P_i \right)^{1/2} ,$$

where u is the arithmetic mean per pupil expenditure, N is the number of districts, P_i is the number of pupils in district i, X_i is the mean per pupil expenditure in district i and the natural logarithm is employed.[32] The standard deviation of logarithms and the coefficient of variation rank Distributions A, B, C, and D identically. However, the ranks for Distributions E, F, and G are not the same. Due to the logarithmic transformation, Distribution F is more equal than G based on the standard deviation of logarithms. While the results may be in line with the values held by some, the use of a logarithmic transformation to achieve these results is somewhat arbitrary. Each of the equality measures discussed in this section weights transfers somewhat differently and each measure can be shown to be consistent with certain welfare functions but not others.[33] Finally, the standard deviation of logarithms is concerned with differences from the mean which is not the case for the next measures we consider.

9. Gini Coefficient

The final measure of equality that we will discuss is the Gini coefficient. This measure of equality, which is probably the most widely used, is based on the Lorenz Curve which is constructed as follows: If we order the population in terms of mean per pupil expenditures from low to high, we can plot this ordering on a graph using the percentage of the population on the X axis and the percentage of the expenditures accruing to the population on the Y axis. The plot for a distribution where expenditures per pupil are the same for the entire population will thus be 45° line, assuming equal units on each scale. Twenty percent of the population will receive twenty percent of the expenditures, thirty percent of the population will receive thirty percent of the expenditures; etc. If per pupil expenditures are not distributed equally then the distribution will be represented by a curve below the 45° line, X percent of the population

will receive Y percent of the expenditures and at some point X will be less than Y. The Gini coefficient is then defined as the percentage of the area below the 45° line that is between the Lorenz Curve and the 45° line. The lower the Gini coefficient the greater the "equality".

The Lorenz Curve for Distribution A, B, C, and E, F, G, are drawn in Figures 1 and 2 respectively.[34] Distributions B and E are drawn to scale, however, the curves for A, C, F, and G are not drawn perfectly to scale so that the relative positions of the curves can be seen more clearly. The ranking by the Gini coefficient of Distributions A, B, C, and D is in agreement with the rankings by the coefficient of variation and the standard deviation of logarithms as indicated in Table 5. Note that the relationships displayed by the computed measures are also revealed by the graphical representation. The area between the curve for Distribution B and the 45° line is less than the comparable area for either Distribution A or C.

For the second set of distributions, E, F, and G, the ranking by the Gini coefficient and the coefficient of variation are in agreement but there is a difference compared to the standard of deviation of logarithms. Although the rankings by the Gini coefficient and the coefficient of variation are the same, the weighting of transfers at different parts of the distribution is not always the same. The weighting of transfers implied by the Gini coefficient depends upon the shape of the distribution; the level of per pupil expenditures at which the transfer takes place and the number of pupils around the levels at which the transfer takes place impacts the weighteng.[35] Atkinson suggests, for example, that for usual income distributions a heavier weighting would be attached to transfers in the middle of the distribution using the Gini coefficient.[36] An additional property of the Gini coefficient is that it compares expenditures at each level with expenditures at every other level, not

FIGURE I

LORENZ CURVES FOR DISTRIBUTIONS A, B, AND C

(not drawn to scale)

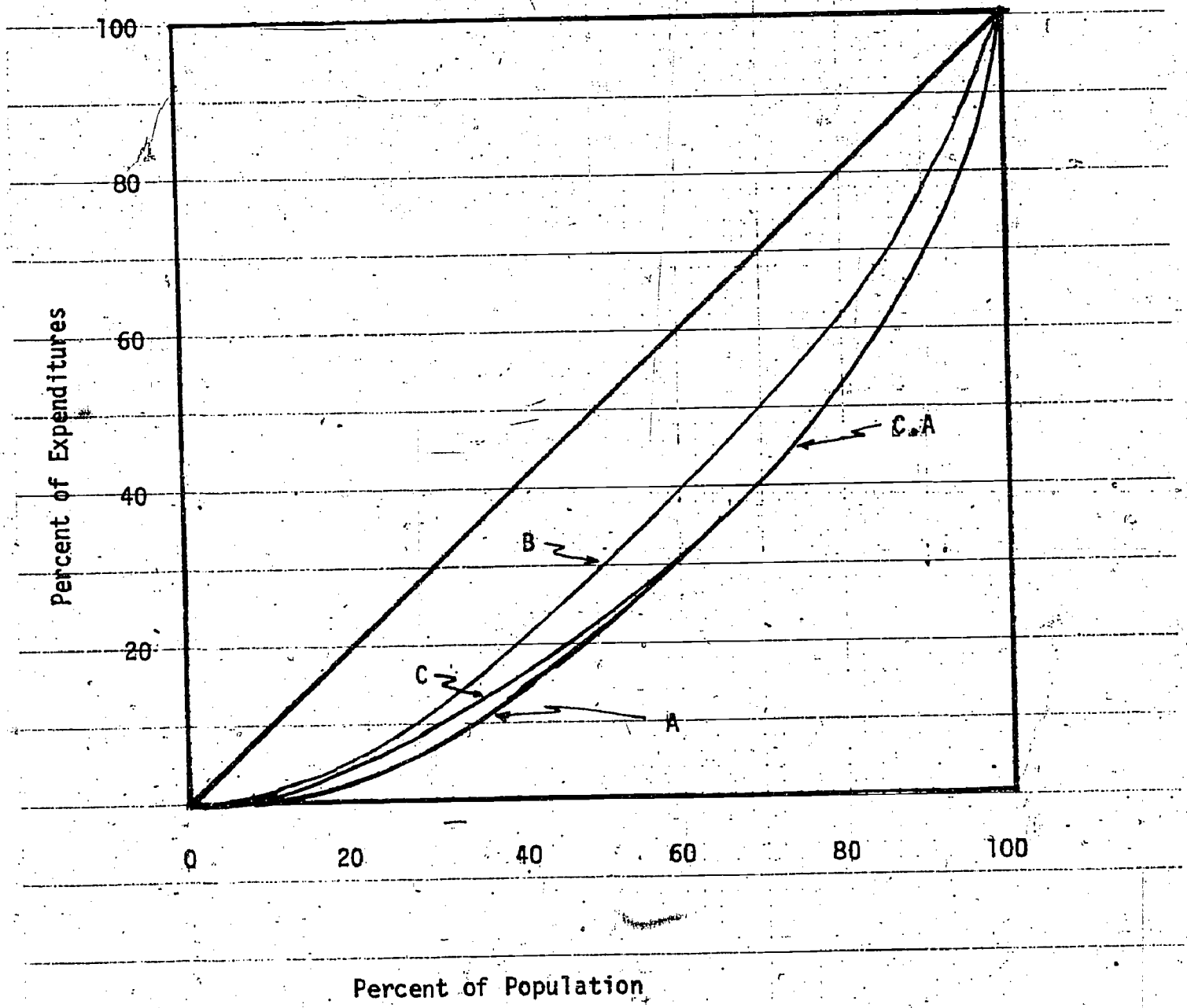
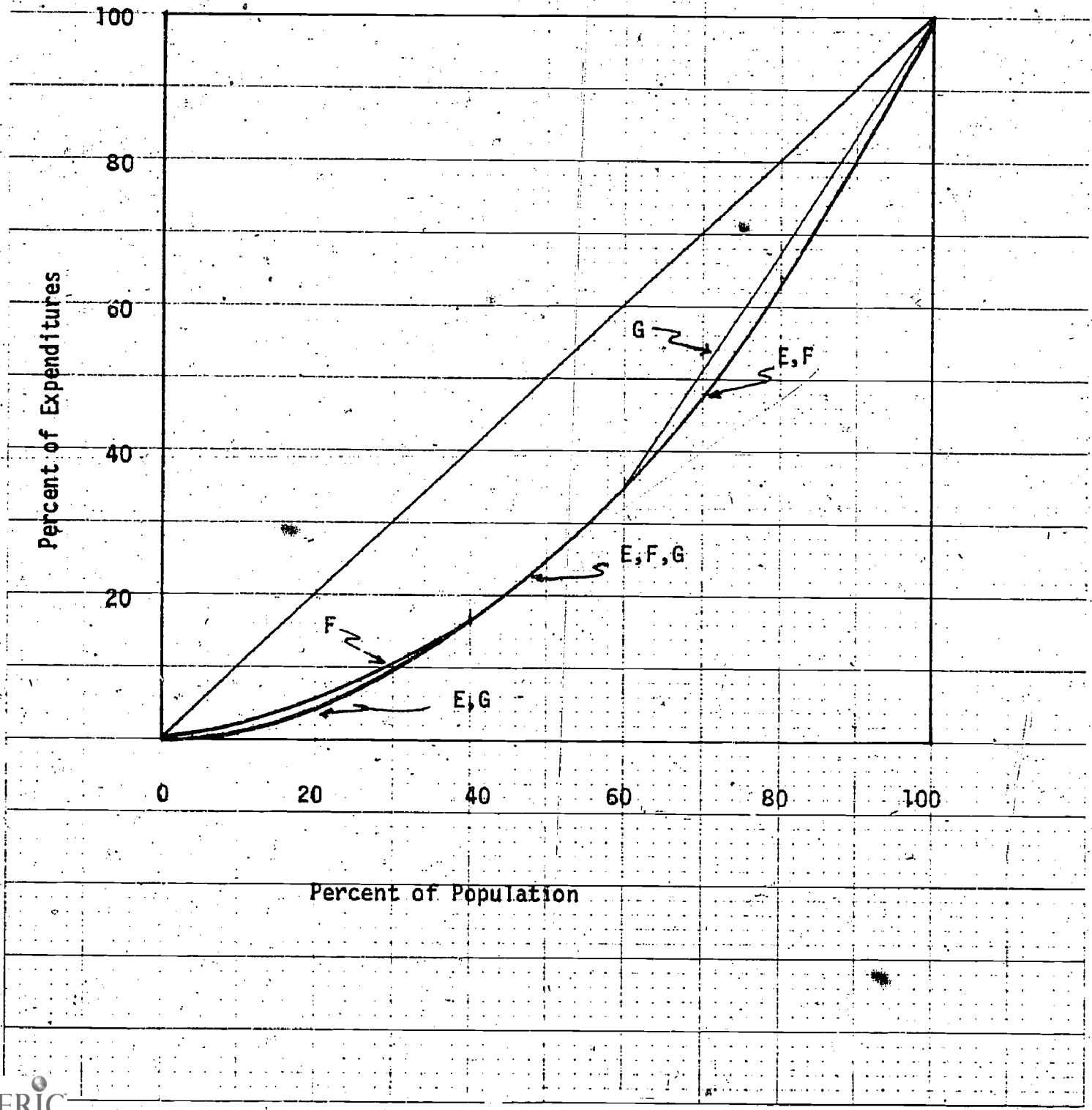


FIGURE 2

LORENZ CURVES FOR DISTRIBUTIONS E, F, AND G

(not drawn to scale)



37

just the mean which was the case for the standard deviation of logarithms and the coefficient of variation.

10. Summary

A number of value judgments and examples were utilized to assess nine equality measures that could be considered equity measures if all units in the distribution are considered equal. Certain measures appear to be more sensitive to transfers within the distribution and each measures uses a different set of weights to compare transfers at different levels of the distribution. The examination of these assumptions appears to be relevant for educational expenditures since some finance reforms can be viewed as transfers.

Although it is recognized that an individual may find any one of the nine measures consistent with his or her value judgments, if insensitivity to equal percentage increases is a desirable feature and if all the transfers discussed above should be reflected in the measure, then the coefficient of variation, standard deviation of logarithms and the Gini coefficient are all preferred. But we also showed that these three measures may conflict. Atkinson and Sen showed that for distributions with equal total expenditures, if the Lorenz Curve of one distribution lies totally above the Lorenz Curve of another (for example Distributions A and B) then one distribution will be considered less unequal than the other for a wide range of welfare functions and these three preferred equality measures will not conflict.[37] For income distributions Ranadive[38] shows that these three measures do conflict. We will consider this issue further when we examine empirical research on per pupil expenditures in the next section.

It should also be noted that the examination of the equality measures used rankings as the methodology for comparison. Although the equality measures are not intended to be used to measure the amount or degree of inequality, if the measures are used in this fashion then there can be considerable differences

in the measures even when the ranking is consistent. Table 8 shows the percentage difference in inequality for five pairs of distributions, measured by three inequality measures. The pairs of distributions were selected because the three inequality measures rank one member of the pair unambiguously more or less unequal than the other member. These data indicate that even when the rankings are consistent the possibility exists that the degree of inequality computed by the measures varies considerably.

B. Measures of Equity

The measures of equality outlined above can be considered measures of equity when the "working definition" of equity is the equal treatment of equals and all units in the distribution are considered equal. However, there are a number of reasons why certain students or districts might be treated as unequals and thus unequal treatment of unequals must be incorporated into the equity measures. Recall that two value judgments in addition to the measurement problems are encountered--What characteristics are relevant for the definition of unequals and what is the relationship desired between these characteristics and the argument of the equity function such as educational resources or educational expenditures. Four types of variables are discussed below that may qualify as a component in a valid definition of unequals for purposes of measuring equity for the educational system. The four types of variables include educational needs, technological characteristics of the districts, ability to pay, and an urban classification. For each of these variables we will consider the justification for their inclusion in an equity criteria, alternative mechanisms for quantifying the factor, and examples and suggestions for measurement techniques that include the factor in an equity criterion. Two additional issues, the question of taxpayer equity and the use of normative measures will be raised at the end of this part. Much of the discussion of

TABLE 8

PERCENTAGE CHANGE IN ENEQUALITY MEASURES
FOR PAIRS OF DISTRIBUTIONS

Pairs of Distributions	Coefficient of Variation	Standard Deviation of Logarithms	Gini Coefficient
B compared to A	-14.1%	-17.8%	-14.4%
C compared to A	-.4%	-7.5%	-1.4%
C compared to B	+15.9%	+12.6%	+15.2%
F compared to E	-.2%	-.9%	-.06%
G compared to E	-.2%	-.02%	-.06%

equity in this part is concerned with value judgments; claims of "science" do not get us around many of these.

1. Educational Needs

If our long run equity goal in the education sector is output oriented, that is we wish to give everyone the advantage of a "fair start", then it seems that a case could be made in favor of the recognition of special needs of segments of the student population. Certain student groups, in particular the handicapped and educationally disadvantaged, are found to "need" larger amounts of resources than others and to some degree these groups are currently identified in state and federal aid programs.[39] Other groups for whom an argument could be presented for educational needs include those requiring bilingual or bicultural education, drug education or adult education. In addition to the above arguments of need which are based on individual student characteristics, there are "needs" that are based on the process affecting the student. Examples of these need variables include the educational level of the student or student population (preschool, kindergarten, elementary, junior high school, etc.) or the nature of the particular program such as vocational or occupational. It should be apparent by this point that the educational needs category is potentially a large one but the eventual candidates for inclusion must be selected via value judgment.

Once the educationally needy groups are identified, their needs must be quantified. There is not a value free, scientific method to "determine" educational needs however, at least two alternative procedures are available to weight students according to their need. First, weights could be set based on an ideal--how different should spending or resources be for a certain population. The decision could be made by any group such as citizens, legislators or educational experts based on a "fair" level of inputs or an

expected level of outputs. Second, weights could be determined on a cost basis. Economic cost functions could be estimated to determine the additional cost of educating the handicapped, a larger percentage of high school students, etc.[40] The value judgment implicit here is that the existing adjustment for educational needs is the desired one. A varient of either procedure may be employed when an adequate measure of the relevant population with special needs is unavailable. In this case proxies for the needy group can be developed,[41] but once the proxies are selected the issue of the weights must still be confronted.

But once the groups are identified and the weights quantified, the needs can be incorporated into the equity criterion by calculating the equality measures described in Part A for weighted rather than unweighted students. Thus, the unequal treatment of unequals in terms of educational needs can be built into the equity criterion but the identification of the educational needs and the accompanying weights involves a series of value laden or political judgments. Weights can be "derived" using actual data on costs, weights can be borrowed from an existing fromula or a specific set of weights can be invented.

Other equity measures could be used for the case when only data for need proxies such as income or socioeconomic status are available. Bivariate measures such as the correlation coefficient or regression slope and wealth or income adjusted Gini coefficients[42] could be used and these are discussed further in sub-part 3, below.

2. Technological Characteristics of the District[43]

Certain districts may "need" more resources on account of the characteristics of the student but, in addition, there may be certain characteristics of the district which are separate from individual sub-groups of students that force certain districts to spend more dollars to obtain an equivalent level of

resources or outputs. District size, higher needs for transportation, higher needs for safety and security, etc., are all factors which may influence the technology or production function of the district. Note that price differences are not included here since the question of adjusting expenditures for supply prices was treated in Section II, above. Some of the issues are interrelated in practice although conceptually price and cost adjustments are separate.[44] Price adjustments, in theory, deal with differences in input prices while the cost of differences, in theory, relate to the conversion process of outputs from inputs. For purposes of this discussion we will assume that price adjustments are treated separately.

Probably, the most often discussed factor in this category is district size. The question can be posed as follows: Does an equivalent amount of expenditures or resources per student in districts of varying size produce different outputs? If so, should we adjust the equity measures to reflect the effect of district size? The answers are not easy. It may well be that smaller districts have smaller classes since they have fewer students per grade to allocate to classes but we would only infer that costs are higher for the small district if there were no commensurate benefits derived from smaller classes. Outside of the classroom there may be higher non-instructional costs for smaller districts due to certain economies of scale and for larger districts due to higher coordination costs,[45] however, there is still the question of whether the services to the students vary as well.

If cost differences among districts of varying size reflect commensurate output quantity or quality differences then size adjustments are not appropriate in equity measures; however, if cost differences among districts of varying size do not reflect these differences then size adjustments are appropriate in equity measures. In reality the "truth" probably lies somewhere

in between these two extreme positions and existing research cannot give us the precise adjustments. The question of an adjustment for size (or other technological factors) becomes a value judgment.

If an adjustment factor for size can be arrived at, then the size adjustment can be built into the equality measures developed in Part A through a weighting scheme. However, if size differences are judged to be important but impossible to quantify, then Pugh et al. suggest that a way to take this into account is to group districts by size and compute inequality measures within each district size group.[46] There are two problems with this technique. First, this assumes that resource or expenditure differences that vary according to size are due entirely to size differences. If other variables also vary simultaneously with size, these variables can no longer be examined across all districts. Second, as discussed above, this adjustment assumes that there are no output or quality differences associated with the cost differences by size.

While future multivariate research may contribute to our knowledge of the effects of size and other technological factors on output differences, the current adjustments could be considered "guesstimates" or value judgments. The other technological factors discussed above could be treated in a parallel fashion.

3. Ability to Pay

Up to this point we have assumed that equity is defined as the equal treatment of equals unless a case can be presented for the unequal treatment of unequals. However, the recent series of court cases involving public educational finance have taken a somewhat different approach. The courts, for the most part, have not been concerned with equality or equity as we have defined it, but rather equity or equality related to certain characteristics of

a district, namely wealth or ability to pay, and this definition is often called fiscal neutrality. The working definition of equity used in this paper starts with the assumption that all students are equal, and considers exceptions to this principle. Most court definitions, on the other hand, view inequality associated with wealth as inequitable but other inequalities that are not associated with wealth are permissible. Note that the court definition follows from a point of view that treats the parents and child (or family) as the unit of analysis. Once the parents' "right" to spend more or less on a child is considered "just", then the definition of equity centers on the definition of "unjust" differences and wealth related disparities appears to be the primary unjust difference so defined by the courts. The historical role of the "local control" of schools clearly has played a part in this definition.

If the court definition of equity is accepted, how can equity be measured? First, the issue of ability to pay and its definition must be dealt with. A central component of this issue is whether income, wealth, or some combination is the most appropriate measure of ability to pay. A related issue is whether the ability to pay measure should be examined on a per capita or per student basis.[47] The various methods of defining ability to pay and their advantages and disadvantages are too lengthy to discuss here. However, this is another value judgment that must be made and the selection does make a difference.[48]

If we assume that the question of how to measure the ability to pay is answered, we then must confront the issue of how to specify and measure the relationship between education and the ability to pay. This issue may be separated into two parts; what is the appropriate relationship and how are we to measure it. The appropriate relationship issue is raised by a number of researchers on school finance who have pointed out that even when a state aid formula is designed to theoretically remove the effect of ability to pay (or "wealth"), for example, by using a district power equalizing formula, there

still may be an observable relationship between educational measures such as expenditures and ability to pay.[49] This comes about because the "theoretical removal" assumes that all districts will use the same tax rate, which is not the case empirically. Friedman and Wisemen define two measures of wealth neutality depending upon whether the theoretical relationship (with a constant tax rate) or the empirical relationship is examined.[50] The specification of the relationship again must be decided upon as a value judgment.

The final issue[51] we must confront is how to measure the relationship between education and the ability to pay and there are a number of measures that have been proposed. One set of measures is based on the simple correlation between expenditures and ability to pay. For example, if there is not a systematic relationship between expenditures and ability to pay the simple correlation will be zero; if expenditures are higher (lower) with higher ability to pay the correlation will be positive (negative). However, Michelson argues that the correlation coefficient is not the "correct" bivariate measured but instead, the regression coefficient or slope should be used.[52] Since, for simple regression, $b=r\frac{S_E}{S_A}$, where r is the correlation coefficient, b is the slope coefficient and S_E and S_A are the standard deviations of expenditures and ability to pay, respectively, if there is some variance in expenditures, then when r equals zero, b equals zero, and the sign on r equals the sign on b so that for this information the two measures are equivalent. However, Michelson explains further that the slope more accurately measures the relationship while the correlation measures the goodness of fit so that it is the slope that should be used. Friedman and Wiseman also point out that the relationship between expenditures and ability to pay may not be constant over the range of ability to pay, so the slope from a polynomial functional form may be more appropriate than a simple regression.[53] The slope can then be measured at different levels of ability to pay or the difference between the

predicted levels of expenditures at two levels of ability to pay can be computed. Since the slope and correlation present different measures, it may be advisable to use both.[54]

An alternative measure of the relationship between expenditures and ability to pay has been suggested by Hickrod et al. where a Gini coefficient is calculated by ordering districts by ability to pay rather than increasing expenditures.[55] Note that for the "wealth computed Gini coefficient" there could be considerable inequality but only the inequality related to wealth will be included in this measure. Michelson's objection to the correlation measure should not hold for this measure since it can be shown that two distributions with different slopes and identical correlations between expenditures and wealth will have different wealth computed Gini coefficients and the distribution with the higher slope (more inequality) will have the higher wealth adjusted Gini (more inequality). Two final points concerning this measure are first, that it obviously includes the weighting scheme employed by the Gini coefficient and it was shown in Part A of this section that other weighting schemes may be more in line with our value judgments and second, there are potential measurement problems if the Lorenz Curve crosses the 45° line.

Thus, if we view ability to pay as a component of an equity criteria we must decide how to measure ability to pay, how to specify the relationship between education and ability to pay and how to measure the relationship.

4. An Urban Adjustment

For a number of reasons, school districts in large cities have received special attention. In the context of the analysis in this section, the question must be asked why expenditures should be different in the cities. That is, what is it that suggests that city schools districts should be treated unequally.

First, it may be the case that many of the adjustment factors discussed above, if quantified, would show that the cities have higher "needs". If expenditures are adjusted by prices to represent resources then the dollars may buy less in the cities due to higher prices. If students are weighted to reflect need (handicapped, educationally disadvantaged, etc.), it is likely that cities would receive a higher student weighting. Furthermore, certain technological factors including size, security requirements, transportation costs, etc. may make the cities appear more deserving on these dimensions. Finally, on the ability to pay criteria, while cities are not often classified as poor in a property value or wealth sense, an argument is often made that the cities have to provide additional services that are often costly and therefore they are overburdened.

Given the range of factors that may enter our equity consederations, it is apparent that the urban classification is probably suggested as a "proxy" variable for some combination of the needs variables outlined above. Therefore, to the degree that our equity criteria ignore these factors, then perhaps a special examination of the urban districts is in order. In terms of measurement, it may be appropriate to display the expenditures in urban districts separately as well as to include them in the total so that the level of expenditures in the urban areas is highlighted.[56] Or, if we believe that municipal overburden should be taken into account we can attempt to compute an index of municipal overburden.[57] However, note that if we take a student point of view and do not consider ability to pay, then issues such as municipal overburden, since they affect revenues rather than expenditures do not directly impact our equity or equality measures.[58]

5. Taxpayer equity

The issue raised in this section is taxpayer equity. Revenues for education

are raised mostly from local and state taxes and different taxes may be more or less equitable. In other words, two distributions may be identical from the expenditure side, but different from the revenue side due to the incidence patterns of the taxes used to raise the resources. However, since the student viewpoint has been used here, the direct impact of taxes has not been taken into account since students do not pay taxes. However, even with this point of view tax incidence (and municipal overburden) may have an impact since parents (and non-parents) pay taxes and, to some degree, higher taxes, ceteris paribus, may subtract from the available reaources for the education process that takes place outside of the schools.

While we may provide a rationale for the separation of expenditures and revenues in terms of equity, this separation points out that the student point of view leads us to a partial analysis. Information on taxpayer equity should accompany the equity measures discussed here for completeness. But the issues of tax incidence are complex and require a different set of value judgments that will not be discussed here due to limitations of time and space.[59]

6. Normative measures

The final issue we will consider in this section is the use of normative or distribution based measures. Each of the measures discussed for equality and equity use elements of the measured distribution such as the mean or median for comparison and the definition of complete equality or equity is relatively straightforward. An alternative approach is to consider a distribution other than complete equality as the desirable standard and then measure the degree to which the actual distribution differs from the desired one. Since the establishment of a desired distribution other than equality is an extremely hazardous value judgment, these distribution based measures will not be discussed further here.[60] It should be noted that the establishment of a cut

off or value of the equity or equality measure that represents equity or equality is a related issue.

We have now considered a range of equality and equity measures that employ a range of value judgments. The review thus far has indicated that reasonable individuals may disagree over the relevant value judgments; the alternative value judgments lead to different equity and equality measures; and conceptually, the conclusions drawn from the various measures may conflict. In the next section we examine selected studies of education distributions in order to determine whether our conceptual concerns appear to be valid for actual data.

IV. An Empirical Comparison of Equality and Equity Measures

The articulation of a working definition of equity has resulted in multiple measures. However, the use of multiple measures may not be appropriate if the conceptual differences among the measures are not apparent for data from actual educational systems. Therefore, in this section we will briefly examine, from a methodological viewpoint, the performance of a range of equity and equality measures by reviewing a number of published studies that have computed alternative equity or equality measures for distributions of educational expenditure or resources. Studies have been reviewed in order to document cases in which the equity or equality measures can yield different conclusions. Differences will be examined for the determinants of different equality measures, the results yielded by equality compared to equity measures, the results yielded by different equality measures, and the results for different arguments of equity functions.

First, Grubb and Michelson[61] compare the determinants of intrastate inequality across states using several different equality measures. The relevance for this section is not the specific effects of independent variables but the observation

that the same set of independent variables explains different amounts of the variance in the alternative equality measures and the effects of the independent variables appear different when a range measure compared to the Gini coefficient is used as the dependent variable measure of inequality. This would provide some evidence that the range measure and the Gini coefficient are different for district level data.

Second, Grubb and Michelson[62] develop a simulation model to examine the outcomes of various school finance reforms in Massachusetts. For each simulation of per pupil revenues they examine the Gini coefficient, the ratio of per pupil revenues for rich compared to poor families, the correlation between wealth, measured as property values, and revenues, the correlation between district income and revenues, and the average revenue for large cities. Numerous simulations are presented and, although there are cases where a particular simulation appears to be more equitable than the existing situation on all equity measures, there are other cases where a number of the measures move in opposite directions. In particular, there are cases where the ranking of two distributions that result from using the Gini coefficient, an equality measure and thecorrelation between wealth and per pupil revenues, an equity-ability to pay measure, conflict. This provides us with empirical evidence that equality and ability to pay equity measures can conflict within the context of school finance reform.[63] An additional example of a conflict between equality and equity measures is provided by Berne.[64] Using actual and simulated data from Missouri[65] it was shown that there were a number of conflicts among eight distributions when they were ranked using a regression based ability to pay (wealth) equity measure and any one of the equality measures considered in Section IIIA above. When the regression based ability to pay equity measure was used in conjunction with five equality measures only four overall rankings emerged for

eight distributions due to conflict among the measures.[66]

The third observation is based on the evaluation of the school finance reform in Illinois in 1973 by Hickrod et al.[67] A number of measures of equity and equality were derived and computed before and after the reform. Of particular interest is the comparision of two measures of equality; the coefficient of variation and the permissible variance. The coefficient of variation shows that there is greater equality after the reform for elementary districts however the permissible variance measure indicates greater inequality after the reform. In this case, two equality measures yield conflicting results before and after a school finance reform. Berne's analysis of Missouri also demonstrated that conflict could exist among the equality measures discussed in Section IIIA.[68]

The final observation is based on the empirical analysis performed by Pugh et al.[69] The comparison to note here is not among different measures of equity and equality but among different arguments of the equity function, in particular expenditures versus resources. An inspection of the various tables in this analysis shows that the size of the equality measures are affected by the alternative arguments. When four distributions of expenditures per pupil for Missouri were adjusted for price differences it was concluded that the distribution appeared more equal but the magnitude of the change varied according to the equality measures.[70]

These selected studies have shown that the results of an equity analysis of educational expenditures and resources does depend on the particular way in which equity is measured. These and other studies indicate that potentially the measure can make a difference and the conceptual issue discussed here have implications for policymakers who must compare distributions.

V. Implications for Policy Analysis

This paper has presented a methodological analysis of a number of conceptual issues that need to be addressed by policy analysts who have as one of their goals the measurement of the equity of the public educational system. Due to the nature of equity and the educational system, the task of bringing these ideas together is complex. On account of this complexity, the overriding conclusion for policy analysts is that they should be prepared to use alternative approaches to the measurement of equity. This type of sensitivity analysis is not meant to generate a probability distribution around a "correct" value, but to cover the wide range of possible interpretations of equity, each of which may be "correct". Each of the topics discussed above contributed to the need for multiple measures.

First, a specific definition was used to establish what is meant by equity. However, other definitions are possible and these could lead to the alternative measures of equity. Combined with the definition of equity was the initial decision to pursue equity from a student point of view. But other points of view are plausible including the school district or the family. The latter approach would lead to a more detailed consideration of taxation than evolved from the student approach.

The second issue that leads to a conclusion to employ alternative measures is the consideration of what we want to be equitable. While we can measure dollars that purchase inputs for the educational process straightforwardly, these dollars may not be comparable measures of resources across districts; and resources may not be comparable measures of outputs. This issue is really a dual problem: first, do we want dollars, resources, or outputs to be equitable and second, how do we measure these various concepts. The difficult conceptual and measurement issues again lead to the

recommendation to use alternative approaches. One particular concern, the adjustment of dollars for varying prices has received attention recently and also, the use of resource measures is at least feasible. It appears that different arguments of an equity criteria lead to somewhat different conclusions so that the energy needed to pursue a multiple approach is justifiable, at present.

Third, if we decide that the notion of equality, as discussed above, is useful as a definition of equity, then again we are faced with a number of alternative measures and it is very difficult to get agreement on a single measure due to the range of value judgments involved. If a single measure is not appropriate either conceptually or empirically, then the use of a set of measures may enable the policy analyst to highlight the distributions that are unambiguously more equal than others, and indicate those that are indistinguishable. For example, certain school finance reforms may produce more equality regardless of how we measure equality whereas other reforms may have a more ambiguous effect on equity. Once the requisite data are available, the additional cost of computing alternative equity measures is not great.

Fourth, equality measures are not the only reasonable measures of equity we discussed. In particular, student needs, technological characteristics of the district, the ability to pay or a concern for a particular type of district such as the cities may direct us to somehow alter our measures of equality. But for each specific issue we are faced with numerous alternatives each of which may be in line with an individual's definition of equity. Furthermore, we concluded above that for one important type of equity measures--ability to pay equity measures--the way in which we measure both ability to pay and the relationship between ability to pay and education has an impact on our assessment of equity. Since many of these issues are not resolvable without

recourse to value judgments, and the particular value judgments make a difference, the policy analyst must again investigate a range of measures.

Fifth, the need for both equality and equity measures is highlighted by the findings that there can be considerable conflict between these two different groups or classes of measures. This reinforces our recommendation to employ alternatives.

Finally, one critical issue that has not been taken into account in this analysis is the comparability and availability of data. If available data are not comparable, then not only value judgments but comparability problems could cause differences among measures. For example, comparability problems could arise among distributions if student counts are arrived at through different weighting schemes, districts are organized differently, or if districts do not all perform the same type of services to similar student populations. Data comparability problems do have the potential to confuse an already complex issue.

FOOTNOTES

1. This paper was funded by the Ford Foundation. The paper represents the opinion of the author and should not be attributed to the Ford Foundation. Helpful comments on some of the thoughts expressed here were received from John Augenblick, Lee S. Friedman, Alan Odden, Leanna Stiefel, Esther O. Tron, Phillip E. Vincent and Mary Williams. Remaining errors are obviously the author's.

2. The literature on equity and public education appears to be growing at an accelerating rate. For an introduction to this area see B. Levin, ed., Future Directions in School Finance Reform (Lexington, Mass: Lexington Books, 1974), J. Pincus, ed., School Finance in Transition (Cambridge, Mass: Ballinger, 1974) and J. J. Callahan and W. H. Wilken, eds., School Finance Reform: A Legislator's Handbook (Washington, D.C.: National Conference of State Legislatures, 1976). For an analysis and primary sources such as court opinions and state and federal commission recommendations, see J. S. Berke, Answers to Inequity (Berkeley: McCutchen, 1974).

3. Although this paper focuses entirely on education, many of the issues are relevant to other policy areas. For treatments of equity issues in areas other than education, see R. L. Lineberry and R. E. Welch, Jr., "Who Gets What: Measuring the Distribution of Urban Public Services," Social Science Quarterly, 54 (1974) pp. 700-712 and A. E. Merget, "Equalizing Municipal Services: Issues for Policy Analysis," Policy Studies Journal, 4 (1976) pp. 297-306.

4. Throughout this paper the term argument is used in a specific manner. An equity or equality measure can be specified as a series of calculations performed on a particular type of data. The specification of the calculations and the type of data are both necessary for a complete description of a particular measure. The type of data that is used in the calculation is the argument of the equity or equality measure or criteria. For example, for the equality measure specified as the range of per pupil expenditures the range is the calculation and the argument is the distribution of per pupil expenditures.

5. See Berke, p. 163, who notes that, "Treating unequals equally is a highly questionable definition of equity."

6. See S. Michelson, "What is a 'Just' System for Financing Schools? An Evaluation of Alternative Reforms" in B. Levin, ed., Future Directions.

7. H. M. Levin, "Equal Educational Opportunity and the Distribution of Educational Expenditures," Education and Urban Society, 5 (1973) pp. 149-172.

8. For a description of this conceptualization of the schooling process see H. M. Levin, "The Effect of Different Levels of Expenditure on Educational Outputs" in R. L. Johns et al., eds., The Economic Factors Affecting the Financing of Education (Gainsville, Florida: National Education Finance Project, 1970); H. M. Levin "Effects of Expenditure Increases on Educational Resource Allocation and Effectivenes," in J. Pincus, School Finance.

9. For a more indepth discussion of these issues see R. Berne, "Equity and Public Education: Conceptual Issues of Measurement", Public Policy Research Institure, Graduate School of Public Administration, New York University, New York, NY, Working Paper No. 4, (October, 1977), pp. 5-9.

10. For a discussion of school finance and equity, see, in addition to the references in footnote 2, M. S. Feldstein, "Wealth Neutrality and Local Choice in Public Education," American Economic Review, 65 (1975) pp. 75-89, L. S. Friedman and M. Wiseman, "Toward Understanding the Equity Consequences of School Finance Reform," Graduate School of Public Policy, University of California, Berkeley, Working Paper #75 (July, 1977), W. N. Grubb and S. Michelson, States and Schools (Lexington, Mass: Lexington Books, 1974) G. A. Hickrod, B. C. Hubbard and T. Wei-Chi Yang, "The 1973 Reform of Illinois General Purpose Grant-in-Aid: A Description and Evaluation," in E. O. Tron, ed., Selected Papers in School Finance, 1974 (Washington, D.C.: Office of Education, 1974), A. Odden and P. E. Vincent, Analysis of the School Finance and Tax Structure of Missouri: Background Research of the Educational Finance Committee of the Governor's Conference on Education (Denver: Education Commission of the States, 1976), L. Stiefel, "Per Pupil Expenditures and Tax Incidence Under Michigan's Modified Power Equalization School Finance Plan," Michigan State University, 1975.

11. Notice that certain assumptions about holding everything constant are necessary if a comparison of equity before and after a reform is to be used to assess the impact of the reform. For further discussion, see G. A. Hickrod et al.

12. For more on the local response, see L. S. Friedman and M. Wiseman, and W. N. Grubb and S. Michelson and H. Ladd, "State-Wide Taxation of Commercial and Industrial Property for Education," National Tax Journal, 29 (1976)pp. 143-153.

13. See H. Brazer, "Adjusting for Differences Among School Districts in the Costs of Educational Inputs: A Feasibility Report, " in E. O. Tron, ed., Selected Papers in School Finance, 1974, H. Brazer and A. P. Anderson, "A Cost Adjustment Index for Michigan School Districts," in E. O. Tron, ed., Selected Papers in School Finance, 1975 (Washington, D.C.: Office of Education, 1975), J. G. Chambers, A. Odden and P. E. Vincent, Cost of Education Indices Among School Districts (Denver: Education Commission of the States, December, 1976), W. N. Grubb and J. Hyman, "Constructing Teacher Cost Indices: Methodological Explorations With California Unified School Districts," in E. O. Tron, ed., Selected Papers in School Finance, 1975, L. W. Kenny, D. Denslow and I. J. Goffman, "Measuring Differences Among the Florida School Districts in the Cost of Education: An Alternative Approach," in E. O. Tron, ed., Selected Papers in School Finance, 1975 and E. O. Tron, "Introduction and Summary," in Selected Papers in School Finance, 1975.

14. Kenny et al. pp. 197 ff.

15. Ibid.

16. W. N. Grubb and J. Hyman, pp. 116-118. They also compute an index based on average salaries, a technique that assumes that all price differences reflect resource differences, and find the correlations with the measures using alternative assumptions vary between .45 and .86.

17. G. E. Pugh, J. N. Killalea and B. Loatman, Educational Opportunity. The Concept, Its Measurement and Resource Disparities in 1970, Report to National Center Educational Statistics, September, 1976. The measure discussed here is labeled M4 in their report (p. 63 ff)

18. Pugh et al. treat quality differences across districts in a more "refined" measure but this procedure is equivalent to using a regional and urbanization price index. While this price index may be plausible, it is only one of a range of possibilities that produce different results, as discussed above. Furthermore, Pugh et al., p. 65, indicate that their analysis of the results of the refined measure suggests that it "probably did not produce any improvement over" the resource measure discussed in the text.

19. Ibid., pp. 73 ff.

20. M. A. Golladay, The Condition of Education, 1976 edition (Washington, D. C.: National Center for Educational Statistics, U. S. Government Printing Office, 1976).

21. Parts of this section are based on R. Berne and R. Schramm, "Equity Analysis," Unpublished paper, 1975, A. Sen, On Economic Inequality (New York: W. W. Norton, 1973), and A. B. Atkinson, "On the Measurement of Inequality," Journal of Economic Theory, 2 (1970) pp. 244-263

22. The terms equality measures and inequality measures are used interchangeably.

23. Intradistrict inequalities can also be measured using the same techniques discussed in this section if data on individuals rather than districts are available. The limitations is in the data, not the techniques. For more on intradistrict inequalities, see H. S. Winokur, Jr., "Expenditure Equalization in Washington, D. C. Elementary Schools," Public Policy, 24 (1976) pp. 309-335.

24. Another term for "insensitive to percentage increases" is "mean independence." See A. B. Atkinson.

25. The interested reader is urged to consult A. Sen. For example, when we compute the amount of the inequality difference we are using interpersonal comparisons with cardinal utility functions. It could be argued that the inequality measures were not intended to be used in this way.

26. See Federal Register, March 22, 1977, Part II.

27. If P_i equals one or any constant or if the district is the unit of observation, the formula for the relative mean deviation is the following:

$$\sum_{i=1}^{N} \left| u - X_i \right| \Big/ Nu.$$

28. See G. A. Hickrod, et al. They credit Professor McCloone for the development of this index. For related measures based on the mean, see L. Stiefel.

29. If P_i equals one or any constant or the district is the unit of observation, the formula for the permissible variance is the following:

$$\frac{\sum_{i=1}^{J} X_i}{JM}$$

30. If P_i equals one or any constant or the district is the unit of observation the formula for the variance is the following:

$$\sum_{i=1}^{N} (u - X_i)^2/N.$$

31. See A. Sen, p. 28.

32. If P_i equals one or any constant or the district is the unit of observation the formula for the standard deviation of logarithms is the following:

$$\left(\sum_{i=1}^{N}(\log u - \log X_i)^2/N\right)^{1/2}.$$

33. See A. Sen and A. B. Atkinson.

34. Note that since the Lorenz Curve is not affected by equal percentage increases the Lorenz Curve for Distribution D is identical to the one for Distribution B.

35. See A. Sen for a discussion of the weighting implicit in the Gini coefficient.

36. A. B. Atkinson, p. 256.

37. See A. Sen and A. B. Atkinson.

38. K. R. Ranadive, "The Equality of Incomes in India," Bulletin of the Oxford Institute of Statistics 27 (May, 1965) reproduced in A. B. Atkinson.

39. For a summary of state and programs, see E. O. Tron, Public School Finance Programs, 1975-76 (Washington, D.C.: Office of Education, U. S. Government Printing Office, 1976). See L. C. Pierce et al., State School Finance Alternatives: Strategies for Reform, (Eugene, Oregon: Center for Educational Policy and Management, University of Oregon, May, 1975), especially Chapter 5, for a detailed discussion of the different groups of students with special educational needs.

40. For an example, see J. G. Chambers et al.

41. Title I, for example, uses measures of AFDC households and households with low incomes for measures of educationally disadvantaged. For an empirical investigation of a set of needs proxies, see W. F. Garms and R. J. Goettel, "Measuring Educational Need: Developing a Model for Predicting Achievement Levels from a Composite of Socioeconomic Scores," in J. S. Berke, A. K. Campbell, and R. J. Goettel, eds., Financing Equal Educational Opportunity (Berkeley, Cal.: McCutchan, 1972).

42. See G. M. Hickrod et al., p. 36 ff.

43. A number of ideas in this section may be found in S. Michelson.

44. See Chambers et al. for the development of price and cost indices.

45. See Chambers et al. and Pugh et al. for empirical evidence suggesting a U-shaped cost curve.

46. See Pugh et al.

47. For more on the issue of fiscal capacity or ability to pay, see J. S. Aiken, "Fiscal Capacity and the Estimation Method of the Advisory Commission on Intergovernmental Relations," National Tax Journal, 26 (1973) pp. 275-291, and W. D. Morgan, "An Alternative Measure of Fiscal Capacity," National Tax Journal, 27 (1974) pp. 361-365. For a discussion and analysis of the relationship between ability to pay and school finance, see A. Odden, Alternative Measures of School District Wealth (Denver: Education Commission of the States, December, 1976) and J. F. Gatti and L. J. Tashman, "Equalizing Matching Grants and the Allocative and Distributive Objectives of Public School Financing," National Tax Journal, 29 (1976) pp. 461-476.

48. See A. Odden, PP. 22-26.

49. See M. Feldstein; L. S. Friedman, "The Ambiguity of Serrano: Two Concepts of Wealth Neutrality," Hastings Constitutional Law Quarterly, 4 (Summer 1977), L.S. Friedman and M. Wiseman, and W. N. Grubb and S. Michelson.

50. See L. S. Friedman and M. Wiseman, pp. 10-12.

51. The discussion in the remainder of this sub-part is appropriate for alternative measures of ability to pay and either the theoretical or empirical (observed) relationship.

52. See S. Michelson.

53. L. S. Friedman and S. Wiseman, p. 33.

54. See Pugh et al. and R. Berne for recent studies where correlation and regression type measures were computed.

55. See Hickrod et al., p. 36.

56. See, for example, G. A. Hickrod et al. and W. N. Grubb and S. Michelson.

57. See, for example, A. Reschovsky and J. Knickman, "Municipal Overburden in New Jersey: An Assessment," paper prepared for The Urban Education Observatory and the New Jersey Department of Education, December 1976. Of course, there are value judgments built into the computation of this type of index.

58. For an analysis of the tax burden and revenue changes in large cities that result from alternative school financing plans, see D. Netzer, "State Education Aid and School Tax Efforts in Large Cities," in E. O. Tron, ed., Selected Papers in School Finance, 1974.

59. For a general discussion of tax equity, see A. Odden and P. E. Vincent, "The Regressitivity of the Property Tax," (Denver: Education Commission of the States, December 1976) and J. A. Pechman and B. A. Okner, Who Bears the Tax Burden, (Washington, D.C.: Brookings, 1974). For a discussion of tax equity and school finance, see A. Odden and P. E. Vincent, School Finance in Missouri, especially Chapter 4, and L. Stiefel.

60. The interested reader should consult G. Busch, "Inequality of Educational Opportunity by Social Origin in Higher Education," in Education, Inequality and Life Changes, Vol. I. (Paris: OECD, 1975) or C. Hackling, "Disparity Measures for School Expenditures," unpublished paper, School of Education, Stanford, 1977.

61. W. N. Grubb and S. Michelson, Table 4-5.

62. Ibid., Tables 8-4 to 8-7.

63. For more on this conflict, see L. S. Friedman and M. Wiseman.

64. See Berne, pp. 49-66.

65. The data from Missouri were provided by Alan Odden and Lora Lee Rice, Education Commission of the States.

66. See Berne, p. 66.

67. See Hickrod et al.

68. See Berne, pp. 55-58.

69. See Pugh et al.

70. Berne, pp. 52-55.

SCHOOL FINANCE REFORM IN THE SEVENTIES

ACHIEVEMENTS AND FAILURES *

I. Introduction

The early 1970's marked a period in which increased attention was directed to disparities in resources and tax burdens among school districts in the States. The school finance literature now abounds with studies of the States that legislated changes in their financing arrangements in this period. It is difficult to discern from the literature, however, the extent of the problem nationally or the effects of reform where it has occurred. Most studies examine one or a few States. Because many of the studies are intended to assist in the design of new features of a financing program, they naturally concentrate on the mechanisms of reform rather than its effects. And because different methodologies are used, the studies cannot readily be compared or aggregated.

The study reported here attempts to obtain a national assessment of the impact of reform. It looks at all States using the same measurement methods and the same data, so that it is possible to contrast one reform State with another and to compare reform States as a group with the non-reform States. It examines results rather than mechanisms -- results expressed in terms of the distribution of education funds. It examines these distributions in 1970, before the reform movement got under way, and in 1975, by which time its initial impacts could be expected to have registered.

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* This paper reports on a joint project of the U.S. Department of Health, Education, and Welfare, and of Killalea Associates, Incorporated. The authors are: Lawrence L. Brown, III; Alan L. Ginsburg; J. Neil Killalea, Richard A. Rosthal, and Esther O. Tron. Views expressed do not necessarily reflect positions of the Department.

II. Disparity Changes: 1970 to 1975

Methodology

Resources are defined here as the portion of current operating expenditures (COE) per pupil that is supported from non-Federal sources. COE includes a large part of educational resources; excludes capital outlays, which could otherwise make resources appear to be very high in the year of outlay; and is readily available in national data bases. Expenditures are based, of course, on revenues collected from all sources, including the Federal government. Since the purpose of this study is to examine the distribution of local and State funds, COE is adjusted to remove Federal revenue.[1] The exception is Federal impact aid, which is treated here as local revenue.[2]

Although educational expenditures are often employed as though they were equivalent with educational resources, they are not the same. The difference arises principally from the fact that a dollar buys different levels of real educational resources in different parts of a State. Techniques are now under study for identifying and adjusting for the varying costs of education throughout a State, but it has not been possible to apply them in the present study.[3] This shortcoming affects the analyses discussed below differentially, as will be pointed out in a review of the results.

All district expenditures are stated on a per-pupil basis. States count pupils in different ways. Some use average daily attendance (ADA), some use average daily membership (ADM), and some use a combination.[4] Rather than impose one or the other of these measures on all States, this study employs whatever measure the State has used.[5]

The study uses data bases for 1970 and 1975 that provide comparable and generally adequate data.[6]

Changes in Overall Disparity

It is generally thought that the perceived extent of disparity depends, perhaps greatly, on the measure employed. Three statistical measures sometimes used by school finance analysts were considered for use in this study: the coefficient of deviation, the coefficient of variation, and the Gini index.[7] In addition, a fourth measure was included because it is embedded in a Federal regulation: the ratio of expenditures at the 95th percentile of students to expenditures at the 5th percentile.[8] The three statistical measures are, for all intents and purposes, identical in their results, and even the 95:5 ratio is very highly correlated with each of the statistical measures, as the tabulation from our 1975 data shows:[9]

	95:5 Ratio	Coeff. Dev.	Coeff. Var.	Gini Index
95:5 Ratio	1	.83	.85	.89
Coefficient of Deviation		1	.95	.98
Coefficient of Variation			1	.97
Gini Index				1

This study uses the 95:5 ratio and the coefficient of variation.* A value for the 95:5 ratio of, say, 2.5 means that students at the 95th percentile receive two and one-half times the expenditures of those at the 5th percentile. A value for the coefficient of variation of 12.4 means that approximately one-sixth of the students in the State receive at least 12.4 percent more expenditures than the State average and one-sixth receive at least 12.4 percent less than the average.

* See Appendix A, Tables A-1 and A-2, "Within-State Disparities for Four Equalization Measures", 1970 and 1975.

Table I presents, for each State, the disparity in 1975 and the percent change between 1970 and 1975, for the two measures. The States with the greatest disparity in 1975 show no regional patterns, including States from every part of the country. They do include, however, several of the nation's largest States. The 12 States with the greatest disparity in 1975 enroll approximately 38 percent of the nation's public school students. At the opposite end of the ranking, States with the least disparity tend to be those with the smallest populations, the only exception being Florida. It is noteworthy that the six States with the least disparity also operate relatively few school systems.[10]

Among the 12 States with the greatest disparities in 1975, only Vermont exhibits a large decrease in disparity — but it must be pointed out that Vermont's starting point in 1970 was extremely unequalized.

Some States clearly progressed, while others worsened. There are several ways of gauging progress nationwide. One is to compare the number of States that decreased or increased by a given percentage. Using a very modest criterion — increase or decrease by two or more percentage points on both measures — there were decreases in 15 States and increases in 11. Under a stricter criterion — a change of at least five percentage points on both measures — 13 States decreased in disparity and 10 States increased. These counts would appear to indicate a slight lessening of disparity nationally. This trend would seem to be confirmed by changes in the average of the two measures from 1970 to 1975. The 95:5 ratio averaged over all States changed for 1.72 to 1.67, and the coefficient of variation changed from 16.8 to 16.72. These are simple averages over all

Table 1: Within-State Disparities, 1975
(Ranked by 95:5 Measure)

State	95:5 Percentile 1975 (1)	95:5 Percentile Change* (2)	Coefficient of Variation 1975 (3)	Coefficient of Variation Change* (4)
Georgia	2.41	30	0.28	40
Connecticut	2.29	3	0.21	- 9
Massachusetts	2.17	12	0.23	21
California	2.02	9	0.21	0
Vermont	1.99	-41	0.21	-45
Montana	1.97	3	0.21	11
New Jersey	1.95	1	0.20	0
Illinois	1.90	- 7	0.22	- 4
Tennessee	1.90	- 1	0.21	- 9
Kentucky	1.86	8	0.20	18
New York	1.85	13	0.23	44
Washington	1.83	10	0.18	6
Wyoming	1.82	16	0.21	24
Mississippi	1.80	5	0.17	0
Texas	1.79	- 6	0.20	-13
Arkansas	1.78	- 9	0.18	0
New Hampshire	1.78	- 5	0.16	- 6
Ohio	1.78	0	0.20	5
Virginia	1.78	7	0.27	23
Colorado	1.77	1	0.18	13
Maryland	1.77	11	0.20	43
Missouri	1.73	- 6	0.24	- 4
Nebraska	1.73	6	0.19	27
Arizona	1.71	- 9	0.17	-19
Michigan	1.71	- 5	0.17	-11
Delaware	1.70	-17	0.18	13
Maine	1.67	6	0.16	0
Kansas	1.65	-11	0.14	-36
South Carolina	1.65	- 1	0.14	8
Minnesota	1.62	11	0.15	15
Wisconsin	1.59	- 1	0.16	0
Rhode Island	1.58	-10	0.13	-32
Pennsylvania	1.57	0	0.17	6
North Dakota	1.53	-22	0.14	-18
Idaho	1.51	1	0.16	33
North Carolina	1.51	1	0.12	0
Oklahoma	1.51	-10	0.20	0
Indiana	1.50	- 6	0.13	- 7
Oregon	1.50	0	0.14	17
South Dakota	1.50	-12	0.13	-28
West Virginia	1.49	0	0.13	- 7
Alabama	1.43	0	0.12	0
New Mexico	1.41	- 7	0.13	- 7
Iowa	1.34	-26	0.09	-50
Louisiana	1.32	- 1	0.10	11
Florida	1.30	-15	0.90	-31
Alaska	1.29	- 1	0.16	100
Utah	1.27	0	0.09	0
Nevada	1.18	- 1	0.07	-13
Hawaii	1.00	0	0.00	0

* (1975 - 1970) ÷ 1970

States, and different results are obtained when each State's disparity is weighted by its enrollment. For example, the weighted average coefficient of variation was 17.92 in 1970; this is substantially higher than the unweighted figure of 16.8, indicating that disparities were somewhat greater in the larger States. And the weighted average in 1975 was 18.36, indicating that, nationally, disparity has not decreased.

Thus far, the study has described disparities without addressing the question, How much disparity is too much? One source of guidance is a criterion set by the Office of Education in determining how a State can qualify to be able to count Federal impact aid as State aid.[11] The State must be operating an effective school finance system, when effectiveness is determined by whether or not its 95:5 measure shows a disparity no greater than 25 percent. According to the results in Table I, only two States, Hawaii and Nevada, could meet this requirement in 1975. The Office of Education test excludes from the disparity test the spending made for special needs, while the present study has not separately identified such funds. Moreover, these results are based on approximate measures and on a sample of districts. Nonetheless, it is difficult to believe that more precise measurements would result in more than a handful of additional States qualifying in 1975.

III. The Incidence of Disparities: Gainers and Losers

The analysis in the preceding section portrays the extent to which overall disparities are being reduced. This is of course not the only criterion on which to judge the equity of a particular school finance arrangement. A principal fault found by State courts is that the level of per-pupil resources depends on the ability of localities to raise revenues to support education; we therefore want to examine the incidence of disparities in places that vary in local wealth per pupil. Other issues arise in connection with the cities. Many have argued that redistribution of educational resources to eliminate the effects of property wealth would harm the cities, because these areas generallly have high property wealth.

Disparities and the Ability to Pay

For this analysis each State's student population is divided into the 25 percent in districts with the lowest property valuation per pupil, the 25 percent in districts with the highest property valuation, and the middle 50 percent.[12] For each group the level of expenditures is calculated relative to the State average. In 1970, averaged over all States, children in low-wealth districts received 88 percent of their State average, the middle 50 percent receive 98 percent, and children in high-wealth districts received 114 percent of the average. By 1975, these figures had changed slightly, to 90, 99, and 111 percent, respectively.

A simple index of a State's wealth-related disparity can be calculated by dividing expenditures in the high-wealth quartile of students

by expenditures in the low-wealth quartile. Table II shows the wealth-related expenditure disparity in 1975 and the percentage change over the period. The results can be interpreted by reference to the first entry: New York's high-wealth quartile received 1.59 times the expenditures of its low-wealth quartile; this was an increase of 27 percent in wealth-related disparity relative to 1970. Data for this analysis are not available for Alabama, Alaska, Hawaii, and Louisiana. Results for Montana and Vermont are unduly influenced by the sample of districts and are regarded as not reliable.

The States are listed in order of decreasing wealth-related disparity in 1975. The disparities can be regarded as very severe.[13] In only four States is the wealth advantage less than 10 percent. The average wealth-related disparity (weighted by pupils) in 1970 was 1.33; by 1975 it was 1.30, confirming that there had been some weakening, even if very slight, in the link between expenditures and wealth. It is interesting (and not as obvious as might first appear) that the States with the greatest wealth-related disparity in 1970 generally reduced the disparity in the five-year period; the correlation between disparity in 1970 and reduction in disparity is .58.

Disparities and Urban Status

Administrators in center city school districts have expressed a concern that school finance reform, if aimed at removing the link between expenditures and wealth, may harm the cities, which generally have more than average property wealth per pupil. They argue that not as much of the wealth can actually be applied to education as in other places because

Table II: Wealth-Related Disparities, 1975

State	Wealth-Related Disparity b/	Percent Change
New York	1.59	27
Georgia	1.53	3
Virginia	1.51	3
Maryland	1.50	19
Kentucky	1.49	6
Colorado	1.47	3
Tennessee	1.41	22
Ohio	1.40	- 8
Texas	1.35	- 8
Missouri	1.31	-10
California	1.31	- 6
Pennsylvania	1.31	- 2
Arkansas	1.30	- 7
Nebraska	1.28	7
Kansas	1.27	-11
Oklahoma	1.26	-15
Mississippi	1.26	-12
Michigan	1.26	- 9
Minnesota	1.26	13
West Virginia	1.25	1
Wyoming	1.23	-15
Washington	1.23	- 2
Illinois	1.22	-13
Indiana	1.22	3
Arizona	1.21	-15
Rhode Island	1.21	- 9
New Jersey	1.20	- 8
North Carolina	1.20	17
Massachusetts	1.19	- 6
Oregon	1.19	13
Delaware	1.18	-11
South Dakota	1.18	4
South Carolina	1.17	-10
Florida	1.16	-11
Maine	1.15	- 6
Idaho	1.14	0
New Hampshire	1.14	6
Connecticut	1.13	-22
Wisconsin	1.12	- 6
Utah	1.11	- 2
North Dakota	1.09	-16
Iowa	1.09	8
Nevada	1.05	6
New Mexico	1.03	-21

a/ Data unavailable, incomplete, or unreliable for Alabama, Alaska, Hawaii, Louisiana, Montana, and Vermont.

b/ Disparity is calculated as the expenditure level in the high-wealth quartile divided by the expenditure level in the low-wealth quartile.

cities bear disproportionately higher burdens for other municipal functions. They also argue that a comparison based on expenditure is open to question, because it does not take into account the higher costs of educational resources in the cities. Two questions of interest are examined: How do expenditures in center city districts compare with expenditures in other districts, and what is the apparent wealth in these places?

Table III shows expenditures in 1975, relative to the State average, in center-city districts in Standard Metropolitan Statistical Areas (SMSAs), other districts in SMSAs, and districts not in SMSAs. In 1975, center-city districts spent 8 percent more than their State average, other districts in SMSAs spent at about the State average, and districts not in SMSAs spent about 4 percent less than the State average. The average expenditures in center-city districts might be thought to be affected by States such as Montana that do not contain the large cities normally associated with the problem of urban schooling. If we direct attention to the 27 States that contain at least one of the 100 largest cities, the center cities still spend about 8 percent more than the State average.

It must be recalled here that the resource measure employed is not sensitive to differences between urban and other places in the cost of providing equivalent education services or to the sometimes much greater concentrations of pupils requiring more than average service levels. Thus, a finding that spending in center-city districts is high relative to other places may be of little solace if their costs and needs are even greater. The estimates of change, on the other hand, are much

Table III: Expenditures, 1975, in Districts of Varying Urban Type
(Expenditures Relative to the State Average)

State	Center Cities in SMSAs		Other Districts in SMSAs		Districts Not in SMSAs	
	1975 (1)	Percent Change (2)	1975 (3)	Percent Change (4)	1975 (5)	Percent Change (6)
Alabama	1.02	- 2	1.03	4	0.98	0
Alaska	*		*		1.00	0
Arizona	1.01	-14	0.99	1	0.98	10
Arkansas	1.17	- 5	0.94	2	0.98	1
California	1.04	- 2	0.98	0	*0.98	0
Colorado	1.16	5	0.96	1	0.91	- 7
Connecticut	1.03	2	1.01	- 1	0.94	2
Delaware	1.27	2	1.01	- 2	0.90	5
Florida	0.97	4	1.04	1	0.96	1
Georgia	1.24	1	1.06	2	0.86	- 4
Hawaii	1.00	0	*		*	
Idaho	1.21	9	*0.83	2	0.98	- 1
Illinois	1.15	4	0.98	- 1	0.85	0
Indiana	1.07	- 2	0.95	- 1	0.97	1
Iowa	1.01	-13	0.97	3	1.00	4
Kansas	0.98	8	0.94	- 4	1.03	- 2
Kentucky	*1.14	- 9	1.20	7	0.91	0
Louisiana	1.01	- 5	1.01	3	0.99	2
Maine	0.99	- 3	1.11	- 3	0.99	1
Maryland	0.83	-13	1.08	3	0.90	6
Massachusetts	1.14	15	0.97	- 4	0.90	- 7
Michigan	1.04	- 4	1.02	- 1	0.93	8
Minnesota	1.17	10	0.97	- 4	0.97	0
Mississippi	*1.29	4	*0.93	- 1	0.98	0
Missouri	1.06	10	1.05	- 5	0.91	2
Montana	1.10	15	0.82	-22	0.97	- 4
Nebraska	1.00	- 1	0.90	0	1.02	0
Nevada	0.98	- 7	0.98	3	1.07	- 2
New Hampshire	0.95	0	0.90	- 9	1.02	1
New Jersey	0.94	3	1.01	- 1	1.01	2
New Mexico	0.98	0	*		1.01	0
New York	1.17	13	0.95	- 6	0.79	-11
North Carolia	1.15	0	1.00	9	0.95	- 2
North Dakota	*1.22	- 8	*0.99	- 4	0.98	2
Ohio	1.14	- 1	1.00	- 1	0.86	- 4
Oklahoma	1.09	- 3	0.94	- 7	0.97	- 2
Oregon	1.08	10	0.98	- 2	0.97	- 4
Pennsylvania	1.09	- 6	1.00	1	0.90	1
Rhode Island	1.12	- 4	0.93	3	1.02	3
South Carolina	*1.28	15	0.98	- 4	0.99	1
South Dakota	1.03	- 5	*0.94	-16	1.00	1
Tennessee	1.21	- 2	0.99	-14	0.89	7
Texas	0.99	1	0.98	- 3	1.04	- 4
Utah	1.07	2	0.95	- 1	1.08	3
Vermont	*		*		1.00	0
Virginia	1.10	4	1.11	4	0.85	-10
Washington	1.19	1	0.98	- 3	0.91	5
West Virginia	*1.10	- 8	1.13	- 1	0.95	2
Wisconsin	1.09	8	1.02	- 4	0.93	- 1
Wyoming	*		*		1.00	0

* Less than 10 percent of the State's pupils are in districts of this urban type.

less affected by the lack of sensitivity to these factors. Overall, center cities gained in about half the States and stayed even or lost in the others, other districts in SMSAs lost in more States than they gained in, and districts not in SMSAs generally gained. Of course, it is necessary to view gains and losses from the perspective of status in 1975. The center cities in Ohio, for instance, did not improve their status; but their 1975 expenditures were 14 percent higher than the State average.

The second issue of interest in center-city districts is the extent to which property valuation per pupil may present a misleading estimate of a district's ability to support education. To test this thesis, property valuation was calculated with total population as a base, as an indirect and approximate surrogate of the burden of municipal functions other than education. The use of total population as a base considerably diminishes the apparent wealth advantage of cities. In Ohio, for example, center city districts have 11 percent more property valuation per pupil than the State average, but 13 percent less property valuation per capita. The use in this comparison of total population as a base does not imply that it is preferred to the better known measure of valuation per pupil; it simply demonstrates the sensitivity of results to the measure selected.

IV. The Costs of Further Equalization

The third question addressed here is, What are the costs of further reduction in disparity in the States? The costs depend, of course, on the extent of disparity that is to be tolerated; but the extent of permissible disparity may depend in turn on perceptions of what can be afforded. For these reasons the costs of reducing disparities have been calculated for several levels of disparity. The method is to increase spending in low-spending districts (holding others constant) until a specified value of the 95:5 ratio has been reached.[14] Table IV shows the national costs of reducing disparities in 1970 and 1975 to 1.40, 1.25, and 1.10 for the 95:5 ratio; costs are expressed both as dollars and as percentages of the national budget in each year.

Table IV. National Equalization Costs, 1970 and 1975, at Selected Disparity Ratios

	95:5 Disparity Ratio		
	1.40	1.25	1.10
1970			
Eq. Cost ($M)	1,259	2,894	6,005
% of 1970 Budget	4.4	10.0	20.8
1975			
Eq. Cost ($M)	2,552	5,401	10,401
% of 1975 Budget	5.3	11.1	21.4

Nationally, the costs of leveling up to a disparity ratio of 1.40 in each State would have been $2.55 billion in 1975, and the costs to achieve the Office of Education's disparity test of 1.25 would have been

$5.4 billion. It is noteworthy that, of the $2.55 billion required to decrease disparity in each State to 1.40, approximately 32 percent is accounted for by the nation's two most populous States, California and New York, which together enroll some 16 percent of the nation's elementary and secondary school students.

The costs of equalization have of course increased from 1970 to 1975, the largest part of the increase being attributable to inflation. The more meaningful figures in the table are the equalization costs in each year expressed as a percentage of budget in the year, which in effect cancels the impact of inflation. In all three cases this percentage in 1975 is higher than in 1970, confirming the evidence presented earlier. For the nation as a whole, relatively little change has taken place in overall disparity during this period.

V. Changes in the Reform States

Twenty States have been designated "reform" States as a result of legislative changes in their school finance programs in the early 1970s.[15]. Several forces led to reform, though not all existed in every State or carried equal weight. In several of the States, challenges to existing programs in State courts highlighted disparities among school districts in expenditures for pupils and in tax burdens for residents. These disparities often stemmed from wide variations in local wealth, a major source of revenues for financing publci schools. In some States, legislators became convinced that existing school aid formulas could nto survive judicial scrutiny. Elsewhere, the growing resistance to property taxes led to demands for property tax relief. Finally, reform in some States stemmed from an increased awareness of deficiencies in school aid programs, particularly in a growing concern over the level of financial support for education.

Various mechanisms were used, ranging from modest adjustments in State aid to sweeping reform packages. Some States simply added new dollars to existing programs. Many adopted innovative programs of school aid designed to neutralize wealth differences among districts. The concept of wealth neutrality appeared in the form of guaranteed yields or tax bases school aid programs that allowed a State's basic aid to school districts to vary according to each district's wealth and tax choice. This new aid approach was termed fiscally neutral, for in principle the link between a district's wealth and its school expenditures was removed.

A poor district could achieve any level of expenditure up to the maximum State guarantee with no greater tax effort than many wealthier districts. This type of reform was prevalent in the Midwest -- Illinois, Kansas, Michigan, Ohio, Wisconsin, and Colorado. In Maine and Montana, supplementary aid was provided by means of a guaranteed yield program. The reform in Connecticut consisted of a modest guaranteed yield program, supplementing the basic flat grants available there.

States such as California and Iowa retained their existing aid structures but raised their guaranteed level of State support. Four States — Florida, Indiana, New Mexico, and Utah -- introduced pupil weights in their financial aid formulas, to reflect differences in the cost of providing aid to special student populations, such as the handicapped, and differences in the costs of certain programs, such as vocational education. Many States enacted restrictive revenue or expenditure curbs designed both to limit growth in education expenditures and to reduce disparities among school districts. Florida, Indiana, Iowa, Kansas, Maine, and New Mexico had such provisions in 1975.

The effects of these programmatic and resource changes are summarized in Table V. (New Jersey, although nominally a reform State, is omitted from the table because its reform program was not funded until 1976-77.) Column 1 lists the principal new features adopted by the reform States, as discussed above. Column 2 identifies the reform States in which expenditure disparities among districts decreased by more than two percent on both measures of disparity (based on Table I). Column 3 lists the States that reduced wealth-related disparity by more

than five percent (based on Table II). An entry in Column 4 indicates States in which there is evidence of property relief. Such relief is presumed to have occurred when a State increased its share of State/local revenues and its per-pupil expenditures declined (relative to the national average), from 1970 to 1975. In California, for example, per-pupil expenditures declined from 102.4 percent of the national average in 1970-71 to 95.1 percent in 1975-76, while in the same period the State's share of school revenues rose from 35.2 percent to 40.4 percent. An increase in State support accompanied by a relative decline in school expenditures suggests that some local tax relief occurred. Where the State share and per-pupil expenditures both rose, no presumption of this sort is possible. In these cases, information on tax relief was obtained directly from State officials. An entry in Column 5 indicates that a State's per-pupil expenditures, relative to the national average, increased from 1970 to 1975. An entry in Column 6 indicates that a State increased its share of the State-local burden of education costs.

Of the 19 reform States in the table, 10 reduced interdistrict expenditure disparities between 1970 and 1975. In some States the reduction was impressive. In 1970 only one reform State, Minnesota, had shown an expenditure disparity ratio of 1.50 or less. By 1975, five reform States could be so classified: Florida, Indiana, Iowa, New Mexico, and Utah. But four other reform States were among the ten in the nation with the greatest disparity in 1975: California, Connecticut, Illinois, and Montana.

Table V: Principal Effects and Means of Achieving Reforms, 1970 - 1975

State	Principal New Program Feature (1)	Reduced Exp. Disparities a/ (2)	Reduced Wealth Related Disparity b/ (3)	Property Tax Relief c/ (4)	Increased Education Exp. d/ (5)	Increased State Share e/ (6)
Arizona	Foundation Aid	x	x		x	x (3%)
California	--		x	x		x (5%)
Colorado	Guaranteed Yield			x	x	x (10%)
Connecticut	Add-on Guaranteed Yield		x		x	x (1%)
Florida	Pupil Weight f/	x	x		x	
Illinois	Guaranteed Yield (optional)	x	x	x		x (8%)
Indiana	Pupil Weight f/	x		x		x (8%)
Iowa	-f/	x		x		x (9%)
Kansas	Guaranteed Yield f/	x	x	x	x	x (13%)
Maine	Add-on Guaranteed Yield f/		x	x		x (13%)
Michigan	Guaranteed Yield	x	x	x		x (6%)
Minnesota	--			x		x (10%)
Montana	Add-on Guaranteed Yield				x	x (34%) g/
New Mexico	Pupil Weight f/	x	x			
North Dakota	--	x	x		x	x (23%) g/
Ohio	Guaranteed Yield		x	x		x (8%)
Texas	--	x	x		x	
Utah	Pupil Weight				x	x (3%)
Wisconsin	Guaranteed Yield		x	x	x	x (3%)

a/ Both measures of disparity in Table I decreased by two or more percent.
b/ Wealth-related disparity decreased by five or more percent (Table II).
c/ A State is classified as having provided property tax relief if total per-pupil expenditures (from non-Federal sources) relative to the national average did not increase and if the State's share of expenditures increased between 1970 and 1975. For some States information on property tax relief was obtained directly from State education officials.
d/ State education expenditures relative to the national average increased between 1970 and 1975.
e/ Figures in parentheses refer to increases in percentage share of education revenues from the State, between 1970 and 1975.
f/ Rigid rate or levy ceilings on district expenditures.
g/ County revenues for education are now counted as part of the State contribution in Montana and South Dakota.

In 1970, reform States as a group had larger wealth-related disparities than non-reform States; by 1975, reform States had reversed the situation.[16] Of the 18 States for which data are deemed reliable (excluding Montana), 13 reduced wealth-related disparity by more than five percent and Iowa's wealth-related disparity, although increasing, was still less than 10 percent. Among the reform States, New Mexico came closest to eliminating the gap between wealthy and poor districts; it reduced the wealthy districts' advantage to three percent. The next most successful reform States in this respect were Iowa and North Dakota, where the expenditure advantage in wealthy districts was less than 10 percent in 1975.

Eight reform States made at least some progress on both equalization goals: Arizona, Florida, Illinois, Kansas, Michigan, New Mexico, North Dakota and Texas. Three reform States made no significant progress on either equalization measure: Colorado, Minnesota, and Utah. Three States — California, Colorado, and Ohio — were involved in litigation following the enactment of their reform laws. The California Supreme Court, under a continuation of the landmark Serrano case, rejected that State's reform law in 1976, and new legislation was enacted in 1977. Cases in the other two States are still pending.

Reform provided tax relief for 11 States. The reform laws provided new State money, which was in large part channeled to property tax relief programs. In eight of these States per-pupil expenditures declined relative to the national average, suggesting that property tax relief occurred at the expense of the education program. On the other hand,

all States providing tax relief except Colorado and Minnesota managed to improve on one or both of the equalization measures.

Ten reform States increased their per-pupil expenditures, relative to national average spending, over the five year period. Of these, Arizona, Colorado, Florida, and Kansas showed the largest increases. In 1970, these four States spent well below the national average. Five years later, under revised State programs, they were spending at about the national average or above it. Except for Colorado, these States also managed to register some improvement on the equalization measures. Kansas also provided some property tax relief and was the only reform State to have done so while both increasing its spending level and making some progress in equalization.

Most of the reform States increased the State share of total education revenues.[17] The exceptions are Florida, New Mexico, and Texas. In local Florida and Texas the reform laws were designed to increase reliance on local revenues by increasing the locally required contribution to the basic support program. In New Mexico, districts were permitted to count some Federal revenues toward meeting the locally required contribution; in addition, a uniform local property tax was imposed that further increased available local school revenues. Because these three States made progress toward equalization objectives -- Florida and New Mexico being among the States making the greatest progress -- these remarks might be thought to suggest that unwarranted attention has been given to the role of State share in equalization. In fact, there is a role, but it is not the change in State share as much as the proportion

of the State share. States that assume a high share of total State spending are generally also those with less disparity.[18]

In summary, States traded off among reform goals. Often, significant improvements in equalization were accompanied by decreases in spending (relative to national patterns) and were not accompanied by property tax relief. Tax relief was often obtained at the expense of expenditues for education or improvement in equalization. In other States, increased expenditures for education did not lead to increased equalization. In terms of expenditure disparity, the pattern is mixed, with some improvements and some retrogression; in contrast, wealth-related disparities were generally reduced in the reform States.

The States used a variety of mechanisms, and no one formula can be identified as a preferred or more effective vehicle for reform. Although the presence of rigid rate or levy ceilings appeared to be somewhat associated with reduced educational disparities, it is equally clear that in most States a more important factor contributing to meaningful reform was the commitment of additional resources for education. Without additional funds, any reform other than resource redistribution seems to have been virtually impossible.

We turn now to a discussion of the school finance program in each reform State.

Principal Features of Reform in Each Reform State

Arizona altered its school aid program in 1974 by consolidating its substantial flat grant subsidy with its equalized aid program thereby increasing the portion of State funds distributed through an equalizing foundation aid formula. The annual budget increase for each district is limited to 7 percent of the Statewide average. This provision gives low-spending districts the option of raising their budget for the subsequent year by more dollars than the high-spending districts, which are constrained by the 7 percent Statewide average. However, districts may vote to increase this leeway, which can reduce the equalization aim of the budget ceiling.

Arizona was successful in reducing disparities by channeling a greater share of the basic support program through an equalization formula. Contributing factors were the new expenditure lid as well as the increased funding for the programs. Because substantial amounts of new monies were provided, pupil education expenditures rose from $808 or 94.1 percent of the mean national expenditure in 1970-71 to $1,015 or 101.9 percent of the mean national expnediture in 1975-76. The State share of education revenues increased modestly during the period from 44.6 percent to 47.8 percent. The reform legislation had a pronounced effect on low wealth districts, which experienced a relatively greater growth in expenditures than did the median or high wealth districts.

California. The reform legislation, S.B. 90, failed to improve the State's equalization position and was rejected by the State Supreme Court as inadequate in the second Serrano decision. Equalization aid more than doubled between 1970-71 and 1975-76 in current dollars while the flat grant payment of $125 per pupil remained unchanged. A revenue limit is in effect which curbs the growth in district revenues to a percentage figure set by the State. Despite these features, the program failed to improve equalization for the following reasons: (1) Continued heavy reliance on unequalized local revenues reduces the equalization impact of the State equalization program. (2) The flat grants siphon substantial sums of State money (an estimated $633 million in 1975-76) without changing expenditure disparities in the State. (3) The revenue limit allows the same percentage change in district revenue for all districts, which converts to more dollars in high-spending districts than in low-spending ones. (4) The possibility for unlimited voter overrides reduces the equalization thrust of any revenue limit.

The growth in per pupil expenditures in California did not keep pace with national changes. In 1970-71, California spent $879 per pupil or 102.4 percent of the national average; by 1975-76 per pupil expenditures amounted to $1,320 or 95.1 percent of the national mean. However, the State share of school revenues rose from 35.2 percent to 40.4 percent by 1975-76, which suggests that some property tax relief occurred. When districts are grouped by wealth, the pattern of expenditure changes was remarkably stable for the five-year period, except that high wealth districts lost some ground. This group was probably constrained by the State revenue

limits where overrides were rejected by voters. The reform law did not change perceptively expenditure patterns when districts are grouped by urban type.

Colorado provided substantial new money for education which more than doubled between 1970-71 and 1975-76. However, Colorado's reform program was hampered in part because existing revenue differentials among school districts were frozen into the aid distribution system. The State guarantees a tax base per pupil with the maximum equalized mills guaranteed to yield the authorized revenue base (ARB) for each district. ARB is the revenues raised by a district for the equalization program in the previous year plus any State allowed percentage increase. A substantial flat grant is included in the equalization entitlement program since no district receives less than $10.35 per mill per pupil, regardless of district wealth. A revenue limit allows low-spending districts a greater percentage increase in authorized revenue growth over the previous year than it does for the high-spending districts (112% down to 107%). Despite this cap, the revenue bases of the big spending districts were able to produce enough new dollars enabling them to maintain or even increase the dollar spread in revenues among districts. District voters also have an unlimited override option which can enhance interdistrict disparities. Districts are also unrestricted in the amounts that can be raised outside the equalization program. In Colorado, high and low wealth districts made modest gains in relative expenditures during this period, while medium wealth districts lagged slightly behind: When districts are compared on the basis of urban type, the center city of the State's SMSA (Denver) was the biggest gainer while the rural districts appear to have lost some ground.

The new program failed to reduce expenditure disparities. Nevertheless, average per pupil expenditures increased sharply, rising from $780 or 90.9 percent of the national mean in 1970-71 to $1,422 or 102.4 percent of the national average by 1975-76. At the same time, the State share of revenue grew from 30.3 percent to 39.8 percent. A State official has indicated that substantial property tax relief occurred in low-wealth districts.

Connecticut enacted in 1975 a supplementary program of State equalization aid which guarantees the tax base of the town at the 85th percentile. A town's wealth base is modified by an income factor, namely the town's median family income. In addition, the wealth base is calculated on a per capita rather than on a per pupil basis. In its first year of operation, 1975-76, the program's funding restricted each town to a maximum of 5 percent of its flat grant entitlement of $250 per pupil. As a result, 143 out of the 169 towns received supplemental aid equal to $12.50 per pupil. The funding for the program is provided by an "Instant Lottery" which is scheduled twice a year in the State.

Education expenditures per pupil have grown in the State, regardless of the supplementary equalization program rising from $997 or 116.2 percent of the mean national average in 1970-71 to $1,659 or 119.5 percent of the national mean in 1975-76. State revenues which accounted for 26.3 percent in the earlier year rose slightly to 27.7 percent of the total. Connecticut continues to rely heavily on local resources for its education program.

Florida enacted major changes in its school aid program in 1973, the purpose of which was to guarantee to each pupil educational programs appropriate to his needs and substantially equal to those available to

similar students regardless of geographic location and district wealth. In calculating State aid, pupil weights were introduced for pupils in the regular, special and vocational programs. Locational features were recognized through a cost of living adjustment, a feature which is still unique in State aid programs. District wealth differences were minimized by placing a rigid lid on the amount of leeway dollars that could be raised locally which were limited to 1.707 mills, following a series of changes in the law.

As a result of the additional funds made available for education, Florida's mean expenditures rose from $776 or 90.4 percent of the national average in 1970-71 to $1,381 or 99.4 percent of the national average in 1975-76. Interestingly enough, the State's share of the available revenues including Federal revenues for education fell slightly from 56.0 percent in 1970-71 to an estimated 54.6 percent in 1975-76. Indeed, the data indicate that the (relatively) higher level of funding was due to increased local contributions to the foundation program. In 1971-72 the locally required millage levy was 4.5 mills. Under the new program in 1975-76, this requirement had risen to 6.2931 mills. This increased chargeback required the districts to finance a larger share of the foundation program. Despite this increased local financial contribution, the State provides relatively more funds than the national mean State contribution. The State's improved equalization position probably stems from the local leeway millage rate lid currently in effect.

The growth in expenditures among districts varied inversely with district wealth, which is further evidence of Florida's progress towards equalization. When comparisons are made by urban type, it becomes clear that there were no losers in the State; expenditures grew only slightly faster in the SMSA's cities than elsewhere.

Illinois was one of the first States to enact a guaranteed yield program, known as the Resource Equalizer. However, school districts retained as an option applying for State aid under the existing foundation program. Under the foundation aid option, the guarantee level of $520 was retained. In addition, minimum aid of $60 per elementary pupil and $75 per high school pupils were guaranteed under either aid option. The new formulas provides a variable pupil weighting for Title I eligible pupils. Under the guaranteed yield programs, the State guarantees a tax base of $42,000 for K-12 districts for levies up to 30 mills, a tax base of $64,615 with a rate limit of 19.5 mills for K-8 districts and up to 10.5 mills on a tax base of $120,000 for 9-12 districts. A phase-in feature restricts the growth in State aid to any school district to 25 percent of its prior year aid irrespective of its calculated entitlement. In effect, the State guaranteed a maximum of $1,260 per pupil while average expenditures amounted to $1,452 in 1975-76. This new Resource Equalizer program is more advantageous for most districts, and nearly 900 of over 1,200 districts utilize this approach.

The new Resource Equalizer program managed to reduce expenditure disparities existing in the State between 1970 and 1975. At the same time, a sharp increase in State revenues for education occurred rising from 38.2 percent to 46.2 percent. Substantial property tax relief reportedly occurred in the low-wealth districts under the resource equalizer program. The Title I weighting added substantially to State resources going to Chicago, where between the Fall of 1971 and 1975 current expenditures rose from $1,240 to $1,941 per ADA. The minimum aid guarantee along with Title I weights, and local leeway tax options with no recapture provisions are features which tend to perpetuate expenditure disparities under the Illinois school finance plan.

Between 1970-71 and 1975-76 per pupil expenditures as a percent of mean neational expenditures declined from 109.2 percent to 104.6 percent. In current dollars, the change was from $937 to $1,452.

School resources in low wealth districts grew at a faster pace than they did for medium wealth districts. Highest wealth districts registered the lowest growth. This suggests that the lowest wealth districts benefitted the most from the new State aid program. When districts are compared by urban type, changes in expenditures were fairly consistent throughout.

Indiana adopted a school finnace plan in 1975 which introduced a series of pupil weights for program cost differentials for special and vocational education and a modest weight of .2 for compensatory education. For 1975-76, the foundation aid formula guarantee was set at $690. Average current expenditures were $1,160 in that year and required substantial locally raised revenues. The State sought to lessen reliance on local property taxes

by freezing the local levies to the lesser of a district's normal levy or 30 mills on the 1974-75 adjusted assessed valuation in each district.

With its new law, Indiana succeeded both in reducing somewhat expenditure disparities and providing some property tax relief as evidenced by the growth in the State share of school revenues, estimated at 32.5 percent in 1970-71 and at 40.6 percent in 1975-76. At the same time, average per pupil expenditures lagged further behind mean national expenditures. In 1970-71, these were $770 or 89.7 of the mean national average of $858; by 1975-76, the State mean expenditure of $1,160 amounted to 83.5 percent of the national average of $1,388. It appears likely then that the equalization goals and local property tax relief were achieved in part by restricting the aggregate growth in education expenditures.

The relative change in resources lagged only for medium wealth districts, when the change in resources are compared among school districts. High wealth districts maintained a slight edge. The rigid levy controls may have worked to the disadvantage of medium wealth school districts, whose levies were probably frozen at lower levels than high wealth districts. When districts are classified by urban type, the relative changes in revenues were not pronounced.

Iowa is engaged in a long-term restructuring of the financing of its public schools aimed at achieving State participation equal to 80 percent of the Statewide average cost by 1982. In 1975-76, the State foundation aid guarantee was set at $857 which equalled 73 percent of the State cost per pupil of $1,174. The State foundation guarantee rises each year by one percent of the State average cost as determined by the State comptroller. Each district's allowable annual budget growth is restricted to a percentage

increase specified by the State. (For districts spending below the State average cost, the allowable growth is subject to further limitations.) A minimum State aid level guarantees to each district $200 per pupil.

Iowa improved its equalization position by annually raising its foundation dollar guarantee, thereby enabling those low-spending districts which are poor to both increase their expenditures and to rely more heavily on State resources. A budget lid, equal to 5 percent of the State's average cost per pupil in 1975-76, placed an upper limit on high-spending districts. This lid was restrictive enough to curb the growth in expenditures, for Iowa's per pupil expenditures have declined from 110.0 percent of the mean national average, in 1970-71 to 104.8 percent in 1975-76. The resulting growth in State participation is apparent by figures revealing percentage growth in State revenues for education from 29.2 percent to 38.0 percent between 1970-71 and 1975-76. This relative growth in State revenues, combined with the decline in educational expenditures relative to the national mean, suggests that substantial property relief has occurred.

The relative growth in resources of low wealth districts lagged behind other districts and may be related to a provision in the program that restricts historically low spending districts to a smaller percentage growth in expenditures. Although data are not available to support the conjecture, it is not unreasonable to suggest that many low-wealth districts are also low spenders; to the extent that this is so, the restriction is clearly disequalizing.

Kansas enacted a new school finance program in 1973 in response to the State court ruling in Caldwell v. Kansas declaring the existing program

unconstitutional. The new program guarantees a budget for each district which is based on the district's enrollment size, its current budget and its local tax effort. A budget limit is in effect which limits a district's budget growth to 10 percent of the median budget for its enrollment category. Districts spending below the median may increase their budget as much as 15 percent over the prior year up to the median budget expenditure. As a result, each district has a distinct guaranteed budget level and the State share of this budget varies by district wealth and the local tax effort. Kansas is one of the few States that includes income in calculating local wealth.

Kansas managed to reduce expenditure disparities under this program and assume a greater burden of the cost of education. The State share of school revenues rose from 31.2 percent in 1970-71 to 43.8 percent in 1975-76. This sharp rise in State revenues provided tax relief for low wealth districts. Equally dramatic was the growth in average per pupil expenditures, which rose from $771 to $1,475 during the same period, or from 89.8 percent of the mean national average to 106.2 percent in the later year.

During this period, the changes in resources in the high wealth districts lagged behind all others and may be attributed primarily to the provision limiting district budget growth which is more restrictive for high-spending districts. Expenditures grew most rapidly in SMSA cities when districts were compared by urban type.

Maine enacted legislation which was designed primarily to lessen reliance on local property taxes by increasing the State's share for financing public schools. The law explicitly alters the mix of taxes for

public school support, i.e., local property taxes and State sales and income taxes. In 1971-72, the State was committed to paying one-third of the school costs; under the new law State revenues were to cover 50 percent of the costs in 1975-76. A Statewide property tax was enacted which provided the balance of taxes due. School prperty taxes which were previously retained by the districts were transferred to the State. In turn, the State forwarded to each district its entitlement of $694 for elementary pupils and $1,078 for high school pupils under the 1975-76 guarantee level. Additional allocations were paid to districts in amounts which varied with the sums spent by districts in the 1973-74 base year. The Statewide property tax was abolished by a special referendum in December 1977.

The 2-1/2 mill lid on optional local leeway dollars guaranteed $125 per pupil. In addition, districts spending below the State average are allowed to raise additional local dollars up to the State average.

Maine did not reduce expenditure disparities with its new program. The intricate hold-harmless guarantees undoubtedly helped perpetuate disparities. Also, Maine operates on a reimbursement basis, with State aid based on expenditures two years prior to the date of aid disbursements. Initially, therefore, districts must raise through local taxes any amount eligible for State reimbursements two years later. Initial reliance on local taxes may effectively inhibit districts that are spending below the State guarantees from increasing their educational outlays. Maine is not unique in distributing its aid through reimbursements, and the same difficulty may be encountered by districts in other States that provide aid under similar reimbursement schedules.

By increasing the State share of the cost, less reliance was placed on property taxes, resulting in some property tax relief. At the same time, Maine's average per-pupil expenditures slipped from 88.9 percent of national average, $763 in 1970-71, to 86.2 percent in 1975-76 when they stood at $1,197 and the national mean was $1,388. Meanwhile, the State share of education revenues rose from 31.9 percent to 44.6 percent.

In the five-year period, school resources grew the most in low wealth districts and the least in high wealth districts. Additional equalized State revenues as well as the ceiling on local leeways were probably chiefly responsible for the differential growth patterns.

Michigan turned to a guaranteed yield program in 1973 in response to a State court decision (subsequently reversed) in Milliken v. Green which declared the previous financing system unconstitutional. The new State school aid program provided a two-tiered aid system in 1975-76 which guaranteed $42.40 per mill for 20 mills and $38.25 per mill for an additional 7 mills. This total guarantee is equal to $1,116 in State and local funds for any district levying the full 27 mills. (State average expenditures per pupil were $1,366 in that year). A municipal overburden feature primarily benefits Detroit by providing additional funds for school districts with non-school operating levies 25 percent above the Statewide average.

Michigan's new program reduced expenditure disparities and increased the State share of revenues for education from 45.5 percent in 1970-71 to 51.7 percent in 1975-76. However, local tax leeways and the absence of a recapture of any dollars raised in excess of the guaranteed amount does perpetuate some of the expenditure gap among districts. The guaranteed

yield program indisputedly provided property tax relief to low wealth/high effort districts. Yet the guaranteed dollar amounts were insufficient to entice many local districts to raise local millages in order to qualify for additional State dollars. In 1975-76, out of 529 districts, 394 districts levied less than 27 mills. Between 1970-71 and 1975-76, average State per-pupil expenditures ($937) have slipped from 109.2 percent of the mean national per-pupil expenditure to $1,366, or only 98.4 percent of the national average in 1975-76. The data suggest that Michigan has bought property tax relief at the expense of its education program outlays.

The guaranteed yield program had a somewhat larger impact on the lowest wealth districts, where resources grew the fastest. When districts are compared by urban type, the SMSA center cities fared the least well while rural districts showed distinct gains in school expenditures. The poor performance of the guaranteed yield program in Michigan's cities probably results from a variety of causes including those related to municipal overburden, perhaps to a low demand for education services, and even to the urban wealth bases themselves.

Minnesota was the first State to enact school finance reform legislation in the seventies by raising substantially the foundation support level to an amount approximating the Statewide average per pupil expenditure. The principal purpose of the law was to lessen reliance on property taxes by increasing the State share of education costs. Property tax relief was also provided through a program of homestead credits and other minor State aids to school districts.

A minimum of .5 for each AFDC pupil was added to the district's pupil count. Higher weightings are allowed for districts with high concentrations of AFDC pupils. A hold harmless guarantee is also in effect. In 1975-76, the foundation program guaranteed $900 (a somewhat lesser amount for historically low spending districts) for pupils in grades 1-6 and $1,260 for pupils in grades 7-12.

The new funding program has led to a decrease in school expenditures with average per-pupil expenditures ($1,021 in 1970-71) falling from 118.9 percent of mean national average in 1970-71 to 109.2 percent in 1975-76 when they amounted to $1,516. At the same time, the State accounted for a larger share of education revenues which rose from 44.4 percent to 54.7 percent of the total. Expenditure disparities were not reduced during the period, which may be due as much to the additional weightings provided for AFDC children as to unlimited leeway options for raising revenue and the hold-harmless provision which is in effect.

The high wealth districts were the principal gainers in school resources while the poorest districts gained the least. When districts are compared by urban type, school expenditures grew fastest in SMSA center cities. These data suggest that the center cities are among the high wealth districts, which benefit from State aid provided as a result of the AFDC pupil weights.

Montana altered its school finance program in 1973 at a time when there was a growing concern that the then existing aid formula could not survive close judicial scrutiny. The new law provided that county levies for schools be collected as Statewide taxes, thereby dramatically increasing

the State share of educational revenues from 24.0 percent in 1970-71 to 57.6 percent in 1975-76. Each district is also guaranteed 25 percent of its foundation program amount when districts levy an additional 9 mills in elementary school districts or 6 mills in high school districts.

The new funding formula has led to relatively larger increases in education expenditures. In 1970-71, Montana's per-pupil expenditures ($866) were 100.9 percent of national average; by 1975-76, they amounted to 112.0 percent of mean national expenditures, rising to $1,554.

Expenditure disparities persist, however, and may be due to continued heavy reliance on local taxes. Differences in local wealth bases as well as the possibility of unlimited voter leeway options may also account for the growth in such disparities. School resources grew fastest for low and medium wealth districts while the growth in resources for districts in the wealthiest quartile were substantially below average.

New Jersey. In a landmark decision, Robinson v. Cahill, the New Jersey Supreme Court ruled in 1973 that the State's system of supporting public schools violated the State constitution because "the State has never spelled out the content of the educational opportunity the constitution requires" in meeting the mandate that there be maintained a "thorough and efficient system of free public schools." The Court ordered the State to develop a plan for financing public schools which meets the mandate. Accordingly, a "Public School Education Act of 1975" was enacted which among other provisions spelled out a method of distributing State aid.

Under the new law's provisions, each district is guaranteed a State support ratio which is the lesser of its prior year budget or the State support limit. For each district, the State's support ratio is derived by dividing a district's equalized valuation per pupil by the State's guaranteed valuation and subtracting the quotient from 1.000. The State's guaranteed valuation was set at 1.3 times the State average valuation per pupil for 1976=77. A hold-harmless provision guarantees each district a minimum of 10 percent of the State support limit. Cost factors were introduced which provided additional aid guarantees to special needs pupil populations. In addition, a spending limit was incorporated to prevent districts that received the largest increases in State aid from spending all the new funds on their education program without providing some property tax relief. The expenditure limit varies inversely with district expenditures. An appeals procedure was established which allows districts to seek relief from their expenditure caps.

Implementation of the new law required an increase in State funds of well over $150 million which were not forthcoming until a gross income tax law was passed in July 1976. As a result, the new equalization law was not implemented until the 1976-77 school year. Continued funding of the new program rests upon the renewal of the income tax law, which is due to expire two years after its enactment.

New Mexico in 1973 replaced a school aid program based on instructional units with an aid program based on pupil weights and required a uniform millage levy. Optional local leeway levies are not allowed and 95 percent

of the required millage as well as Federal monies including Impact Aid are counted as the local contribution to the State Equalization Guarantee Distribution.

With this program, New Mexico succeeded in reducing expenditure disparities which was accomplished both as a result of the rigid ceiling on local levies and by counting Federal dollars as part of the required local contribution. Despite the major redistribution of dollars which occurred between 1970-71 and 1975-76, New Mexico did not alter its share of school revenues, which stood at 63.4 percent of total revenues in both years. In addition, State average per-pupil expenditures as a percent of the national average were also remarkably stable going from 90.4 percent in the earlier year to 90.8 percent ($1,261) in 1975-76.

New Mexico's reform program undoubtedly helped most the lowest wealth districts, which experienced the fastest growth in school resources. For high wealth districts the resource growth was slowest.

North Dakota added substantial new money to its foundation support program which guaranteed $640 per pupil in 1975-76. A schedule of pupil weightings for district grade span, sparsity and class size accompany the basic guarantee. County school taxes were henceforth earmarked for the foundation program and a district millage requirement was introduced. In effect, county revenues are now considered part of the State contribution and district taxes are no longer optional but are required in order for a district to qualify for State foundation aid. The district tax requirement led wealthier districts to support a larger share of the foundation program.

The program appears to have been designed primarily to increase financial support for public schools. On that score, the new program was successful in raising average per-pupil expenditures from $689 (80.3 percent of the national mean average in 1971-72) to $1,207 (87.0 percent of the national mean in 1975-76). Some additional equalization has also occurred with the new program. The increased share of State education revenues -- from 25.8 percent in 1970-71 to 48.8 percent in 1975-76 -- reflects the designation of county taxes as State taxes. The new program in North Dakota had by far the greatest impact on low wealth districts which benefitted the most from the higher foundation support levels.

Ohio added a guaranteed yield program to its foundation program and raised the guaranteed foundation level. The State guaranteed a program of $1,380 per ADM in 1975-76 for any district levying 30 equalized mills ($48 per mill for the first 20 mills and $42 for each additional mill up to a maximum of 10 mills). Under its current law, districts must levy a minimum of 20 mills, equalized, whereas no minimum district requirement had previously existed.

Despite the higher guarantee levels, average per-pupil expenditures have remained relatively unchanged as a percent of the national average. In 1970-71, mean per-pupil expenditures in Ohio amounted to $778 or 90.6 percent of the national average; by 1975-76 the State's mean expenditures were $1,264 or 91.1 percent of the national average. The new program has had no discernible impact on equalization in the State. Under the new law, Ohio has raised the State share of education revenues from 28.8 percent in 1970-71 to 36.6 percent in 1975-76. It is likely that the new program provided some property tax

relief with this growth in State revenues. There was no perceptible differences in the growth in school resources for low and medium wealth districts during this period while some lag in resource growth occurred among high wealth districts. Rural districts appear to have experienced a slight edge in the growth in school expenditures while changes among the SMSA districts were indistinguishable.

Texas retained its foundation aid program with significant modifications. A law enacted in 1975 substantially raised the level of foundation support. The wealth measure in calculating the local contribution shifted to assessed property valuations from an index of ability to pay. A uniform requirement of 30 mills was enacted as the local contribution to the foundation program. However, a hold-harmless guarantee provision assures each district a minimum 1.04 percent of State aid received during 1974-75. A new program ($25.4 million) earmarked funds for compensatory education and a supplementary equalization program ($50.0 million) was also enacted.

As a result of these new features, the new Texas program was more equalizing. The share of education revenues derived from the State remained virtually unchanged between 1970-71 and 1975-76, going from 49.3 percent of total revenues to 50.1 percent in the latter year. However, some improvement did occur in average per pupil expenditures, which rose from $636 or 74.1 percent of the national average to $1,094 or 78.8 percent of the national mean during this same period. Resource growth lagged for high wealth districts while expenditures in the SMSA districts outpaced slightly those for rural districts. Within the SMSAs, changes in expenditure growth pattern were barely discernible.

Utah. Starting with one of the lowest expenditure disparities in the nation, Utah maintained this position without registering any appreciable improvements on the disparity measures. The State replaced an aid program based on instructional units with a pupil weighting program. Some modest gains occurred in pupil expenditures which rose from $643, equal to 74.9 percent of national average, to $1,084 or 78.1 percent of the national level in the 1975-1976 school year. By providing additional funds, the share of revenues from State sources were 3 percent higher in the latter year.

Wisconsin's program guarantees a wealth base per pupil, the size of which depends upon each district's grade level, with the guarantee level set at $1,405 per pupil in 1975-76. The guarantee varies for each district, reflecting actual district expenditures. A secondary equalization aid equal to a smaller amount is guaranteed for districts spending above the $1,405 level with the actual amount again depending on district grade span, wealth, and actual spending. In effect, then, Wisconsin operates under a non-linear guaranteed yield program. Recapture provisions which were due to become effective were nullified by the State courts.

Transitional aid is provided to districts too wealthy to share in equalization aid, the actual amount diminishing from year to year. A ceiling on the annual growth in district expenditures equal to 110 percent of the Statewide average is also in effect.

Between 1970-71 and 1975-76, per pupil expenditures rose faster in Wisconsin than for the nation as a whole, rising from $977 or 113.9 percent of the national average in 1970-71 to $1,618 or 116.6 percent

of the national average. At the same time, the State share of school revenues rose modestly from 29.3 percent to 32.1 percent of the total. The pattern of expenditure disparities persists, however, and may be due as much to the modified hold harmless provision as well as to provision allowing generous district expenditure growth. The heavy reliance on local revenues may also be contributing to interdistrict expenditure disparities. Substantial property tax relief has been reported to have occurred.

Medium wealth districts showed the greatest gain in resources while high wealth districts were slowed. The expenditure limit was probably responsible for this differential growth. Expenditures grew fastest in SMSA center cities, while the lag appeared greatest in other SMSA districts. It is likely then that many of these latter districts are among the high wealth districts being affected by the expenditure limits.

VI. Summary and Conclusions

This study has attempted to place changes brought about by the school finance reform movement in the context of changes in the nation as a whole between 1970 and 1975. Nationally, overall expenditure disparities, which were severe in 1970, have not decreased and, if anything, have increased. In neither 1970 nor 1975 were there more than a handful of States that could have qualified for a disparity test promulgated by the Office of Education. Much of the disparity is due to the influence of local wealth, which varies greatly within the States. Wealth-related disparities have apparently decreased slightly between 1970 and 1975.

In the States considered here as reform States by virtue of changes in their school finance programs made between 1970 and 1975, overall expenditure disparities appear to have been reduced slightly, while more substantial progress was made in reducing disparities due to local wealth. Although reduction in overall disparity and in wealth-related disparity are commonly thought of as primary goals of school finance reform, other forces were operating. Failures to make significant progress toward equalization goals may be linked not only to inertia but also to a desire to provide relief of property tax burdens.

Disappointing as these results are to those who have looked to the reform movement as a means for achieving equalization, they must be placed in the perspective of the non-reform States. In 1970, the States that were to reform in the coming years were the most in need of reform: both in terms of expenditure disparities and wealth-related

disparities, they were much less equalized than the other States. By 1975, the reform States had improved at least slightly on both counts, and the non-reform States worsened. The reform States have therefore been swimming against a tide of increasing disparity.

The fear that center city school districts may be harmed by school finance reform seems not to be justified by changes between 1970 and 1975. Such districts generally held their own in the reform States. Whether or not this would continue to be true if a State implemented significant reform is moot.

The costs of further equalization depend on the extent of disparity that is to be tolerated. Too loose a criterion might violate principles of equal educational opportunity; a very strict criterion could call for funds that might not, in practice, become available. The costs of reducing expenditure disparities to meet the Office of Education test would have been $5.4 billion in 1975.* This is a substantial amount; but the amounts in the future may become greater — not only because of inflation but also because, unless checked by effective reform, disparities may continue to increase in America's schools.

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* This estimate is obtained by holding high-spending districts at existing levels and increasing spending in other districts until the specifiied equalization level is achieved. Another method could be used that might have been regarded as politically infeasible until the recent increase in resistance to local property taxes highlighted by recent tax reductions in California. Local spending may be limited at less than existing levels, and State aid could be targeted strongly to low-spending districts. The effect would be to achieve a given level of equalization at much lower costs than are estimated here.

NOTES

[1] The COE reported for each school district is multiplied by the ratio of (1) local and State revenues plus impact aid to (2) total revenues.

[2] The treatment of Federal impact aid, or SAFA, as local revenue is based on the rationale that these funds are intended to offset the loss in local revenues occasioned by the tax-exempt status of Federal property, an approach that is consistent with the fact that the funds are for general support rather than for Federally defined programs.

[3] This problem has been the subject of several recent investigations. For studies of cost of education indexes in individual States, see Selected Papers in School Finance, 1974 and 1975 editions (Office of Education). Alternative Cost-of-Education Indices (Killalea Associates, October 1977, prepared for the National Institute of Education) assesses a number of index formulations, including two described in A Cost-of-Education Index: Methodological Considerations (Killalea Associates, prepared for the National Center for Education Statistics, October 1977).

[4] The choice of pupil counting method can make a difference, as has been pointed out by a number of analysts. In particular, places with high absentee rates would generally suffer in the allocation of State funds if the State used average daily attendance.

[5] Some State school finance systems employ pupil weightings that are intended to reflect the variation in needs of different pupil groups. The effect of such weightings is to alter the relative number of "pupil units" among a State's districts. The data needed to convert the reported number of pupils into adjusted pupil units are not available for this study.

[6] The data bases for the two years are composite collections from several sources. School data are from the ELSEGIS (Elementary and Secondary Education General Information System) data bases collected by the National Center for Education Statistics for school years 1969-70 and 1974-75. Data from the 1970 Census was added to the files for both years. Property valuation as of 1970 was added to the 1969-70 files; property valuation as of 1973-74 was added to the 1974-75 files. The samples are approximately 4,550 for 1969-70 and 5,800 for 1974-75.

[7] The coefficient of deviation is the average deviation expressed as a percent of the mean. The coefficient of variation is the standard deviation as a percent of the mean. The Gini index is most easily understood in terms of a graph of the percentage of funds received by x percent of the students, versus x. For a perfectly

even distribution, the plot is a straight line. For other distributions, it is a curve underneath the straight line. The Gini Index is the fraction of the total area under the line that lies between the line and the curve; the higher the value, the more uneven the distribution.

[8] The 95:5 measure is subject to several criticisms. In analyzing within-State disparities, it seems appropriate to disregard highly unusual circumstances that may justify high expenditures, such as the ranch school districts in certain States. When applied to all States, however, it assumes that unusual circumstances arise uniformly in all States, which is not the case. Moreover, there is considerably less justification for excepting the lowest-spending districts than for excepting the highest-spending districts.

[9] See Measures of Disparity: A Note, Richard A. Rosthal, Killalea Associates, Incorporated, February 1978.

[10] This kind of result might be thought to support the view that States operating many districts could improve their equity status through district consolidation. Whether or not their status would improve depends on the measure of equity, as has often been pointed out (see, for example, Inequality in California School Finance, Rand Corporation, March 1975). Moreover, it could raise new questions about the unit-of-observation; for very large districts, equity considerations might involve intradistrict disparities, whcih are not analyzed here.

[11] The requirement is specified in 45 CRF 115.63. States have also set their own requirements. The California Supreme Court has required that, after a period of years of phased-in reform, that State's system should exhibit a disparity no greater than $100 per pupil from place to place. California's expenditures (as defined in this study) average $1,095 in 1975, and accordingly the court criterion is even more limiting than that set by the Office of Education.

[12] Students are grouped into quartiles according to their district's property valuation per pupil: the fourth of a State's students that are in districts with the lowest valuation per pupil, the fourth that are in the districts with the highest, and the two middle quartiles (combined into one group for ease of presentation). As can be expected, some districts (particularly very large ones) have students in two quartiles; in such cases, a district's students are all "tagged" with the same per pupil property valuation and then distributed across the quartiles; they are also tagged with the district-wide average expenditures per pupil. It is then possible to compute the (pupil-weighted) average expenditures in the quartiles. The expenditures in the quartiles are then expressed as a percentage of State average expenditures.

[13] Values of the wealth-related disparity ratio can be expected to be lower than those of the 95:5 disparity ratio, because the latter assesses disparity across 90 percent of the students. If a 95:5 ratio were calculated for students ordered by local wealth, its values would be much higher than those presented in Table II (but would still be lower than the values of the 95:5 ratio of overall disparity).

[14] The method used here to calculate equalization costs differs from that employed by the President's Commission on School Finance. (See Review of Existing State School Finance Programs, Volume II.) In selecting the districts to be leveled up, they excluded the five percent of each State's children who were in the lowest-spending districts, thus leaving these children exactly where they were before equalization. Whatever justification there may be for excepting the bottom five percent from a disparity test (and we have argued in note 8 above that the justification may be weak), there appears to be no rationale that would exclude them from the benefits of equalization.

[15] See National Conference of State Legislatures, School Finance Reform: Legislator's Handbook; and Education Commission of the States, School Finance Reform in the States, 1976-77.

[16] Wealth-related disparity, pupil weighted, for the reform States was 1.36 in 1970 and 1.26 in 1975. For the non-reform States, that disparity was 1.29 in 1970 and 1.36 in 1975.

[17] State aid as a proportion of total State-local fluctuates in many States from year to year. A comparison based on only two points, five years apart, could therefore be reversed the following year.

[18] The correlation between change in State aid and change in disparity is only -.18. The correlation between State share in 1975 and level of disparity in 1975 is -.45.

Table A-1: Within-State Disparities for Four Equalization Measures, 1970

State	95:5 Percentile (1)	Coefficient of Deviation (2)	Coefficient of Variation (3)	Gini Index (4)
Alabama	1.43	0.09	0.12	0.07
Alaska	1.30	0.05	0.08	0.04
Arizona	1.88	0.17	0.21	0.12
Arkansas	1.96	0.14	0.18	0.10
California	1.86	0.15	0.21	0.11
Colorado	1.76	0.13	0.16	0.09
Connecticut	2.22	0.18	0.23	0.12
Delaware	2.06	0.12	0.16	0.09
Florida	1.53	0.11	0.13	0.07
Georgia	1.86	0.15	0.20	0.10
Hawaii	1.00	0.00	0.00	0.00
Idaho	1.49	0.09	0.12	0.07
Illinois	2.05	0.18	0.23	0.12
Indiana	1.59	0.11	0.14	0.08
Iowa	1.82	0.13	0.18	0.09
Kansas	1.86	0.13	0.22	0.10
Kentucky	1.72	0.15	0.17	0.10
Louisiana	1.33	0.08	0.09	0.05
Maine	1.57	0.12	0.16	0.09
Maryland	1.60	0.10	0.14	0.07
Massachusetts	1.94	0.15	0.19	0.10
Michigan	1.81	0.14	0.19	0.10
Minnesota	1.46	0.10	0.13	0.07
Mississippi	1.71	0.14	0.17	0.09
Missouri	1.84	0.16	0.25	0.11
Montana	1.91	0.16	0.19	0.11
Nebraska	1.63	0.09	0.15	0.07
Nevada	1.19	0.06	0.08	0.03
New Hampshire	1.88	0.12	0.17	0.09
New Jersey	1.93	0.15	0.20	0.11
New Mexico	1.51	0.09	0.14	0.07
New York	1.64	0.13	0.16	0.09
North Carolina	1.49	0.90	0.12	0.07
North Dakota	1.95	0.13	0.17	0.09
Ohio	1.78	0.16	0.19	0.11
Oklahoma	1.67	0.15	0.20	0.11
Oregon	1.50	0.09	0.12	0.06
Pennsylvania	1.57	0.13	0.16	0.09
Rhode Island	1.75	0.15	0.19	0.10
South Carolina	1.66	0.11	0.13	0.08
South Dakota	1.71	0.11	0.18	0.08
Tennessee	1.91	0.21	0.23	0.13
Texas	1.91	0.15	0.23	0.11
Utah	1.27	0.06	0.09	0.04
Vermont	3.36	0.26	0.38	0.19
Virginia	1.66	0.17	0.22	0.11
Washington	1.66	0.14	0.17	0.10
West Virginia	1.49	0.11	0.14	0.08
Wisconsin	1.60	0.11	0.16	0.08
Wyoming	1.57	0.13	0.17	0.09

Table A-2: Within-State Disparities for Four Equalization Measures, 1975

State	95:5 Percentile (1)	Coefficient of Deviation (2)	Coefficient of Variation (3)	Gini Index (4)
Alabama	1.43	0.10	0.12	0.07
Alaska	1.29	0.11	0.16	0.07
Arizona	1.71	0.13	0.17	0.09
Arkansas	1.78	0.14	0.18	0.10
California	2.02	0.15	0.21	0.11
Colorado	1.77	0.13	0.18	0.10
Connecticut	2.29	0.16	0.21	0.12
Delaware	1.70	0.14	0.18	0.09
Florida	1.30	0.07	0.09	0.05
Georgia	2.41	0.21	0.28	0.15
Hawaii	1.00	0.00	0.00	0.00
Idaho	1.51	0.13	0.16	0.09
Illinois	1.90	0.18	0.22	0.12
Indiana	1.50	0.11	0.13	0.07
Iowa	1.34	0.07	0.09	0.05
Kansas	1.65	0.09	0.14	0.07
Kentucky	1.86	0.17	0.20	0.11
Louisiana	1.32	0.08	0.10	0.05
Maine	1.67	0.13	0.16	0.09
Maryland	1.77	0.15	0.20	0.10
Massachusetts	2.17	0.17	0.23	0.12
Michigan	1.71	0.12	0.17	0.09
Minnesota	1.62	0.11	0.15	0.08
Mississippi	1.80	0.14	0.17	0.09
Missouri	1.73	0.16	0.24	0.11
Montana	1.97	0.15	0.21	0.11
Nebraska	1.73	0.12	0.19	0.09
Nevada	1.18	0.04	0.07	0.03
New Hampshire	1.78	0.12	0.16	0.09
New Jersey	1.95	0.16	0.20	0.11
New Mexico	1.41	0.08	0.13	0.06
New York	1.85	0.20	0.23	0.13
North Carolina	1.51	0.09	0.12	0.07
North Dakota	1.53	0.11	0.14	0.08
Ohio	1.78	0.16	0.20	0.11
Oklahoma	1.51	0.13	0.20	0.09
Oregon	1.50	1.11	0.14	0.08
Pennsylvania	1.57	0.14	0.17	0.09
Rhode Island	1.58	0.11	0.13	0.08
South Carolina	1.65	0.10	0.14	0.08
South Dakota	1.50	0.09	0.13	0.07
Tennessee	1.90	0.18	0.21	0.12
Texas	1.79	0.14	0.20	0.10
Utah	1.27	0.07	0.09	0.04
Vermont	1.99	0.18	0.21	0.12
Virginia	1.78	0.21	0.27	0.14
Washinton	1.83	0.14	0.18	0.10
West Virginia	1.49	0.10	0.13	0.07
Wisconsin	1.59	0.12	0.16	0.09
Wyoming	1.82	0.15	0.21	0.10

APPENDIX B*

Resource Levels in Non-Unified Districts

In States that operate non-unified school districts, per-pupil expenditures are generally lower in elementary districts than in secondary districts. The differences is generally considered justified by the need for advanced courses or smaller classes in high schools. An analysis that takes no account of these justifiable spending differences can over- or underestimate the extent of disparity or the incidence of disparity in districts of varying wealth. If an elementary district spends $400 per pupil (and is low in local wealth) and a secondary district spends $1,600 per pupil (and is high in local wealth) the calculated disparity of 4.00 is greater by some amount than the "true" disparity. On the other hand, a high-wealth elementary district may spend $1,200 per pupil, while a low-wealth secondary district may spend only $1,000; the calculated disparity of 1.20 understates the real disparity. And, of course, in neither instance are the expenditures in non-unified districts really comparable with those in unified districts.

The obviously correct resolution is to associate each elementary district with the secondary district to which it sends its students after the last year of elementary schooling. Then, under the reasonable assumption that parents would not discriminate against their younger children in favor of their older children, the total expenditure in the two districts divided by the total number of children in both districts produces a figure that can validly be compared with the resource level in unified districts. (This approach should also be extended to estimate the local wealth backing the children in the two kinds of districts. This extension is complicated by the fact that most secondary districts draw from several elementary districts, and the elementary districts may vary widely in their property wealth.) Unfortunately, the data required for the association of districts are not available.

An alternative approach that could be satisfactory for a study of this kind is to adjust the expenditures as reported for non-unified districts -- upward for elementary and downward for secondary. There is no agreed standard for such an adjustment factor, but we can inspect the decisions made by a number of States that have explicitly addressed this matter in their school finance programs. Table B-1 lists the weightings in 11 States that either operate non-unified districts or that use pupil weightings in the district allocations. Most of the States give extra weightings for secondary pupils, ranging from 8 percent to

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* This appendix was prepared by J. Neil Killalea and Richard A. Rosthal.

36 percent more than for elementary grades. The best-known exception is Florida; legislators in this State recently determined that the tender years were more important for education that many have believed in the past, and accordingly have given greater weight to elementary grades. Even this is not a clear direction, since Florida's weighting of 0.97 for secondary versus 1.0 for elementary is calculated without taking into account the vocational education program that Florida operates.

Based on the weightings in Table B-1, 20 percent appears to be a reasonably acceptable figure for use in an adjustment. Two sets of computations were made for comparison purposes. One set made no adjustment at all. In another set, an adjustment was made as follows. It was assumed that secondary districts were justifiably alloted 20 percent more than elementary districts, per pupil served. In order

Table B-1. Elementary-Secondary Expenditure Weightings, Selected States a/

Delaware	1.184
Florida	0.974 b/
Illinois	1.250
Kentucky	1.125
Louisiana	1.080
Minnesota	1.286
New Mexico	1.240
New York	1.184
North Dakota	1.247
Oregon	1.300
Pennsylvania	1.360

a/ Calculated from data on school finance program in each State, as described in Public School Finance Programs, Office of Education, 1976.

b/ Calculated as in a; but the calculation does not include expenditures for vocational education programs.

to have both types of non-unified districts comparable with unified districts, it is necessary to adjust both elementary and secondary districts. According to the Digest of Education Statistics, 1975, approximately 71 percent of the total student population is in elementary grades. Taking these factors into account, the adjustment was implemented by multiplying expenditures of elementary districts by 1.058 and expenditures of secondary districts by 0.882.

Table B-2 shows the computed 95:5 disparity measure for 1970, with and without the adjustment. There is surprisingly little difference between the two sets of calculations. In 39 States, the two results are identical; some but not all of these operate only unified districts. Only in three States -- Illinois, Massachusetts, and Montana -- do the two results differ substantially. In Montana, the difference is particiularly striking: 1.59 with the adjustment and 1.91 without.

We conclude that for the purposes of the present study it is not necessary to adjust for different spending levels of non-unified districts. The matter is, however, an important one at the State level. It is obviously necessary to make such adjustments both to derive an appropriate allocation of State aid and to permit more precise measurements of disparity.

Table B-2: Disparities (by 95:5 Measure) in 1970, With and Without Adjustment for Elementary and Secondary Spending Differences

State	Adjusted	Not Adjusted
Alabama	1.43	1.43
Alaska	1.30	1.30
Arizona	1.89	1.88
Arkansas	1.96	1.96
California	1.84	1.86
Colorado	1.76	1.76
Connecticut	2.20	2.21
Delaware	2.06	2.06
Florida	1.53	1.53
Georgia	1.86	1.86
Hawaii	1.00	1.00
Idaho	1.49	1.49
Illinois	1.91	2.05
Indiana	1.59	1.59
Iowa	1.82	1.82
Kansas	1.86	1.86
Kentucky	1.72	1.72
Louisiana	1.33	1.33
Maine	1.57	1.57
Maryland	1.60	1.60
Massachusetts	1.74	1.94
Michigan	1.81	1.81
Minnesota	1.46	1.46
Mississippi	1.71	1.71
Missouri	1.84	1.84
Montana	1.59	1.91
Nebraska	1.63	1.63
Nevada	1.19	1.19
New Hampshire	1.89	1.88
New Jersey	1.89	1.93
New Mexico	1.51	1.51
New York	1.63	1.64
North Carolina	1.49	1.49
North Dakota	1.95	1.95
Ohio	1.78	1.78
Oklahoma	1.67	1.67
Oregon	1.48	1.50
Pennsylvania	1.57	1.57
Rhode Island	1.75	1.75
South Carolina	1.66	1.66
South Dakota	1.71	1.71
Tennessee	1.91	1.91
Texas	1.91	1.91
Utah	1.27	1.27
Vermont	3.30	3.36
Virginia	1.66	1.66
Washington	1.66	1.66
West Virginia	1.49	1.49
Wisconsin	1.60	1.60
Wyoming	1.57	1.57

IMPACT OF THE 1973 WISCONSIN SCHOOL FINANCE REFORM*

I. INTRODUCTION

The purpose of this study is to evaluate the effects of the Wisconsin 1973 school finance reform and associated legislation three years after its passage by the State Legislature. We want to assess the extent to which the legislation was successful and, in particular, whether the legislation led to any narrowing of disparities in expenditures among local school districts.

The major changes brought about by the 1973 legislation can be summarized as follows:

1. It instituted substantial property tax relief by increasing the State's overall share of funding from 30 to 40 percent. The imposition of "cost controls" which limited the annual expenditure increases of local districts helped to assure the provision of property tax relief.

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2. It virtually eliminated rather than merely minimized the influence of a district's property tax base on educational spending. This was done by replacing the guaranteed minimum tax base with a standard tax base for each pupil that substantially exceeded the state average equalized valuation.

3. It required districts with property valuations higher than the standard tax base to make payments back to the state ("negative aids"), thereby reducing the incentive for high property wealth districts to spend large sums on their schools. This provision was subsequently struck down by the State Supreme Court.

4. It mandated certain minimum educational standards rather than providing incentives for districts to achieve these standards.

5. Except for cost controls and the minimum educational standards, local control over tax and expenditure decisions was largely maintained once tax bases were equalized.

The Wisconsin legislation is interesting for various reasons. Most important, the 1973 reforms reflect the continuing evolution of a comprehensive program of state aid begun almost twenty-five years earlier. That original legislation in 1949 broke new ground by clearly spelling out the state's goals: (a) it indicated that education and its financing was a state responsibility; (b) it required that the state guarantee the basic educational opportunities of young people through local school districts which would provide programs meeting certain quality standards and that the state encourage districts to meet higher quality standards; and (c) it required the state to provide relief from property taxes where such taxes were

excessive by shifting a greater proportion of total school costs to other state revenue sources.

Also interesting is the legislation's sharply focused effort to respond to the Serrano decision in California and the lower court decision on Rodriguez by moving to full power equalization. These decisions said in essence that the property wealth of a school district should not influence the quality of educational offerings. And even though the Serrano principle was not upheld by the Supreme Court in its decision on Rodriguez, these two cases generated growing public awareness and concern about inequities in Wisconsin's school finance program.

During this same period another quite different force emerged in the form of the so-called property tax "revolt." Sharp increases in property taxes, fueled by accelerating increases in local government expenditures (including school expenditures) and by inflation-induced increases in property assessment, generated widespread taxpayer complaints. These brought calls for stronger efforts to curb local spending and to increase state-provided property tax relief.

Finally, school finance in Wisconsin remains part of a complicated mosaic of state-local fiscal relationships in which approximately two-thirds of state revenue is returned to local communities, through categorical grants, general and personal property tax relief, and general revenue-sharing, and they decide how to spend these funds. Major changes in the size and manner of distributing aids and tax relief have occurred throughout the 1970s. Thus, in a period when state-local fiscal relationships were being recast, school finance

reform was viewed as part of a larger program of statewide fiscal reform.[1]

The question of how to evaluate the school finance legislation raises a number of issues. The controversial "negative aids" program was to be phased in over a ten-year period through a complicated set of transitional rules. At the onset of this study we viewed our evaluation as no more than an interim evaluation. A complete evaluation could not occur until after 1983 when the transition would be complete. By that time, other modifications might have precluded a clear-cut evaluation of the 1973 reforms. In the meantime, the controversial nature of "negative aids" led to a court test of its constitutionality, and a Wisconsin Supreme Court decision in December 1976 held that negative aids were unconstitutional. This decision eliminated a key feature of the reform legislation and altered the impact of the 1973 legislation. Because the Court decision modified the effect of the transition rules, the implementation of the reform can be viewed as virtually complete, since the other minor transitional apsects of the legislation had almost worked themselves out by 1975-76.

As we shall see, however, other elements of the reform legislation have worked against its goals. We refer to the set of spending limitations which restrict annual increases in the school budgets. These cost controls imposed each year limit the attainment of two major objectives--greater equalization and improved quality of

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[1]This last consideration increases the complexity of any attempt to evaluate the school finance reform legislation. We have made a limited effort in this report to touch on this issue, recognizing that much additional work remains to be done.

education through implementation of minimum standards. The point to recognize is that the reform and associated legislation, in attempting to achieve multiple goals, inevitably led to conflicting provisions that left the outcome of the legislation in considerable doubt. But this is getting ahead of the story.

Our study is divided into several parts. Part II begins with a description of the law, and Part III compares its provisions with those found in the earlier legislation. Part IV discusses the reform in the context of Wisconsin's state-local fiscal environment. Part V reviews the politics of its legislative enactment. Part VI describes how the impact of the various parts of the legislation will be measured. Parts VII, VIII, and IX present our findings. Part X provides a short summary and our conclusions.

II. DESCRIPTION OF THE REFORM LEGISLATION

This section describes Wisconsin's 1973 school finance reform law and its associated legislation.[2] After a brief description of the objectives of the law, we present a detailed examination of the current law's provisions. We then compare the old and the new laws, with emphasis on the origin of the reform provisions, similarities in the laws, and the unique aspects of Wisconsin school finance. Several subsequent changes in the 1973 law are woven into the discussion.

Objectives of the 1973 School Finance Reform

The school finance reform law had several major objectives, not all of which are made explicit in the law's statement of purposes.

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[2] We refer to Chapter 121, School Finance, Wisconsin Statutes, 1973; Chapter 90, Section 550, Laws of Wisconsin, 1973; and also Chapter 121, Wisconsin Statutes, 1975, and Chapter 39, Sections 608-610, Laws of Wisconsin, 1975.

The first objective was to provide relief from the local general property tax as a source of school revenue where such tax is excessive and to tap other sources of state revenue to pay a greater proportion of the costs of education. Implicit is the objective of reducing differences in school expenditures among school districts by giving greater relief to high tax districts.

A second objective was to bring about greater equality in school spending. This was accomplished in two ways. One was through power equalization which guarantees a standard tax base for all districts. This would neutralize property wealth differences on the capacity of districts to raise funds in support of their schools. The other was to discourage higher spending districts from their high spending levels by requiring these districts to pay negative aids to the state. In effect, the state's costs of equalizing school expenditures go down by forcing a portion of these costs onto high spending-high wealth districts.

The third objective was to guarantee basic educational opportunity to all students. School districts must offer programs meeting certain minimum standards as a condition of state funding. Incentives to bring about consolidation into K-12 districts continued. Greater equalization of funding is not sufficient for increasing educational opportunities, though presumably it facilitates greater uniformity in the quality of education.

A fourth objective was to limit the rate of annual increases in state-provided school aid payments by cost controls.

It seems obvious that objectives one and two go together in two important ways. First, they attempt to promote greater equality

of educational expenditures by guaranteeing a higher level of spending and also reducing the incentives leading toward high spending. Second, they attempt to economize on the state's resources by diverting resources from high spending local districts to aid in equalizing school expenditures. But these redistribution goals conflict with the goal of providing general property tax relief since property tax relief can hardly be uniform (or "general") if there is an attempted redistribution. The first two goals may conflict with the third goal, depending on how more spending translates itself into educational quality across school districts; more money does not necessarily increase quality. Moreover, the fourth objective circumscribes the equalization goals by limiting the possibility of larger expenditure increases for low spending districts. Equally important, objectives two, three, and four conflict with a fifth goal that emerged in the legislative process--namely, maintenance of local autonomy and control.

The extent to which these objectives are in conflict will become more apparent as we describe the provisions of the legislation and subsequently examine its effects.

Major Provisions of the 1973 Reform

The provisions of the reform package, shown in Figure 1, can be grouped as follows: (1) state minimum standards of educational quality; (2) definition of costs the state agrees to share with local governments; (3) controls on cost increases; (4) determination of the amount of aid provided by the state; and (5) transition provisions for phasing in the operation of the new law.

FIGURE 1

THE MAJOR PROVISIONS OF SCHOOL FINANCE LAW

Total school costs are affected by the need to comply with the

13 Minimum Standards of Education Quality

Those costs which the state agrees to share are defined as

Total Shared Costs

However, the level of and increases in total shared costs are restricted by

Cost Controls

The way in which state aid is calculated is determined by using the

Primary and Secondary Shared Aid Formulas

The actual aid payments during the first ten years of the law are determined by the

Transitional Aid Program

The linkages among these provisions can be briefly described as follows: the first, minimum standards, outlines the kinds of educational activities which the state views as appropriate and which help to set the level of per pupil costs. But since not all costs are deemed suitable for sharing by the state, this requires indicating which costs do and do not qualify for shared aid. Whatever the level of costs, cost controls restrict the rate of increase in costs to be shared. Once the allowable shared costs and changes in them have been established, the formulas for calculating state aid must be used. The actual amount of state aid provided is affected by the transition provisions written into the law.

School District Standards. The 13 minimum standards imposed on school districts embarce a number of considerations. Three deal with the qualifications, pay, and inservice training of teachers (a, b, c). Another seven mandate the total amount of instruction as well as certain types of instruction and academic services (d, e, f, g, h, j, l). Two concern safety of the facilities and provision of health services (i, k). And the last (m) requires certain minimum tax levies for unconsolidated districts. After July 1, 1973, school districts were to be in compliance with one-third of these standards; all districts were to be in compliance with two-thirds of these standards by July 1, 1974; and districts were to be in compliance with all of these standards after July 1, 1975.

Definition of Costs. Central to any program of state aid is the definition of school costs and the method for calculating these costs. Shared costs are defined as those school district costs the

state is willing to share.[3] These costs include school district net operating costs, teacher benefits, and up to $100 per pupil of non-operating costs, namely, debt service and capital outlay levies. Non-shared costs are those paid by local school districts and are composed primarily of construction expenditures; since the costs of financing these expenditures are reflected by debt service and capital outlay levies, this means that a major portion of construction costs is financed by shared costs.

Shared costs are divided into two parts. Primary shared costs constitute that portion of shared costs per pupil which are less than 110 percent of the previous year's statewide average per pupil shared cost. The portion of costs above the 110 percent level is designated as secondary shared costs. The purpose of the distinction is to cause the state to pay a smaller proportion of secondary shared costs; this serves to weaken the incentive for districts with high per pupil expenditures to continue high spending levels.

Cost Controls. Cost controls set an upper limit on annual increases in per pupil shared costs. Debt service and capital outlay costs are excluded from the shared cost budget as defined above in applying cost controls. The allowable increase is set each year by the legislature, with the intent of restraining large increases in spending by local school districts. The cost control limit may be exceeded by passage of a local referendum authorizing increases in excess of the limit. In addition, the state superintendent of public

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[3] "Aidable costs" or "aidable expenditures" are perhaps more descriptive terms. We will continue to use shared cost as it is written in the law.

instruction is allowed discretionary power to grant certain exemptions to the limitation.

In 1973, the first year, the limit was $55 per pupil, and 197 out of 436 districts were allowed to exceed this limit. The exceptions totaled $7 million. In 1974-75 there were no limits and therefore no exceptions. In 1975-76 the controls limited cost increases to 9.5 percent of the prior year's shared cost budget. For the same year the legislature also authorized specific exemptions to apply under the following conditions: (1) if controls prevented implementation of new programs for handicapped children,[4] (2) if controls prevented utilization of new construction and capital improvement, and (3) if controls prevented implementation of a comprehensive plan for the elimination of racial imbalance by a specific date.[5] It is worth noting that the restriction of primary shared costs to 110 percent of the prior year's statewide average also acts as a cost control device.

Determination of State Aid Payments. The state provides aid to local school districts through a formula that differs for primary and secondary shared costs.

The Primary State Aid Formula indicates how the state determines its funding of primary shared costs. There are several elements to the formula, among them: Primary State Guaranteed Valuation (PSGV) which is the equalized property value established by the legislature

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[4]The 1973 legislature instituted a new comprehensive special education law for children with exceptional educational needs (Chapter 89). It required all children between the ages of 7 and 16 to attend school programs and required all school districts to make programs available for people between the ages of 3 and 21. Between one-half to two-thirds of the increased expenditure is financed by the state.

[5]In 1976, the Milwaukee school district was ordered by the Federal District Court to desegregate.

to guarantee an equal amount of property value per pupil in order to support the education of every student; School District Equalized Valuation (SDEV) per pupil which is the full property value divided by the membership of the school district; Net Primary Guaranteed Valuation (NPGV) which is the difference between PSGV and SDEV; Primary Shared Cost (PSC), and $\frac{PSC}{PSGV}$ which is the Primary Required Levy Rate (PRLR). The formula is:

$$\text{Primary State Aid} = \frac{PSC}{PSGV} \times (PSGV - SDEV), \text{ or } (PRLR) \times (NPGV).$$

If NPGV is positive, the state provides aid which ensures that similar local tax rates provide equal educational revenues. The district chooses an expenditure level PSC, and the state then provides aid at an amount equal to the PRLR times the district's deficiency (relative to the guarantee) in its NPGV. If NPGV is negative, there must be payment as calculated by the formula of a Primary Negative State Aid from the district back to the state. In other words, the effect of the formula is to force high-spending high-wealth districts to reduce their spending and thereby narrow disparities in spending among school districts.

The Secondary State Aid Formula is used to fund secondary shared costs. The formula has the following elements: Secondary State Guaranteed Valuation (SSGV) which is the average equalized valuation per student for the entire state; School District Equalized Valuation (SDEV) which was described above; Net Secondary Guaranteed Valuation (NSCV) which is the difference between SSGV and SDEV;

Secondary Shared Cost (SSC), and SSC/SSGV which is the Secondary Required Levy Rate (SRLR). The formula is:

$$\text{Secondary State Aid} = \frac{SSC}{SSGV} \times (SSGV - SDEV), \text{ or } (SRLR) \times (NSGV).$$

If NSGV is positive, the state provides the requisite aid. If NSGV is negative, there must be payment, as calculated by the formula, of a Secondary Negative State Aid from the district to the state. It should be apparent that the secondary state aid formula also ensures that the same tax rate yields identical total school revenues regardless of the district's equalized valuation.[6]

(Late in 1976 the State Supreme Court ruled that both primary and secondary negative aids were unconstitutional. However, even in 1975-76 the primary guaranteed valuation for K-12 districts was set so high relative to the average equalized valuation that few districts would have been subject to the negative aid provision.)

Two other technical features of the formulas require mention. First, districts are required to apply at least a minimum tax rate to their guaranteed valuation to ensure that they provide some minimum level of support. (Actually, this is one of the 13 minimum standards.) This minimum tax rate is set at 5 mills for districts with grades K-12 and at 3 mills for districts offering only elementary grades or only

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[6] Because the 110 percent limitation is established on the basis of the prior year's cost, the current year limitation is somewhat less than 110 percent. As an example, assume that the prior year's state average cost was $1,000 and the primary shared cost ceiling for the current year was 110 percent of this, or $1,100. Now suppose the current year state average cost turned out to be 9.5 percent larger or $1,095. In this case, all costs exceeding the state average by $5 are secondary costs. These assumptions are plausible and should illustrate that the 110 percent limitation is considerably more binding than it might first appear.

high school grades. Second, the primary and secondary guaranteed valuations are only 92 percent as large for union high schools and 74 percent as large for elementary districts as compared to K-12 guarantees. This has the effect of providing such districts with an incentive to consolidate. The effect of this incentive has been negligible since only two districts merged in the past six years. Paradoxically, this incentive interferes with the desires of local districts to maintain control over their own schools. It also forces them to tax at a higher rate to provide equivalent spending per pupil for their children.

Transition Provisions. These provisions were designed to ease local implementation of the reform, and they reflect legislative compromise. Essentially, negative primary aids were cancelled for four years, until 1977-78. In addition, any loss of aid, compared to 1972-73, would be prorated over a 10-year period according to a special formula.[7] If equalization aid and transition aids were negative, the state would make up through zero minimum aids the loss of aid but only through 1975-76. (As noted earlier, the 1976 Supreme Court decision nullified the payment of negative primary and secondary aids.)

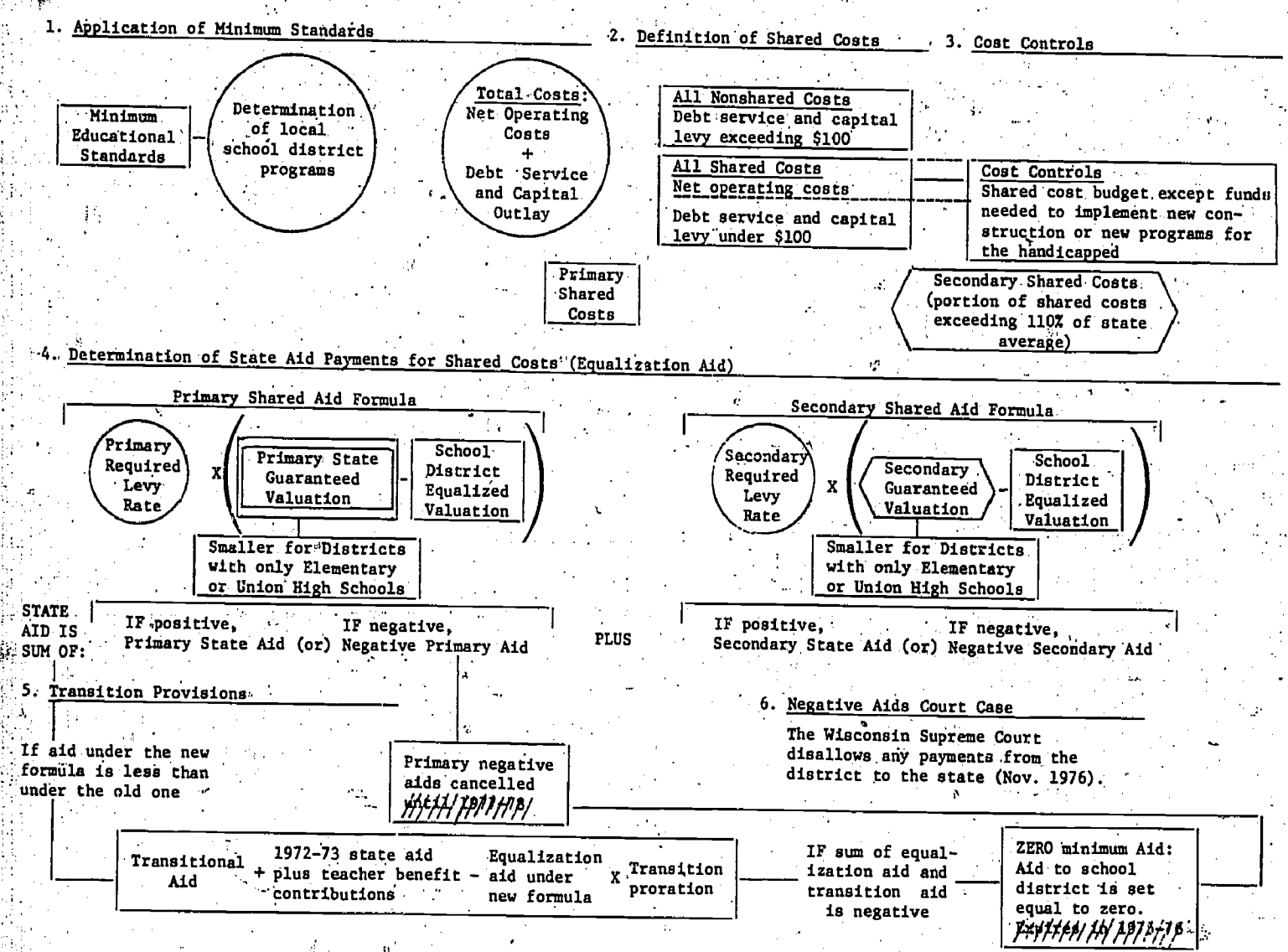
A Diagrammatic Representation of the School Finance Law

Figure 2 summarizes the key provisions of the 1973 legislation including the effect of the Wisconsin Supreme Court's ruling that negative aids are unconstitutional. The top sections encompass those

[7] If less aid was received in the current year compared to 1972-73, the district would receive 90 percent of the difference in 1973-74, 80 percent of the difference in 1974-75, and so forth until 1982-83.

FIGURE 2

WISCONSIN'S SCHOOL FINANCE SYSTEM
(all costs and valuations in per pupil amounts)



provisions related to (1) minimum standards, (2) the definition of shared cost, and (3) cost controls. The middle section indicates the provisions pertinent to (4) determining the amount of state aid for each district. The bottom section lays out the transition provisions (5), and the Negative Aids court decision (6). Appropriate symbols indicate who is responsible for decisions relevant to each of the provisions: circles indicate a local government decision, squares describe a statutory provision, double squares indicate a decision made in the appropriations process, and hexagrams show an index such as a statewide average. The slashed areas reflect the impact of the Court decision.

III. COMPARISON OF THE 1973 LEGISLATION TO PRIOR LEGISLATION

Our discussion of the 1949 law and its relationship to the 1973 reform follows the same general outline as in the previous section. The discussion emphasizes the origins of the reform provisions, similarities in the laws, and unique aspects of Wisconsin school finance.

School District Standards

The 13 minimum standards did away with the old distinction between "basic" and "integrated" districts by requiring all schools to meet the same standards.[8] Previously, some districts--called basic districts--had to meet only four of the present standards, those pertaining to teacher qualifications, salary and sick leave

[8] The old distinction was important because of differences in the calculation of state aid.

provisions, a 180-day school year, and the minimum mill rate. Integrated districts had to meet higher standards, similar to the present 13 standards. However, the 1973 standards possess a more contemporary flavor, including the requirement of a kindergarten program for 5 year olds, remedial reading programs, and school instructional materials reflecting society's cultural and pluralistic diversity. These new standards, even with their gradual phase-in, were expected to cause increases in expenditures for most if not all districts and somewhat larger increases for districts previously classified as basic districts.

Changes in Aidable Costs

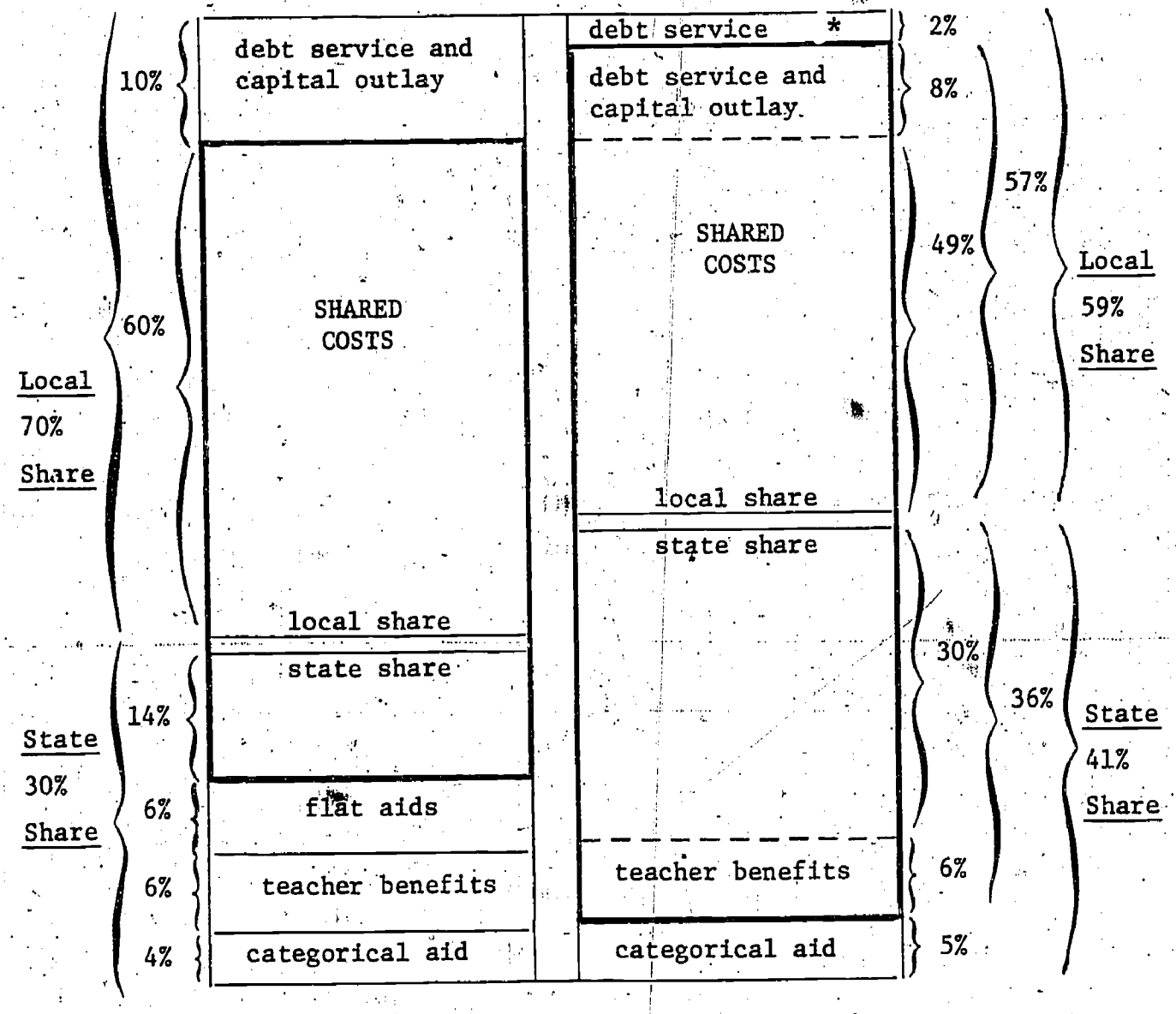
The total cost shared with the state was considerably smaller between 1949 and 1972 than under the new law. Figure 3 illustrates the prereform and postreform categories of costs and the government level that financed them.

In 1972-73, the year before the reform, all debt service and capital outlays were financed locally. They represented about 10 percent of educational costs. State payments of employer contributions for all teacher social security and retirement benefits amounted to 6 percent of total costs. The state also contributed categorical aids totaling 4 percent of educational costs. Flat aids averaging $77 per pupil were guaranteed to each district,[9] and these grants provided approximately 6 percent of the total costs. This left 74 percent of

[9]The aid formula was written in a way that flat grants went only to districts where equalization aid was less than the flat grant amount. In our calculations we assume that the flat grant is given to each district first. Aid exceeding this amount is considered equalization aid.

FIGURE 3

TOTAL SCHOOL COSTS AND SHARED COSTS,
1972-73 AND 1975-76



*Debt service and capital outlay exceeding $100 per pupil.

total costs in the shared cost category; the state paid 14 percentage points and the school districts paid 60 percentage points.

After the 1973 reform all costs were shared except state categorical aid and total debt service and capital outlay costs exceeding $100 which are financed entirely by the school district. Ninety-two percent of all educational costs--as contrasted to 74 percent previously--were subject to state equalization aid, with the state paying 36 percentage points and the school districts 57 percentage points of this total.

From 1972-73 to 1973-74, the state's proportion of total school costs rose by one-third, from 30 percent to 41 percent. In addition, the portion of costs funded by state equalization aid more than doubled, rising from 14 to 36 percent. This sharp increase occurred because flat grants and state payments of teacher benefits (also a flat grant) were merged into the shared cost category. Together they represent 40 percent of state aid prior to the reform.[10] This marked a continued trend away from flat aids which in 1949 comprised 70 percent of the school aid budget but had dropped to 20 percent by 1972-73.

The $100 limitation on debt service and capital outlay levies came from legislative compromise.[11] Prior to the reform, the 100

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[10] State funding of teacher benefits is antiequalizing since wealthy districts usually have more teachers per pupil and are also more highly paid.

[11] Both the governor and the Task Force on Educational Finance and Property Tax Reform felt no limitation was necessary. The governor's budget bill included provisions for state required approval for all construction. That provision was eliminated with the institution of the $100 limit.

percent local funding of construction was legitimized as a means of both preventing state control of building programs and discouraging elaborate and expensive facilities. The same rationale prevails currently in defense of the $100 limitation.

Increase in Guaranteed Valuation

The method of aiding shared costs, once these costs are defined, is essentially the same in both the old and new laws; each district is guaranteed a legislatively determined tax base. State aid is the difference between locally raised revenue and the amount that would have been raised had the district actually possessed the guaranteed tax base.[12] The 1973 law did change the construction of the guaranteed valuation formula. Costs which exceeded 110 percent of the state average are aided on the basis of the actual state average property valuation. No such distinction was made from 1949 to 1973. This new two-tiered guaranteed valuation helps redistribute state aid from high expenditure districts to low expenditure districts by increasing the primary guaranteed valuation.

Without the flat aid components, the original 1949 law would have been fundamentally the same as the 1973 reform had the state provided 40 percent of all educational costs.[13] In 1949 school

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[12] Colorado and Illinois have a similar formula. It should be noted that a guaranteed tax yield formula is only a different way of formulating a guaranteed tax base formula. A "dollar guarantee per mill" is equivalent to a "tax base for each mill levied." Kansas, Maine, Michigan, Montana, and Ohio distribute some aid in this manner.

[13] The study commission, whose recommendations formed the basis of the 1949 law, did in fact recommend a 40 percent funding level.

aids provided only 15 percent of total school funds, an amount sufficient to give a guaranteed tax base of $16,000 per pupil whereas the actual state average was $20,000. By 1958, the guaranteed valuation finally exceeded the state average. As shown in Table 1, the ratio of the guaranteed valuation to the state average remained constant in the late 1950s and early 1960s, hit another plateau around 1970, dipped a bit in 1972-73, and since that time has risen sharply.

TABLE 1

STATE AVERAGE VALUATION AND PRIMARY GUARANTEED VALUATION
1949-50 to 1975-76

School Year	State Average Equalized Valuation	Guaranteed Valuation	Ratio of Valuations
1949-50	$ 20,000	$ 16,000	.80
1954-55	23,500	21,000	.89
1959-60	24,957	33,000	1.30
1964-65	26,420	34,000	1.32
1969-70	29,478	42,000	1.42
1970-71	30,478	43,500	1.42
1971-72	32,736	47,900	1.46
1972-73	38,458	52,000	1.35
1973-74	42,700	71,200	1.66
1974-75	47,600	75,500	1.58
1975-76	55,900	96,500	1.72

Though Wisconsin's aid formula has not changed significantly, the state's share of education costs has increased and more aid has been funneled through the equalization formula rather than flat aids. This has resulted in a shift from providing minimum aid

to aid that has an equalizing effect. This shift has been accomplished by raising the guaranteed valuation from 80 percent of the average valuation in 1949 to almost 80 percent more than the average valuation in 1975.

High Spending Districts

For a number of years Wisconsin struggled with the problem of stimulating local expenditures on education while discouraging "excessive" per pupil expenditures by wealthy districts. From 1955 to 1969 the state paid 100 percent of costs in excess of 15 mills; this was raised to 17 mills in 1963. Once the mill rate limit was met, local school officials could increase expenditures with no change in local property taxes because the state paid the added costs. Over the period 1965 to 1969 the median school tax rate rose from 16.96 mills to 19.91 mills, and many districts received 100 percent state aid for expenditures in excess of the revenues raised by a 17 mill rate.

The depletion of the general fund caused by this provision stimulated an about-face by the legislature in 1969. It then shifted its emphasis from aiding districts with a high property tax effort to controlling costs.[14] Accordingly, state aid was tied to district property valuation and to expenditures relative to the statewide average cost. The effect was to shift state aid to high effort, low wealth districts.

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[14]This provision was actually called "cost controls" but its purpose was to limit state aid payments rather than to hold down the costs of providing elementary-secondary education. We avoid the use of the term "cost control" in describing the 1969 law, so as not to confuse the reader with the 1973 law's definition of "cost controls."

Two different problems were addressed by these provisions: (1) high tax effort necessitated by low wealth, and (2) tax base "exploitation" by wealthy districts resulting in "excessive" expenditures. The 1973 reform tackled the problems with two policy changes. First, all aid would depend directly on wealth and not on high tax rates. Until the 1976 State Supreme Court decision, negative aids removed the relation between high wealth and so-called excessive expenditures. Second, expenditures exceeding 110 percent of the state average for the prior year (secondary shared costs) would be partially financed by the state on the basis of wealth but at a lower rate.

The Supreme Court's negative aid decision allows about 7 percent of the districts having 4 percent of the state's students to continue taking advantage of their high wealth for all educational expenditures, since they can continue spending at their current high levels. With regard to secondary costs, those districts with property valuations exceeding the average, about half of the districts, can now tax a larger property tax base than those districts below the state average.[15]

Cost Controls

The cost control feature initiated in 1973 does not deal with the problem associated with aiding high expenditure districts. Currently, it limits all school districts to a 9.5 percent increase in per pupil expenditures. However, previous experience with cost

[15] In 1975-76, 80 districts received positive secondary aid and 76 would have paid secondary negative aid.

increases is pertinent to understanding the introduction of cost controls. Cost controls had not existed in any form before 1969 when the state paid all costs exceeding the revenue raised by the 17 mill rate. But because the drain on state resources increased so rapidly, the 1969 law relieved the state from this obligation and required local school districts to pay all costs exceeding the 17 mill rate. Moreover, when calculating state aid the portion of net operating costs which exceeded 10 percent of the average net operating costs of similar schools was to be excluded. These provisions shifted a greater share of the expenditures back onto the property tax. The idea of cost controls continued in the 1973 reform discussions because the state, through its redefinition of shared costs and its assumption of a large proportion of shared costs, did not want to see educational costs further escalated. Cost controls, therefore, provided a reasonable method of restraining cost increases. However, cost controls were initiated in legislation separate from the reform itself. In addition, the secondary aid feature of the formula attempted to hold down expenditures by higher cost districts, thereby representing an indirect type of cost control.

Financial Incentives for School Consolidation

Two features of the 1949 financing system encouraged school district consolidation. First, flat grants were about half as large for "basic" schools (small schools with few course offerings) as for "integrated" schools.[16] This distinction was abolished in the reform

[16] At the time of the reform, "basic" schools had only 1.5 percent of the pupils.

and instead 13 minimum standards were required of all districts. Second, the guaranteed valuation was smaller for elementary districts and union high school districts. This disparity in valuation guarantees was maintained in the new law even though school consolidation policy has been unsuccessful in recent years. The number of school districts has decreased by only one in the last seven years. The unchanged policy was achieved in legislative compromise since the governor's budget bill called for consolidation into K-12 districts.

The role of consolidation is important for two reasons. First, the incentive structure that did exist appears to have done its job by reducing the number of elementary districts from 4,500 to 53 and union high schools from about 50 to 11 over the period 1949 to 1973. However, the number of K-12 districts did not change much over the period. Interestingly, in 1973-74, one-third of the union high school districts and two-fifths of the K-8, as compared to only 4 percent of the K-12 districts, were negative aid areas. It is clear these districts did not consolidate because they wanted to provide presumably higher-quality (higher cost) schooling than would otherwise have been possible. Second, in the past the concept of equality of opportunity has been couched in terms of consolidation with its attendant effects, rather than in terms of expenditure. School finance policy simply addressed the issue differently then.

Conclusion

The Wisconsin school finance reform assumed that greater equality of opportunity would result if differences in wealth were completely removed as a determinant of school tax revenues and if

per pupil spending disparities among school districts were reduced. Did the Wisconsin law actually permit this?

The Wisconsin Supreme Court's decision on negative aids prevented the complete elimination of property wealth as a determinant of revenues. Essentially the same mechanism for distributing equalization aid remained from the prereform days, and that is a guaranteed tax base. Although Wisconsin has never had a foundation plan, a combination of eliminating flat aids, altering the definition of shared costs, and additional funding has resulted in a guaranteed valuation exceeding the actual valuation in almost all districts. Thus, now about 400 of the 436 school districts are guaranteed the same property tax base for school financing purposes.

The goal of equalizing expenditures is not reconcilable with power equalization. How the district power equalization concept of tax equity, designed to allow and perhaps encourage variations in local expenditures, came to be incorporated into the same reform as that calling for equal expenditures is a mystery of the legislative process we shall not attempt to dissect. As it worked out, the Wisconsin Supreme Court decision permanently undercut that intent.

Several features of the reform do provide financial incentives for low wealth districts to spend more and for high expenditure districts to spend less. Abolishing flat grants and the 100 percent financing of teacher benefits means that wealthy districts must reduce expenditures and/or obtain more local revenue. These changes helped free enough revenue to more than double the proportion of state aid devoted to equalization. By adding the first $100 of

nonoperating costs to the shared cost category, a substantial portion of local facilities could be partially financed by the state according to the equalization formula. The increase in the state funding level from 30 to 40 percent not only helped finance the new elements in the shared cost category, but also allowed the primary guaranteed valuation to jump from 136 percent of the state average to 172 percent. The concept of secondary shared cost provides an incentive for high expenditure districts, regardless of wealth, to reduce expenditures somewhat without discriminating against school districts according to wealth. This means there is no maximum amount of state aid, and no lid is placed on per pupil expenditures.

Cost controls, on the other hand, entirely frustrate the equalization provisions of the reform, even without the negative aids. While property tax relief is ensured, low spending districts are unable to "catch up" and thereby make expenditure decisions on a "wealth neutral" basis. In fact, high expenditure districts can raise per pupil dollar expenditures higher than low expenditure districts even though the percentage limitation is the same. Local decisions on how much to spend, an important justification for power equalization finance systems, is effectively thwarted. Thus, property valuations, to the extent they influenced prereform expenditure decisions, are still related to current expenditures.[17]

Our review of the legislation highlights some of its conflicting means for achieving its several and apparently opposing goals.

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[17] Cost controls could be made consistent with other features of the reform by allowing low spending districts a larger percentage increase in expenditures.

IV. SCHOOL FINANCE IN THE STATE'S ECONOMIC ENVIRONMENT

Our reading of the school finance literature indicates that evaluation and analysis usually stop within the confines of the education finance law. There are three important reasons for taking a broader approach. First, even full power equalization still leaves important income-based influences on school expenditure decisions. Second, the size of state aid to local governments helps determine the extent to which noneducation finance influences school expenditure decisions. Third, equalization provisions in noneducation state aid may influence school finance decisions differently in rich and poor districts.

This section examines Wisconsin's state-local fiscal environment and seeks to establish several important facts. One is that Wisconsin's state government allocates more aid to local governments than almost any other state and at the same time allocates less to state schools. It is also important to show the sources of state revenue and how they are distributed to local governments. Finally, major trends in state-local finance and their implications for school finance are summarized.

State Aid to Local Governments

Although the 40 percent level of state funding for precollege education is not high relative to most states, Wisconsin ranked fourth among all states in per capita aid to local governments in 1974, behind New York, Alaska, and Minnesota.[18] Wisconsin spent $345 per

[18] The data in this paragraph are from State Tax Collections, 1974, Bureau of Census.

capita on local government aid while other states, prominent in school finance, spent less: $316 in California, $158 in Massachusetts, $192 in Florida, $118 in Texas, and $133 in Kansas. When local aids and school aids are combined, Wisconsin had the lowest percentage of total state aid contributed to education, 36 percent compared to the 59 percent national average. At the same time, it allocated the highest percentage for general aid (aid with few spending restrictions). After these state revenue transfers to local governments, the ratio of Wisconsin's state to local expenditures ranked 48th in the nation at 30.2 percent while the local portion ranked 4th highest at 69.8 percent.

Despite Wisconsin's relatively low level of state funding for education, the large amount of aid to local governments for non-educational services could minimize or reduce the indirect influence of income and wealth on school expenditures. Therefore, we want to assess the way rich and poor school districts respond to the composition and distribution of the noneducation component of the state-local finance system.

Sources of State and Local Revenue

The sources of state and local revenue, local expenditures, and state aids to local government for 1974 are shown in Table 2. State personal and corporate income taxes account for well over half of state tax revenue, and sales and excise taxes comprise another third. Nearly two-thirds of all state and local revenues are raised at the state level. However, about 45 percent of state revenues

TABLE 2

STATE AND LOCAL REVENUES IN WISCONSIN, 1974-75

Revenue Source[a]	Millions	Percent	Type of Expenditure	Millions	Percent
Total state raised revenue	$ 3,368	(63.4)	Total state financed expenditures	$ 1,898	(35.6)
Individual income	873	16.5			
Corporate income	153	2.9	State aid to schools and localities	1,481[d]	(27.8)
Sales	510	9.6			
Excise taxes	118	2.2	General school aid	393	7.4
Public utilities	118	2.2	Other school aids	60	1.1
All other	1,573	30.0	Shared taxes:		
			per capita	161	3.0
			excess levies	115	2.2
			utility payments	16	.3
			adjustments	3	-
			State grants-in-aid to localities	316[e]	6.0
			Property tax relief:		
			General	195	3.7
			Personal property	147	2.7
			Homestead Tax Credit	42	.8
			Vocational, Technical and Adult Education Districts	33	.6
Total local raised general purpose revenue	$ 1,939	(36.6)	Total local expenditures from local revenue	$ 1,939	(36.6)
Net property tax	1,125[b]	21.2			
Schools $ 895					
Counties 225					
Cities 281					
Villages 26					
Towns 23					
VTAED 56					
Special assessments	14	.3			
Other taxes	22	.4			
Revenue for services to private parties	189	3.6			
All other	598[c]	10.1			
State and locally raised revenue	$ 5,308	(100)	State and locally financed expenditures	$ 5,308	(100)
			Federal revenue sharing:		
			Allocated to school aids	$ 55	
			Received by localities	103	
			Federal grants-in-aid to local governments	78	
			Federal aid channeled to schools	49	
			Federal aid to schools and localities	$ 285	

Source: Constructed by the authors from several documents--in particular, A Summary of Wisconsin State and Local Government Revenues and Expenditures for the Financial Periods 1974-75, Commission on State-Local Relations and Financing Policy, July 1976.

[a] Revenues are net of federal aid, local figures are net of state aid.

[b] The net property tax is calculated by subtracting general and personal property tax relief from the gross property tax. The breakdown by locality is for the gross property tax and will not add up to $1,125.

[c] Includes $65 million in school lunch and interscholastic athletic revenues, and $18 million in VTAE tuition, fees, and other revenues.

[d] This particular classification of aid to schools and localities was derived by the authors.

[e] These are categorical grants classified as judicial, general government, public safety, health and social services, transportation, sanitation, conservation, and housing.

(28 percent of all state and local expenditures) is redistributed to schools and localities. Thus, while localities cannot tax sales or incomes, they do receive large amounts of aid from the more productive and elastic state tax base.

Despite high tax levels in Wisconsin, the distribution or incidence of state taxes according to income differed little from the national average in 1974.[19]

The substantial amount of state aid to localities may only demonstrate that this method of expanding the local revenue base has been chosen in preference to giving the revenue raising power directly to localities by means of a local income or sales tax.[20] We cannot successfully show why Wisconsin moved in this direction, but it should be noted that in Wisconsin a per capita distribution of state collected taxes is redistributive and equalizing.[21]

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[19] A family with $7,500 adjusted gross income had an effective income tax rate of 2.5 percent in Wisconsin compared to 1.1 percent nationwide and 5.5 percent for the federal income tax. A family with a $17,500 adjusted gross income paid 4.6 percent for Wisconsin personal income taxes compared to the 2.1 percent national average and the 10.9 percent federal tax rate. Overall, Wisconsin state and local taxes (excluding business taxes) were the nation's highest in family income brackets exceeding $10,000. These data came from: Stephen E. Lile, "Family Tax Burdens Compared Among States and Among Cities Located Within Kentucky and Neighboring States" (Kentucky Department of Revenue, December 15, 1975). Many of the data underlying that study were provided by the Advisory Commission on Intergovernmental Relations.

[20] The Wallace Commission on State and Local Finance in Wisconsin (1976) came to the conclusion that local income taxes would not be any more equitable than the property tax and that local sales taxes were more inequitable than the existing property tax.

[21] In a per capita aid formula, high income localities receive less aid from the state than they contribute in taxes if one presumes the state tax is something besides a head tax. The system could even be regressive with respect to income and still equalize.

On the local revenue and expenditure side, schools take about 60 percent of all property tax revenue even after the 1973 reforms.[22] This proportion is one of the highest in the country and may explain why schools in particular are blamed for high taxes in Wisconsin. Cities and counties each receive about 20 percent of property taxes, and other local tax sources produce relatively small amounts of revenue. Moreover, the sixteen Vocational, Technical, and Adult Education Districts (VTAED) also levy a property tax. In addition to local spending of $1,939 million from their own sources, VTAE spent $1,481 million provided by the state and $285 million from the federal government.

State aid to localities comes in several forms as shown on the right side of Table 2. The shared tax program has two major components: per capita aid which is distributed in proportion to population and excess levy aids which go to localities with high tax rates. (Beginning in 1976, this form of aid increased substantially and is now based on property valuation, as is the school aids formula.) State grants-in-aid (categorical aid) comprise the largest component after school aids. General property tax relief appears as a credit on the property owner's tax statement but, as with the excess levy aid in the shared tax program, this relief goes more frequently to taxpayers in high tax rate areas. Personal property tax relief applies to manufacturing equipment, inventories, and livestock. The Homestead Tax Credit program grants property tax relief directly to

[22] Since the state pays for some of these taxes through the Homestead Credit program, the actual property tax that individuals pay is lower.

individuals based on income and the dollar value of the property tax (or rent in the case of renters).

The levy limit is a recent innovation in state finance. It serves a function for municipalities similar to cost controls in the school finance reform: it ensures that property tax relief results from higher levels of state aid by limiting the extent to which local expenditures can be increased. From 1973-74, local levies could rise by no more than 6 percent. Since 1975, the limit has been the percentage growth in statewide property values. Since the levy equals the product of the tax rate times the tax base, the limit could be reached as a result of either rising property values, over which municipalities have little control, or higher tax rates which they do control. Population growth and the resulting increases in property values and need for public services are not part of the formula. Perversely, a tax rate cut is often required in such situations to keep revenue within the established limit. School cost controls, on the other hand, apply to per pupil expenditures, whereas the levy limit is applied to most forms of revenue including the property tax, federal revenue sharing, user charges, and state shared taxes. The levy limit is important to school finance through its impact on noneducational public expenditures or tax rates.

State-Local Finance Trends and Their Implications for School Finance

A program by program description of state aid to local governments would show many relationships between the school aids formula and the revenue distribution formulas. The scope of this

evaluation precludes such a thorough examination. However, we have identified the major trends in noneducation finance:

- Aid to local governments from the statewide tax base has been preferred to expanding the local tax base through nonproperty taxes.
- More and more aid is being distributed through equalization formulas.
- There has been a change in emphasis from aiding localities with high tax rates to equalizing tax bases.
- Aid targeted to individuals rather than to government units, such as the homestead credit program and general property tax relief, has been expanding rapidly.
- State concern about local accountability has resulted in cost controls for local government as well as schools.

The implications of these trends for school finance cannot be ignored. The following five points summarize the major connections between non-educational and educational finance. (1) Each additional dollar spent on schools is aided by the General Property Tax Relief Program for about half the population (those residing in municipalities with a levy above the state average) at the rate of 24 cents to the dollar. (2) Some state noneducational aid programs are equalizing. To the extent they are, wealth neutrality in school finance is enhanced. (3) The homestead tax credit by effectively dealing with the regressive features of the property tax and limiting its eligibility to low-income people facilitates the development of an effective, wealth-neutral school finance system. (4) Levy limits on

municipalities and cost controls on schools have prevented low wealth and low income districts from fully responding to legislated changes in education and noneducation finance. (5) Transition features in school aid and local aid formulas have postponed the responses of high wealth districts to changes in school aid and local aid programs.

V. POLITICS OF WISCONSIN SCHOOL FINANCE REFORM

In the post-Rodriguez era of educational finance, reform has progressed on a state-by-state basis. One result has been a growing literature on the politics of reform. As economists, we are primarily concerned with resource allocation, efficiency, and equity. At the same time we believe it is no less important to describe the political environment surrounding the Wisconsin reform and thereby contribute to an understanding of the intended policy goals.[23] Such a review requires us to examine the entire reform package as well as the educational financing provisions.

We begin with a brief chronology of the events. The description is then divided into a number of specific topics: the gestation period of the reform, the role of surplus state funds, demands for property tax relief, legislative compromise, educational interest groups, and the role of the court cases. The final section identifies the political elements of the Wisconsin reform as compared to other states.

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[23] We rely heavily on a Ph.D. dissertation (Educational Administration, University of Wisconsin, by Terry Geske). The main points are summarized in Terry G. Geske and Richard A. Rosmiller, "The Politics of School Finance Reform in Wisconsin," Journal of Educational Finance, 1:2 (Spring 1977), pp. 513-532.

Chronology

The chronology of the Wisconsin school finance reform shown in Figure 4 demonstrates that the gestation period for the final 1973 reform began long before the court cases occurred. The Committee of 25 in 1965, the Tarr Task Force in 1969, and the Kellett Commission in 1970 all suggested more equalization aid in one form or another. All three groups operated under a Republican governor and legislature. The Kellett proposals were the most far-reaching, and it seems fair to say that had a Republican been elected in 1970 a plan for school finance reform would have been ready for consideration.

Several key political changes took place. A Democratic governor took office in 1970 and the elections two years later brought a huge Democratic majority in the Assembly. This gave the Democrats a majority on the joint finance committee despite the Republican hold on the Senate. As the first 4-year term governor, Patrick Lucey did not have to design the 1971 budget with an upcoming election in mind. He did, however, take advantage of a program budget approach adopted in the mid-1960s that assumed some policy decisions would be made an integral part of the budget bill. By this route some property tax reforms were obtained during his first budget biennium, and an unsuccessful attempt was made to improve school equalization aid by placing employers' contributions to teacher benefits in the shared cost category.

The Serrano decision added new impetus to the view that school finance legislation should help bring about more equitable property taxation. This led Lucey to create still another group, a task force

FIGURE 4

CHRONOLOGY OF THE 1973 WISCONSIN SCHOOL FINANCE REFORM

1965 -- Committee of 25 reviews the 1949 school aid formula. It concludes that the present school aid formula is adequate and the emphasis on equalization and school district reorganization should continue.

1969 -- Tarr task force on local government finance finds the current school aid formula is responsive to constitutional and statutory criteria. State aids for spending above 17 mills, which was found to benefit primarily wealthy districts, should be stopped but flat grants should be maintained.

1970 -- Kellett Commission on Education proposes freezing flat grant amounts, including income in the formula to determine equalization, and raising the state share of support for education from 30 to 40 percent.

-- Democrat Patrick Lucey elected to Wisconsin's first 4-year governorship replacing the retiring Republican governor, Warren Knowles.

1971 -- Complete revision of the state shared tax formula occurs.

-- Expansion of the Homestead Credit program to include all poor as well as the aged takes place.

-- Governor fails in attempt to place teacher retirement benefits in shared cost category. State continues to pay 100 percent.

-- Serrano, the California school finance case, is decided in August.

-- In November, Governor Lucey states intention to create a Task Force on Educational Financing and Property Tax Reform.

1972 -- From January to December the task force deliberates.

-- In August the state teachers association becomes vocal and active in the task force.

-- By November and December the magnitude of the expected budget surplus is turning out to be greater than expected.

-- In the November election, Democrats gain a 62-37 advantage in the assembly but Republicans maintain a 13-15 majority in the senate. Democrats have an 8-6 majority on the Joint Finance Committee.

1973 -- January. Governor's Budget and Finance Policy Proposals are presented.

February 1. Task force report is published.

The governor's budget proposal adheres to the task force recommendation. The major change is the inclusion of teacher benefits and capital outlay in the shared cost category.

March 21. Rodriguez, the Texas school finance case, is decided.

May 1. Joint Finance Committee submits the budget bill to the assembly. Changes phase-in period from 3 to 10 years.

May 10. The assembly passes the bill 55-43.

May 17. The senate votes nonconcurrence. The conference committee is established.

June 12-19. The governor and Democrats on the conference committee initiate tax and school finance compromise proposals:
-Manufacturing and equipment property tax exemption
-Increase in the personal property tax exemption
-Delay negative aid payments until 1975-77
-Raise primary shared cost ceiling from 107 to 110 percent
-Eliminate the requirement that all school districts reorganize into K-12 districts.

June 29. Conferees reach tentative agreement on the budget.

July 17. Senate rejects the budget report on a 17 to 10 vote.

July 22. Senate reconsiders but again rejects the budget report on 14-13 vote.

July 24. Senate passes budget report 18 to 15. Five Republicans vote for the budget, 2 Democrats do not.

August 2. Governor Lucey signs budget into law.

to make recommendations for school finance reform. This time Lucey fully exploited the program policy budget approach by including dozens of policy decisions in the 1973-75 budget bill. School finance reform was prominent, drawing heavily on the work of the task force whose report appeared early in 1973. Although the Rodriguez decision came shortly afterwards, it seemed to have had little or no effect on the budget bill approved by the joint finance committee five weeks later.

As it worked out, few provisions in Lucey's education reform package were sacrificed, although a longer delay in its implementation was gained by opponents. Where concessions had to be made, the governor and the Democrats preferred to accommodate on tax issues.

Shaping the Reform

Rather than giving a blow-by-blow account of the passage of the school reform law, we want to highlight several areas of interest. These include: the need for increased revenue when implementing reform, the role of property tax relief, the effect of education interest groups, compromise on and packaging of the program, and the role of the court cases.

The Ease of Financing the Reform. How to raise the substantial amount of state revenue necessary to provide local tax relief never became an issue. In addition to the propitious appearance of $170 million in federal revenue sharing funds, a dramatic upsurge in the state's economy resulted in a state surplus of $138 million in June 1973 and led to an anticipated tax growth of $573

million for the upcoming 1973-75 biennium. This eliminated the need for new taxes, and the extra revenue made it possible to minimize the number of school districts that would lose funds despite substantial increases in aid to low wealth districts. Initially only 28 of 436 school districts were to have paid negative aids of $23.3 million to the state treasury over the biennium, but compromise measures further reduced the number of loser districts. The large influx of funds also enabled the governor to place the teacher social security and retirement benefits, then financed by the state, into the shared cost category. These flat grants cost $80 million a year. The Task Force on Educational Financing and Property Tax Reform had considered this option but believed the number of loser districts could be held down by simply keeping local costs at a minimum.

Since some of the revenue windfall was not fully realized until well after the legislative sessions began, additional millions of dollars became available for compromise. This helped make it possible to give long desired business tax concessions to the Republican-controlled Senate, not at the expense of other policies but simply as a part of the total budget package. This concession helped assure passage of the school finance reform.

Property and Other Forms of Tax Relief. The school finance court cases focused property tax concern on school finance. The political system then used the various federal and state court mandates to highlight the source of the problem, the property tax. By early 1972, taxpayer protests in Wisconsin became more organized, especially in the rural areas. Several townships voted to withhold property tax

revenues to schools by placing the funds in escrow as a protest against rising property taxes.

The publicity of these actions undoubtedly influenced the task force's initial deliberations. One member, the Department of Administration Secretary, proposed that 95 percent of educational costs be financed by a statewide property tax in 1972-73, the sum provided should be held constant in future years, and other state taxes should be used to provide any additional revenues needed. The task force eventually recommended that the local portion of all educational expenditures be reduced to the amount raised by a 15 mill levy. This represented a 5 mill reduction. Although the governor refused to make this 15 mill index part of the law, the increased funding accompanying reform actually did reduce property tax rates to this level during the first year. Throughout the life of the task force and during the legislative session, the governor and his advisors insisted on some form of strict cost controls; first, a 5 percent limit to annual cost increases, then stretched to 7 percent in the budget bill, and finally set at $55 in the law. Republicans in the legislature were forced to accept cost controls but in an effort to ensure property tax relief they fought for direct property tax relief payments. In fact, $128 of the $521 million identified for property tax relief in the governor's budget over the next biennium was targeted for direct property tax relief: $33 million to the Homestead Credit program, $75 million for General Property Tax Relief, and $20 million for Personal Property Tax Relief. Non-property taxes were also reduced. The manufacturing and machinery

tax exemption totaled $60.5 million over the biennium, individual income tax reductions equaled $26.4 million, and a new corporate income tax credit was worth $16 million.

Education Interest Groups. Little consensus or unity existed among education interest groups. The state teachers association, the Wisconsin Education Association (WEA), was the strongest and most vocal group, and it vigorously attacked the governor's task force for concentrating on property tax relief while ignoring the issue of educational opportunity. The organizations representing school boards and school district administrators weakly opposed most reform measures because a few member districts were adversely affected.

Packaging and Compromise. Because school aids are part of the general budget bill, it is difficult to determine what is "packaged" with school aids and where compromise took place. School aids should definitely be considered part of the property tax relief package. These aids competed for the same pool of funds as other tax relief programs. In addition to the tax and revenue measures already mentioned, the state assumption of $118 million in county health and welfare costs can be considered another element of the package.

The school reform package faced pressure to compromise from two groups--from Democrats representing districts that would lose funds and from Republicans generally. The Democratic opposition, working through the joint finance committee early in the session, gained an extended phase-in for negative aids and changes in the method of financing capital expenditures.

The ten year phase-in represented the biggest change in the school reform package. The task force recommended two years and the governor asked for three years in the budget bill. In an apparent effort to mollify Democratic districts that would lose school aid, the Democrat-controlled joint finance committee instituted the ten year transition before the bill even got to the Assembly. As a consequence, only four districts had to give up aid, and the total amount was only $1.4 million for the 1973-75 biennium. The phase-in was similar to the 10 percent per year hold-harmless clause of the 1971 shared tax change that has since been incorporated into several other laws. Both the governor and the task force wanted debt service and capital outlay included as shared costs and tied to provisions requiring approval by the Department of Public Instruction for school construction. The joint finance committee decided to limit the aidable debt service costs to $100 instead, knowing that the state average was $125 per pupil and likely to rise in subsequent years. Presuming future building plans were not changed by the formula, the $100 limitation saved $20 million per year. The requirement to have state approval for new construction was attacked as a bludgeon to force school district consolidation. The combined efforts of the school board and district administrators associations were influential in blocking the state approval provision.

Compromise with Republicans took place primarily in the conference committee following senate defeat of the budget bill. The proposed machinery and equipment exemption was linked directly to school finance and is generally credited with breaking the log jam.

Businesses in the districts that would lose school aid applied considerable pressure. Democrats again preferred delay in implementing the school aids package by weakening the negative aid provision; as a result negative aid payments were postponed until the 1976-77 school year. The Republicans saw this as a benefit since they now had one chance at the governorship in 1974 and two chances (1974 and 1976) to gain assembly control prior to implementation of negative aids. Republicans succeeded on local control issues by eliminating the requirement that all school districts reorganize into K-12 districts by 1975 and by increasing the primary shared cost ceiling from 107 percent of the state average to 110 percent.

Similarities and Differences in Reform: Wisconsin and Other States

A conventional wisdom has arisen regarding the politics of school finance reform and is characterized by the following assumptions. The state generally assumes more responsibility for bringing low expenditure districts "up" to higher expenditure levels by substituting broad-based state taxes for local property taxes. Reform is intimately tied to property tax relief. New or expanded equalization expenditures are almost always associated with a rise in available state revenues. A strong coalition of education interest groups is needed.

It is evident from our description of the politics of reform in Wisconsin that these characterizations are not accurate. Greater assumption of state responsibility and equalization on a rising tide of state revenue aptly fit the Wisconsin situation. Merely redistributing revenue would result in too many loser districts and too

much opposition, regardless of party lines. Increased aid was linked to property tax relief rather than improving educational quality by raising educational expenditures. Moreover, spending restrictions circumscribed the ability of low spending districts to catch up by increasing their spending. Finally, as in most states experiencing substantial reform, the gestation period began long before the Serrano court case.

The packaging of the school aid reform is similar to other reform states. Like Maine and Illinois, tax relief was an integral part of the reform. Greater assumption of local welfare costs by the state, as in Kansas, accompanied the school finance package. Support and repeal of tax measures unrelated to education took place, as in Maine, California, and Kansas.

The Wisconsin experience diverges on other points. Educational interest groups were remarkably fragmented. The state teachers organization first wanted full state funding but then supported the power equalization provisions. Representatives of school boards and district administrators opposed power equalization. The latter two groups split on the issue of school district consolidation. The positive and vocal support for reform from the teachers organization contrasts sharply with the opposition to reform exhibited by the teachers' union in Texas.

Consistent, demanding, and unified efforts to reform school finance came from the governor and Democratic legislators. The situation is similar to Minnesota where leadership came from the state-level political system rather than educational interest groups,

and it differs dramatically from the foot-dragging legislative initiatives in Texas, Massachusetts, Kansas, and California. Instead of a court case similar to Serrano II, which challenges the adequacy of California's response to a reform mandate, Wisconsin's Supreme Court has circumscribed the Wisconsin reform for some time to come.

VI. OUTLINE FOR THE EMPIRICAL STUDY OF THE WISCONSIN REFORM

This short section describes the criteria for evaluation, methodology, and data for the ensuing empirical analysis. A full description of the data is reserved for the Appendix.

Criteria for Evaluation

Our empirical examination follows the goals of the reform during its political evolution and generally acceptable notions of what school finance reform ought to involve.

Ensuring across-the-board property tax relief, narrowing the interdistrict dispersion of educational expenditures, raising the minimum educational standards, holding down costs, and maintaining local control over tax and expenditure decisions clearly emerge as the dominant goals. As noted earlier, however, these goals often conflict with one another. Equalization can mean restrictions on local taxation and state control of expenditures, thereby conflicting with local control; property tax relief conflicts with raising educational standards. Moreover, the instruments used cause problems. Cost controls as constructed in Wisconsin ensure property tax relief but inhibit the narrowing of the interdistrict expenditure dispersion and also circumscribe local control. Negative aids also reduce local

control while tax relief enhances it. Assessing the extent to which the goals and instruments impinge upon each other is a difficult task.

Considerations of economic efficiency aside, school finance reform is usually dominated by notions of equity. Presumbly, certain groups of people should benefit: those living in low tax base districts, those who face the highest taxes, those with the lowest incomes, and so on. The ensuing empirical analysis will show that these groups were usually disadvantaged prior to the reform in Wisconsin. We must determine how much their situation improved because of the reform. This leads to a series of related questions.. What is the appropriate measure of the effects of the reform and its associated legislation? Is it the increase in expenditures, the increase in state aid, or the change in the tax rate? Is the increase best defined as a percentage change or the dollar change? Or should we be concerned only with the post reform levels of expenditures and state aid?

While the ultimate benefits of school finance reform should be reflected in student achievement, and over longer periods in the improved life chances of students, we have had to be content with presuming that larger expenditures benefit students. We have also assumed that a dollar expenditure in urban areas has the same value as an expenditure in rural areas. The limited scope of this study as well as the unavailability of needed data dictate both these assumptions.

As in most other studies, we rely on averages for individual school districts. Though we can estimate the effects on districts

with different characteristics, such as property wealth or income, the data do not allow us to pinpoint the effects within school districts on, for example, groups with high property wealth or low family income.

Definition of School Finance Reform

The "reforms" examined in this study include not only the permanent legislative changes embodied in Chapter 121 of the Laws of Wisconsin 1973, but also subsequent amendments in 1975. Related legislation contained in the 1973 and 1975 budgets, reflected in Section 550, Chapter 90, Laws of Wisconsin 1973 and Sections 608-610, Chapter 39, Laws of Wisconsin 1975 are also examined. It is our hope to capture the full dimensions of the "reform" through 1975-76.

Methodology and Presentation of the Data

Our presentation of the empirical data does not try to gloss over the complex problems encountered when evaluating legislation with multiple and often conflicting goals. The statistical concepts are simple and have been chosen to portray accurately the overall postreform situation. At the same time, they downplay extreme situations that so often dominate the literature.

Several matters of concern in the data presentation should be noted. When possible the data were collected for the school years 1972-73, the year preceding the reform, and 1975-76, the most recent year for which data were available. Related noneducation data were obtained for calendar years 1972 and 1975. The three-year span was chosen over a one-year pre- and postreform analysis so as to reflect

more fully how school district voters and administrators reacted to the changed incentives provided by the reform. One disadvantage of this method is that other variables, not related to the reform, such as changing enrollments, rising property values, or noneducation finance, also produce changes in variables that are of interest. This serves to undercut somewhat the ceteris paribus analysis we want to undertake. However, we have controlled for these changes to some extent.

Other important data on the characteristics of school districts were available only from the 1970 census. This does not create a serious problem in our evaluation because socioeconomic conditions do not change rapidly and do not usually affect districts differently over relatively short periods, such as the three-year period we have selected.

All data have been weighted by school district enrollments in the calculation of our various measures. This has the effect of making students rather than school districts the unit of observation. We found no plausible reason within the goals of this study for giving a small school districts the same level of importance as large districts. This is not to deny that good reasons may exist for using unweighted data in expenditure functions and behavioral studies of school districts.[24]

Section VIII describes the statewide impact of the 1973 reform. The major tables follow essentially the same format. For each of the variables of interest we present the means and medians,

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[24]Our results differ from those of others because we used enrollment weighted school district data.

as well as several measures of dispersion or variation (standard deviation, coefficient of variation, etc.). These measures give an indication of the distributions and changes in them over time. We show several measures of dispersion, since no single measure of dispersion can usually describe accurately all changes that are taking place. By presenting the data for 1972-73 and 1975-76 together, changes in their levels and distributions can be readily compared.

The question of who benefited from the reform is taken up in Section VIII. A comparable format--essentially cross tabulations--is used for several major tables. Based on the average characteristics of their districts, pupils are assigned to one of five equal-sized groups or quintiles, depending successively on the property wealth, tax rate, or income of the districts from which the pupils come. For each variable, the table entry gives the 1972-73 mean for pupils in each quintile, the 1975-76 mean for pupils in each 1972-73 quintile, differences in the means, and percent increases in the means. This allows the reader to determine, for example, how state aid received by students in the lowest income quintile changed over the three years subsequent to the reform.

The same approach is extended to examine the interplay between two variables. For example, students are categorized by two variables instead of one: their school district's tax rate quintile (a measure of effort) and their district's property tax base quintile (in the absence of state aid, a measure of the ability to pay). This approach allows the identification of interactions not evident in one-way classifications.

Section IX is devoted to an examination of the program effects of the reform and its associated legislation. This includes consideration of negative aids and transition features, cost controls, nonshared costs, and the 13 minimum educational standards. Similar presentations of the data are used here.

We have attempted to demonstrate the effects of the reform in a way that can be readily comprehended by readers. For this reason we purposely avoided the use of regression analysis. Our use of cross tabulations makes the presentation somewhat longer but we hope more informative. In subsequent work we plan to use regression analysis to explore in more detail Wisconsin's school finance reform.

The Data

Elementary districts and the union high schools whose boundaries contained these districts have been treated as if they were single K-12 school districts, since elementary districts belong to a single union high school in Wisconsin. This reduces the total number of school districts in the state from 436 to 381. Census data were absent for five small school districts totaling only 1,141 students--a little more than one-tenth of 1 percent of the state's entire enrollment. All other data were available for all 381 districts. By collecting data for all districts, problems with sampling and statistical confidence are avoided, resulting in simplified analysis and presentation of the data.

More than 20 variables were collected for both 1972-73 and 1975-76. The census data provided 16 more variables. Transformations and combinations of variables extended the data base. In addition,

noneducation data were collected for all of Wisconsin's 1,870 units of local government--16 variables for 1972-73 and 29 variables for 1975-76. Using the property value weighting mechanism that determines a locality's share of the school district's budget, we aggregated the noneducation data into the respective school districts. While this procedure may be misleading in a few instances, it is certainly more accurate, especially for rural areas, than choosing the school district's principal locality and assigning those data to represent the entire school district.

We are indebted to Wisconsin's Department of Public Instruction and Department of Revenue, and to the University of Wisconsin-Research and Development Center for Cognitive Learning for providing data in both published and unpublished forms.

A more complete description of the data and their sources is in the Appendix.

VII. OVERALL EFFECTS

This section presents the findings on the overall effects of the school finance reform legislation, and it is followed by another section that describes in more detail how different kinds of school districts have been affected. The section begins with a description of the general setting in which these overall effects occurred and then proceeds to examine these effects.

General Setting

The setting for our examination of the overall effects for the 1972-73 through 1975-76 period is characterized by a leveling

off of elementary-secondary enrollments, rapid increases in property values associated with economy-wide inflation, and a refashioning of state-local fiscal relationships by the state government, as shown in Table 3.

TABLE 3

PROFILE OF NONEDUCATION FACTORS AFFECTING SCHOOL FINANCE

Line	Average Values
1. Enrollment (pupils per school district)	
1972-73	2,509
1975-76	2,399
2. Property values (per pupil)	
1972-73	$ 38,115
1975-76	53,658
3. Total local tax rate (mills)	
1972-73	28.43
1975-76	21.69
4. Noneducation state aid (per capita)	
a. Equalizing aid	
1972-73	$ 37
1975-76	56
b. Categorical aid (per capita)	
1972-73	$ 126
1975-76	187
5. Total local revenue (per capita)	
1972-73	$ 245
1975-76	241
6. Median family income	
1969	$ 10,034

Average school enrollments (line 1) dropped slightly, with a mean enrollment of 2509 in 1972-73 as contrasted to 2399 in 1975-76. (The median enrollment was also stable, from 1310 to 1217. The median

is much lower than the mean because it is unaffected by the rather few large-enrollment school districts.) This is a marked contrast to steady and sharp enrollment increases characteristic over the previous two decades.

Average property value per student (line 2) jumped by about 40 percent, from $38,115 to $53,658, due to a variety of reasons that need not be explored here.[25] This increase meant that even with unchanged local tax rates, total local revenues as well as school revenues would have increased rapidly. Actually, the state increased its aid to localities so that the total local tax rate (line 3) fell by over 20 percent, from about 28 to 22 mills. Increases in both noneducation state aid and school aid made this decrease possible. Although both equalizing and categorical aids increased sharply (line 4a and 4b), the bulk of the absolute increase in noneducation aid came from categorical aids. These increases--and their reflection in lower tax rates--permitted a slight decline in average (mean) total locally-raised revenue per capita (line 5), from $245 to $241. In short, substantial property tax relief provided by increased noneducation state aid led to a highly favorable fiscal climate for local governments.

Finally, we show median family income (line 6) for 1969, the most recent year for which such data were available. This datum provides another dimension of ability to pay. Family income also reflects in a general way some of the nonschool, nonfinance characteristics of districts from which the students come.

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[25] Included are inflation-induced rises in property values, more frequent changes in assessments, and improved assessment procedures.

School Costs

The broad dimensions of changes in school costs are revealed in Table 4, which compares costs in 1972-73 with those in 1975-76.

TABLE 4

SCHOOL FINANCE COSTS PER PUPIL, 1972-73 AND 1975-76

	1972-73	1975-76	Percentage Change
Net operating costs (comparable data for both years)	$ 956*	$1312	37%
Net operating costs (noncomparable data)	891	1312	48
Nonoperating costs	140	149	5
Total school costs	1096	1461	34
Shared costs**	891	1412	58

*Includes teacher social security and retirement which were funded by the state in a different budget category in 1972-73.

**Same as net operating costs in 1972-73; includes the first $100 of nonoperating costs in 1975-76.

Several changes deserve comment. First, net operating costs on a comparable basis rose from $956 per pupil in 1972-73 to $1312 in 1975-76; the $956 figure includes teacher social security and retirement costs which were not considered part of net operating costs until 1973-74. Henceforth, the $956 figure is used as a basis for comparison of net operating costs. The increase of 37 percent was somewhat less than the increase in potential local tax revenue, as reflected by the 41 percent rise in property wealth shown in

Table 3. Second, nonoperating costs remained virtually constant during the period, rising from $140 to $149 per pupil. Third, total school costs increased from $1096 per pupil to $1461 per pupil, for a 34 percent increase. However, shared costs rose much more--by 58 percent.

The way net operating costs were funded, shown in panel A of Table 5, also shifted dramatically during this period, largely as a result of the school finance reform. Absolute increases in federal support and state categorical aid were negligible. The big increase came in state equalization aid where the flat aid of 1972-73 was converted into equalization aid and heavily augmented by the state's decision to increase its total aid from 30 to 40 percent of costs. Local sources provided a smaller increase--$141--equivalent to 40 percent of the overall increase.

Additional perspective on these changes is provided in panel B of Table 5. Total school costs, as already noted in Table 4, rose by 34 percent, less than the 37 percent increase in net operating costs. The greater broadness of the definition of net operating costs by 1975-76 accounts for the larger percentage increase for net operating costs. While this difference is not large, it does suggest the need for caution in evaluating the various claims made for school finance reform.

School Finance Changes

Given this background, we turn now to appraise the effects of the school finance reform. We first examine changes in the local

TABLE 5

NET OPERATING COSTS AND TOTAL EDUCATIONAL COSTS PER PUPIL, 1972-73 AND 1975-76

A. Net Operating Costs Per Pupil

	1972-73	1975-76	Change Absolute	Change Percentage
Federal aid	$ 43	$ 58	+15	+35%
State aid	354	554	+20	+56
Flat aid	76	0	-76	--
Equalization aid*	170	489	+319	+188
Categorical aid	43	65	+22	+54
Social security-retirement	65	0	-65	--
Local sources	559	700	+141	+25
Total net operating costs	956	1312	+356	+37

B. Total Educational Costs Per Pupil

	Net Op	Other	Total Costs	Net Op	Other	Total Costs	Percentage Change In Total Costs
Federal aid	43		43	58		58	35%
State aid	354*		354	554	38***	592	67
Local sources	559	140**	699	700	111****	811	15
Totals	956	140	1096	1312	149	1461	34
Total educational costs			1096			1461	34

*Includes $65 for social security and teacher retirement from separate noneducation budget for 1972-73.

**Nonoperating costs.

***State share of nonoperating costs - up to $100 of nonoperating costs are considered part of shared costs in 1975-76.

****Local nonoperating costs over $100 plus local share of up to $100 nonoperating costs--the amount not paid by state funding.

school tax rate. These changes reflect the extent to which property tax relief, a principal factor motivating the reform, was provided. Next, we examine changes in the level and dispersion of net operating costs, sources of revenue, total state aid and its components, and locally raised school revenue.

We present a variety of measures to describe the effects of the school reform legislation. For an indication of the changing average levels of different variables, we show mean and median values; the means and medians are generally similar except for distributions that are heavily skewed. The dispersion around the average of these different variables is reflected by several different measures which together provide more complete information than is reflected in any single measure of dispersion. The standard deviation is a measure of the absolute dispersion around the mean. The coefficient of variation is a measure of relative dispersion obtained by dividing the standard deviation by the mean. The interquartile disparity index is found by dividing the value for the 75th percentile by that for the 25th percentile and may also be considered a measure of relative dispersion. The upper-lower tail disparity index, as we label it, is found by dividing the value for the 95th percentile by that for the 5th percentile.

Local School Tax Rate

The amount of property tax relief provided through school finance reform is reflected by reductions in the local school tax

TABLE 6

PROFILE OF SCHOOL FINANCE CHANGES AND THEIR EFFECTS

	Mean (1)	Median (2)	Standard Deviation (3)	Coefficient of Variation (4)	75th / 25th Percentile (5)	95th/5th Percentile (6)	Range (7)
1. Local school tax rate (mills)							
1972-73	20.21	20.00	2.68	.132	1.22	1.53	5.7-29.0
1975-76	15.21	14.75	2.71	.180	1.26	1.75	3.7-22.0
2. Net operating costs (per pupil)							
1972-73	956	941	120	.126	1.23	1.42	670-1581
1975-76	1312	1290	167	.127	1.22	1.42	930-1970
3. Total state aid (per pupil)							
1972-73*	354	334	126	.358	1.77	3.15	138-867
1975-76	592	628	181	.305	1.41	3.60	80-1085
a. Categorical aid (per pupil)							
1972-73	43	42	14	.322	1.62	2.85	6-174
1975-76	65	62	26	.403	1.88	4.04	19-127
b. Flat grant aid (per pupil)							
1972-73	76	76	1	.013	1.01	1.02	33-80
c. Total equalization aid (per pupil)							
1972-73	170	139	126	.742	3.34	--	0-659
1975-76	527	533	180	.342	1.41	4.76	0-1048
4. Locally raised school revenue (per pupil)**							
1972-73	700	703	214	.305	1.20	2.94	100-1720
1975-76	811	770	295	.363	1.46	3.44	233-2147

*This total includes the $65 cost of social security and teacher retirement.

**These figures reflect local revenues to support total educational costs, not just net operating costs.

rate (Table 6, line 1). The average rate dropped 5 mills, from 20.21 to 15.21 mills. This compares with a reduction of almost 7 mills (from 28.43 to 21.69 mills) in the overall local tax rate, a decrease resulting from the fall in both school and nonschool tax rates.

The dispersion in local school tax rates over this period remained about the same as reflected by the standard deviation (col. 3), but it rose as measured by the coefficient of variation (col. 4). This reflects the sensitivity of the coefficient of variation to extreme values, and it contrasts with the interquartile range (col. 5) which shows no change. On the other hand, disparities appear in col. 6. It appears then that increased state funding for education reduced school tax rates by an equal absolute amount except at the upper and lower tails of the tax rate distributions. The relative dispersion appears to have increased but the evidence is by no means clear on this point.

Net Operating Costs

Net operating costs, as already noted, rose from $956 to $1312 per pupil in the space of three years (line 2). But, rather than observing a reduction in the dispersion--one of the aims of the reform legislation--we see that the absolute dispersion rose, as reflected by the standard deviation. The relative dispersion remained unchanged, as shown by the coefficient of variation. This comes as something of a surprise, given the view that power equalization, through reducing the impact of wealth differences, would

be expected to have had some effect in narrowing expenditure differences. However, no such effect is observed, as shown by the ratios of the 75th to 25th percentile and the 95th to 5th percentile.

Major Sources of Revenue

There are three principal sources for the funding of per pupil net operating costs: federal aid, state aid, and the local share. Federal aid to local school districts (not shown separately in Table 6) was of relatively minor consequence, accounting for about 5 percent of net operating costs in 1972-73 and 4 percent in 1975-76. Its dispersion changed little over the period, but even if it had changed significantly there could hardly have been much of any overall redistributive effect.

Total state aid per pupil (line 3) rose from 37 to 42 percent of net operating costs. It might have been expected to be distributed less equally after the reform, owing to the elimination of flat aids. Countering this tendency was a rise in the guaranteed valuation which made many more above-average wealth districts eligible for equalization aid. Although absolute differences as measured by the standard deviation did rise, the relative dispersion as measured by the coefficient of variation and the interquartile range actually decreased. However, the range and upper-lower tail disparity rose. To summarize, it appears that districts whose aid was minor in 1972-73 experienced the largest percentage gains in state aid; and high aid districts fared even better.

Locally raised education revenue (line 4) to finance net operating costs rose by only 16 percent with the dispersion

increasing by the absolute amount of the increase. The measures of relative dispersion also rise, as might be expected, because increased state aid made it possible for districts raising small amounts of revenue to hold the line on their own increases.

What do we conclude thus far? Though operating costs rose considerably, the relative dispersion of net operating costs showed no change of any consequence. State aid became more equally distributed, while locally raised revenue became in offsetting fashion more unequally distributed, as might be expected. This calls for a further exploration of the components of state aid.

Major Components of State Aid

The major components of state aid can be divided into equalization aid and nonequalization aid. Consider the latter first. Categorical state aid (line 3a), including its aid to handicapped children, showed an increase in dispersion, but its average increase from $43 to $65 per pupil makes it relatively unimportant in explaining changes in total state aid. (Teacher retirement benefits and employers' contributions to social security are not shown in Table 6. They were shifted into the shared cost category after 1972-73, totaled $99 and each showed less dispersion than categorical aids.) Flat aids (line 3b) provided in 1972-73 but discontinued thereafter obviously showed no change in dispersion. This leaves us with equalization aid (line 3c) which, as we observed before, displayed somewhat greater absolute dispersion but considerably less relative dispersion in 1975-76 than in 1972-73. The maximum equalization grant increased considerably. All of these are expected changes.

Conclusion

This initial examination of the results of the school finance reform indicates that it led to a sharp and significant infusion of state funds into educational finance. This was accompanied by a 25 percent reduction in local education tax rates. Although net operating costs per pupil rose substantially during the period, the relative dispersion of these costs remained unchanged. The absolute dispersion of total state aid rose substantially, much more so than the dispersion of local revenue to finance operating costs. The relative dispersion of state aid decreased (because low aid districts in 1972-73 had the biggest percentage gains), while that of local revenues increased.

VIII. DISTRIBUTIONAL EFFECTS

Our preliminary conclusion that the school finance reform had little effect, other than lowering property tax rates, must be reserved until we see who benefited from the reform. A probing assessment of its effects requires more than a cursory examination. Instead, we must determine how different groups of students and taxpayers were affected. Then we can see how the reform changed relationships intended to be changed and affected other relationships that were not intended to be changed.

Three dimensions are of special interest. One is the changes occurring for pupils classified by levels of property wealth where property wealth is assumed to show ability to pay. Another is the local school tax rate which reflects willingness to pay. A third

involves looking at the effects for students classified by average family income, another important dimension of ability to pay. An examination follows of the interaction of property wealth and education tax rate.

The distributional effects for students are classified into quintile groups for each of the key variables--property wealth, school tax rate, and family income. This is done by arraying the number of district pupils by the average values from lowest to highest for each district. The effect on pupils as compared to districts can be determined in this way. The array is divided into five groups or quintiles. The use of quintiles necessarily obscures some of the changes taking place at the extremes, changes which have often received undue attention in discussions of school finance reform. We prefer to focus on the broader effects of the reform.

How these effects were produced can be understood by examining an array of school-related data and noneducation data and then looking for any important linkages among these interrelated data.

Property Wealth

We have several expectations about the reform and the changes it produced on the distribution of pupils by property wealth quintile. First, we expect differences in net operating costs across quintiles to be narrowed. Second, the inverse relationship between state aid payments and property wealth levels should be heightened. Third, we anticipate greater relative reductions in school tax rates for lower property wealth quintiles. And finally, when the other sources of

noneducation state aid available to provide overall tax rate reductions are greater, we expect smaller reductions in school tax rates.

The basic data for this section appear in Table 7 which presents information on various aspects of finance for pupils classified by 1972-73 property wealth quintiles. Data on each of the variables are shown for both 1972-73 and 1975-76 by the 1972-73 property wealth quintiles. This mode of presentation helps to reveal not only the distribution effects of the school finance reform but also an understanding of these changes and their causes.

By definition, mean property wealth (line A1) differs by quintile when wealth is used as a ranking device, with the mean rising from about $25,000 to $53,000. By 1975-76 average property wealth had risen by about 50 percent. The percentage increases in wealth are inversely related to 1972-73 wealth levels, but the dollar gains are mildly correlated with initial wealth levels. As a consequence, considerable differences in average wealth remain among the quintiles in 1975-76.

Despite differences in "ability to pay" as measured by property wealth, average net operating costs (line A2) by property wealth quintiles were much more equal in 1972-73 than average wealth. Whereas the ratio of property wealth in the highest to lowest quintile exceeds 2, the similar ratio for net operating costs is 1.14. More important, the absolute increases in net operating costs from 1972-73 to 1975-76 were fairly uniform.[26] As a result, the range of

[26]The substantially higher enrollment decline in the fourth quintile (line B5) could account for the larger cost increase in the quintile since cost adjustments lag behind enrollemtn declines.

TABLE 7

WHO BENEFITED FROM THE REFORM: THE COMPOSITION OF SCHOOL FINANCE AND PROPERTY WEALTH

		1972-73 Distribution of Students by Quintiles of District Property Wealth				
		Lowest	Second	Middle	Fourth	Highest
A1. Property Wealth (equalized valuation per pupil)	a)+	$24,957	$33,050	$38,030	$41,285	$53,080
	b)	15,982	16,538	19,633	15,881	20,678
	c)	40,939	49,588	57,663	57,166	73,758
	d)	64%	50%	51%	38%	39%
A2. Net Operating Costs (per pupil)	a)	899	921	945	981	1,031
	b)	356	138	340	404	339
	c)	1,255	1,259	1,285	1,385	1,365
	d)	39%	37%	36%	41%	33%
A3. State Aid (per pupil)	a)	464	348	253	231	146
	b)	312	304	290	348	252
	c)	776	652	543	579	398
	d)	67%	87%	114%	150%	172%
a. Categorical Aid (per pupil)	a)	41	40	36	49	40
	b)	13	22	19	36	25
	c)	54	62	55	85	65
	d)	32%	55%	53%	73%	62%
b. Equalizing Aid (per pupil)	a)	347	232	142	107	29
	b)	374	357	339	384	289
	c)	721	589	481	492	319
	d)	67%	153%	238%	358%	996%
A4. Federal Aid (per pupil)	a)	44	34	35	62	35
	b)	13	16	4	25	11
	c)	57	50	39	37	46
	d)	29%	47%	11%	40%	31%
A5. Local Education Revenue (per pupil)	a)	458	608	734	748	956
	b)	99	92	129	111	133
	c)	551	700	863	859	1089
	d)	21%	15%	17%	15%	14%
A6. Local School Tax Rate (mills)	a)	20.44	20.18	19.31	21.38	19.31
	b)	6.09	5.62	4.76	4.37	4.08
	c)	14.35	14.54	14.55	17.01	15.26
	d)	-30%	-28%	-25%	-20%	-21%
B1. Total Local Revenue (per capita)	a)	180	229	275	263	281
	b)	-1	-18	-28	8	11
	c)	181	211	247	271	292
	d)	-	-8%	-10%	3%	4%
B2. Noneducation State Aid-Equalizing* (per capita)	a)	30	32	28	36	55
	b)	11	16	24	38	6
	c)	41	48	52	74	61
	d)	37%	50%	86%	105%	11%
B3. Noneducation State Aid-Categorical** (per capita)	a)	133	109	152	118	127
	b)	45	64	40	79	64
	c)	178	173	192	197	191
	d)	34%	59%	26%	67%	50%
B4. Total Local Tax Rate***(mills)	a)	26.73	27.00	26.03	34.47	26.03
	b)	8.26	7.03	5.87	7.05	4.55
	c)	18.47	19.98	20.16	27.42	21.48
	d)	-31%	-26%	-23%	-20%	-18%
B5. Enrollment		-1.4%	-3.6%	-1.5%	-11.1%	-1.9%

+a=mean 1972-73; b=dollar increase; c=mean 1975-76; d=percent increase.

*This includes the percentage of levies and general property tax relief.

**Includes all other state aid except as noted in footnote a.

***This is net of general and personal property tax relief.

net operating costs among the quintiles remained the same at roughly $130.

Total state aid (line A3) in 1972-73 was inversely related to average property wealth, reflecting the equalizing effects embodied in the prereform school finance legislation. Over half of net operating costs for the lowest wealth quintile were paid by state aid, as contrasted to less than one-sixth for the highest wealth quintile. However, the absolute increases in state aid over the period were roughly constant. This preserved but slightly reduced the preexisting inverse relationship between average property wealth and state aid. (In a relative sense, state aid became more equalized as shown by the pattern of percentage increases which clearly favored wealthier districts. However, it is the absolute differences that count, and these were not much different after the reform.)

We are not certain about the exact causes of this pattern but we will venture three possible explanations. First, per pupil property values grew faster in the low wealth quintiles relative to wealthier ones, implying some changes in state aid distribution even in the absence of legislative change. Second, and perhaps more important, the decision to raise the guarantee gives more equalization aid to districts and also increases the number of districts receiving equalization aid. That is, districts are poorer relative to the guaranteed evaluation, and more districts are considered relatively poor.[27] After

[27] For example, assume a prereform and postreform guarantee of $75,000 and $100,000, respectively. A $75,000 per pupil district would receive no aid prior to the reform and 25 percent aid afterward. A $50,000 district would have an aid level increase from 33 percent to 50 percent.

the reform, 96 percent of the pupils were in districts below the guarantee which was almost double the statewide average per pupil property valuation (see the negative aids section in Section IX). Third, as a matter of definition we did not consider flat aids to be equalization aid. Nevertheless, many districts would have received equalization aid (in amounts less than the flat aid level) if flat aid had not existed prior to the reform. Furthermore, by freeing up aid previously allocated to flat aids (including teacher retirement and social security payments paid by the state and valued at $141 in 1972--see Table 5), the guarantee level could be raised substantially without a new influx of state funds. On the other hand, districts which lost flat aid would have benefited from the increased guarantee, as noted above.

We see here that, while state aid may have a larger equalization component, changes in the definition of who qualifies for aid and for how much aid can counteract the expected equalizing effects of the formula. A small foundation program, even if poorly funded, clearly gives aid only to the poorest districts. But the state aid formula described in Table 7, which guarantees 96 percent of the districts the same tax base, gives "equalization" aid to almost every district.

The balance of net operating costs came from federal categorical aid (line A4) which was relatively small and locally-raised revenue (line A5), an obviously important source of revenue. The latter is, of course, positively related to property wealth, both before and after the reform. The pattern of increase is somewhat

erratic but can be characterized as generally independent of property wealth levels.

Additional information on local revenues is provided by the local school tax rate (line A6). These rates were surprisingly uniform by property wealth quintile in 1972-73. By 1975-76, the school tax rates fell in each quintile as additional aid was provided by the state; the largest declines were for the two lowest wealth quintiles. The postreform tax rates were still uniform--only 1.65 mills separated the quintiles.

The larger absolute and relative tax rate decreases in the lower wealth quintiles are difficult to explain. The rapid rise in property wealth values compared to net operating costs appears to account for most of the change. The effect of state aid increases appears to be minor by contrast; the same is true of equalizing aid (line A3). In addition, cost controls undoubtedly had some effect, as will be shown in Section X.

To complete this discussion, it is useful to consider the broader fiscal environment. Total local revenue per capita (line B1) displayed almost no change over the period, due largely to the provision of additional state aid (other than school aid). Some of the additional state aid was equalizing and some of it was not. Equalizing aid (line B2) was of relatively small magnitude, and categorical aid (line B3), though larger in magnitude, was distributed relatively evenly across the quintiles. These outside sources of funds, in combination with general and personal property tax relief, made it possible to lower total local tax rates which include education (line

B4). The greatest percentage and absolute declines occurred in the low property wealth quintiles. Here again we observe the response of low wealth areas to the availability of greater state aid--they are more likely to reduce their local tax effort.

Our tentative conclusion is that the apparent reductions in tax effort--for the schools and overall--in the face of greater state aid indicate two things: (a) local officials recognize and take advantage of the substitution possibilities or (b) school cost controls and municipal levy limits force local officials to substitute state aid for local revenues. Evidence presented in the next section indicates that cost controls definitely constrained most school districts from increasing expenditures.

It is worth noting that the fourth quintile starts with a well above average local education tax rate and experiences an exceptionally large decline. We cannot offer any explanation for this. It is also interesting to note that this quintile had by far the largest enrollment decline because it includes Milwaukee. This decline could explain the somewhat large increase in net operating costs.

Educational Tax Rate

We now repeat our analysis and base it on education tax rate quintiles. We take this approach since the school aids formula which is designed to minimize the influence of wealth disparities also had an effect on the distribution of school tax rates. It seems reasonable to believe that districts whose tax rates are high because of less property wealth will want to or be constrained to relax their

effort as more aid becomes available to them. But how much of a reduction will take place and the distribution of those reductions is not clear. The data needed to answer these questions are presented in Table 8.

Our first observation is that the highest taxed quintiles (line A1) in 1972-73 were also taxed most heavily in 1975-76. Over this same period there was a decline in the overall rate because of the state's increased funding for education. In fact, the mill rate declines are roughly proportional across quintiles.

Net operating costs (line A2) were greater in higher tax areas both before and after the reform. Increases in net operating costs among the quintiles since the reform were roughly proportional to the prereform levels, thereby accentuating the absolute dollar differences in spending. The difference between the highest and lowest spending quintiles went from $161 to $272, but most of this increase can be attributed to the sharp rise for the top quintile. This increase in net operating costs for the top quintile may be the result of its much more substantial enrollment decline (line B5) of almost 12 percent which assumes some lag in the ability to adjust to such delines. Again, Milwaukee is in this quintile. State aid (line A3) remained fairly equal across quintiles, both before and after the reform. The increases in categorical and equalization aid (lines A3a and A3b) were surprisingly uniform except for the lowest quintile. Since state aid and net operating expenditures are both relatively similar across quintiles, the absolute need for local education revenues (line A5) across quintiles was similar both before and after the reform.

TABLE 8

WHO BENEFITED FROM THE REFORM: THE COMPOSITION OF SCHOOL FINANCE AND LOCAL SCHOOL TAX RATE

		1972-73 Education Tax Rate Quintile				
		Lowest	Second	Middle	Fourth	Highest
A1. Local School Tax Rate (mills)	a)+	16.82	18.83	19.98	21.60	23.20
	b)	3.31	4.83	4.75	6.32	5.10
	c)	13.01	14.02	15.23	15.28	18.10
	d)	-23%	-26%	-24%	-29%	-22%
A2. Net Operating Cost	a)	880	885	959	970	1,061
	b)	335	336	343	343	426
	c)	1,215	1,221	1,302	1,313	1,487
	d)	38%	38%	36%	36%	40%
A3. State Aid	a)	259	299	276	326	288
	b)	257	324	308	321	310
	c)	516	623	589	647	593
	d)	99%	108%	111%	98%	108%
a. Categorical Aid	a)	38	42	43	37	47
	b)	14	21	28	19	31
	c)	52	63	71	36	79
	d)	37%	50%	65%	51%	66%
b. Equalization Aid	a)	145	181	156	212	165
	b)	312	381	351	375	344
	c)	457	562	507	587	509
	d)	215%	210%	225%	176%	208%
A4. Federal Aid	a)	37	40	41	37	57
	b)	10	11	13	10	25
	c)	47	51	54	47	32
	d)	27%	27%	32%	27%	44%
A5. Local Education Revenue	a)	641	608	729	695	798
	b)	108	75	82	79	100
	c)	794	683	811	774	967
	d)	17%	12%	11%	11%	13%
A6. Property Wealth (per pupil)	a)	40843	35292	40843	34806	38174
	b)	19435	15705	15686	17700	19288
	c)	60278	50997	56536	52506	57402
	d)	47%	45%	38%	50%	50%
B1. Total Local Revenues (per capita)	a)	224	207	247	229	303
	b)	0	-4	-6	-2	10
	c)	224	211	241	227	293
	d)	-	-2%	-2%	-	-3%
B2. Noneducation State Aid-Equalizing* (per capita)	a)	30	32	28	36	55
	b)	12	13	28	10	24
	c)	42	45	56	52	79
	d)	40%	40%	100%	44%	44%
B3. Noneducation State Aid-Categorical** (per capita)	a)	130	123	112	133	134
	b)	57	18	63	49	62
	c)	187	191	175	182	196
	d)	44%	15%	56%	37%	46%
B4. Total Local Tax Rate*** (mills)	a)	25.19	25.61	26.42	27.34	35.74
	b)	6.59	6.29	4.68	6.89	8.33
	c)	18.60	19.32	21.74	20.45	27.41
	d)	-26%	-25%	-18%	-25%	-23%
B5. Enrollment	d)	-.0	-1.6%	-3.0%	-1.3%	-11.7%

+a=mean 1972-73; b=dollar increase; c=mean 1975-76; d=percent increase.

*This includes the percentage of levies and general property tax relief.

**Includes all other state aid except as noted in footnote a.

***This is net of general and personal property tax relief.

The overall relationships between education tax rates and average property values (line A6) in 1972-73, 1975-76, and the increases over the interval, are not apparent; if anything, there are no relationships. This is important because of frequent statements about the association between high tax rates and low property wealth. The lack of relationships is similar to our finding in Table 7 where property wealth quintiles were employed.

The remainder of the local financial situation is captured in lines B1-B5. Total local revenue as well as equalizing and categorical state aid (lines B2 and B3) are rather evenly distributed both before and after the reform. Except for the top quintile which includes Milwaukee, local tax rates (line B4) are surprisingly similar. Decreases in local tax rates were roughly proportional, and combined with increases in state aid, local revenue per capita remained virtually unchanged over the three-year period.

We can summarize these results by indicating that little additional insight is gained by looking at the data from the vantage point of education tax rates. There is just too much similarity among tax rates to enable us to distill much from these data. This conclusion reinforces what we already discovered in the last section --namely, that education tax rates vary relatively little by property wealth.

Family Income

In Table 9 we present similar data but this time students are classified by the median family income of the school districts from which they come. The income data are for 1969 and hence reflect

TABLE 9

WHO BENEFITED FROM THE REFORM: THE COMPOSITION OF SCHOOL FINANCE AND MEDIAN FAMILY INCOME

		Income Quintile				
		Lowest	Second	Middle	Fourth	Highest
A1. Median Family Income, 1970		775	9367	10107	10629	12469
A2. Net Operating Costs (per pupil)	a)+	846	830	842	915	951
	b)	409	384	399	453	469
	c)	1255	1214	1241	1368	1420
	d)	48%	46%	47%	49%	49%
A3. State Aid	a)	397	291	225	269	245
	b)	260	311	367	322	184
	c)	657	602	592	591	429
	d)	65%	107%	163%	119%	75%
a. Categorical Aid	a)	43	44	41	46	33
	b)	14	15	25	34	23
	c)	57	59	66	80	57
	d)	32%	34%	61%	74%	70%
b. Equalization Aid	a)	277	172	108	147	137
	b)	335	380	417	371	276
	c)	612	352	525	518	413
	d)	120%	120%	386%	354%	201%
A4. Federal Aid	a)	54	39	37	54	25
	b)	12	8	9	25	9
	c)	66	47	46	79	34
	d)	22%	21%	24%	46%	36%
A5. Local Education Revenue	a)	513	637	716	724	892
	b)	132	67	31	102	192
	c)	645	704	747	826	1084
	d)	26%	10%	4%	14%	21%
A6. Local School Tax Rate (mills)	a)	19.08	18.88	19.11	21.29	21.45
	b)	5.73	4.82	4.81	4.57	4.99
	c)	13.35	14.06	14.30	16.72	16.46
	d)	30%	26%	25%	21%	23%
B1. Noneducation State Aid-Equalizing * (per capita)	a)	34	32	28	39	45
	b)	5	10	18	30	26
	c)	39	42	46	69	71
	d)	15%	31%	65%	77%	58%
B2. Noneducation State Aid-Categorical ** (per capita)	a)	157	117	105	113	137
	b)	40	60	68	81	44
	c)	197	177	173	194	181
	d)	25%	51%	65%	72%	32%
B3. Total Local Revenue (per capita)	a)	196	208	202	265	317
	b)	-8	7	19	-3	-22
	c)	192	215	221	262	295
	d)	4%	3%	9%	-1%	-7%
B4. Total Local Tax Rate *** (mills)	a)	25.71	24.74	25.04	33.29	28.85
	b)	8.45	5.53	3.35	7.70	5.98
	c)	17.26	19.21	21.59	25.59	22.87
	d)	-33%	-22%	-13%	-23%	-20%
B5. Enrollment	d)	-1.2%	-.5%	-10.6%	-4.1%	-3.0%

+a=mean 1972-73; b=dollar increase; c=mean 1975-76; d=percent increase.

*This includes the percentage of levies and general property tax relief.

**Includes all other state aid except as noted in footnote a.

***This is net of general and personal property tax relief.

values likely to be considerably lower than those for 1972-73 or 1975-76. Moreover, the one-time data preclude showing how changes in income may have been associated with changes in any of the other variables.

It is immediately obvious that although net operating costs (line A2) rise somewhat as income rises, they rise much less than income across quintiles. We do observe that state aid (line A3) in 1975-76 is inversely related to family income although the increases in aid bear little relationship to levels of income. This is also true for categorical aid (line A3a). Federal aid (line A4) does not appear to be targeted to lower income pupils. The association between average income and locally raised education revenue (line A5) increased by 1975-76 for all except the top quintile. Revenue actually fell there, notwithstanding its high property value per pupil. Finally, the absolute drop in the education tax rate was quite uniform except for the bottom quintile which experienced a bigger drop and ended with the lowest education tax rate.

We conclude from this exercise that across quintiles no major relationships emerge between the effects of school finance reform and average family income. Certainly none are apparent from these data.

Property Wealth and Education Tax Rates

An additional dimension of the reform's effect can perhaps be gained by viewing net operating costs and then state aid when pupils are classified simultaneously by property wealth and educational tax rate quintiles. We hope in this way to capture

whatever interaction may exist which did not show up in the one-way classifications. At the same time we recognize that this finer breakdown of the data is likely to increase the dispersion somewhat. Specific but unidentified factors will affect the distribution of districts in the various cells of our tables.

We have constructed a table to bring out the gross relationships. This required classifying pupils from the different school districts by both property wealth and education tax rate quintiles for the prereform year of 1972-73. The 1972-73 levels are entered on the first line; the third line contains the levels for these same pupil groups but in 1975-76; and the absolute and percentage changes are shown in the second and fourth lines. Our purpose is to give some idea of how the reform affected groups of students by following the changes they experienced.

We observe from Table 10, Panel A, that expenditure levels are, as expected, associated weakly with tax rate quintiles (read across the rows) and with property wealth quintiles (read down the columns). Once again, increases in expenditures since the reform appear to be roughly equal across the whole wealth-tax rate matrix. This reaffirms our earlier conclusion that the reform induced few changes in net operating cost.

While expenditure changes may have been quite uniform, this does not imply that state aid should necessarily have increased uniformly. In fact, as Panel B shows, the absolute increases in state aid tended to be lower for pupils in higher property wealth quintiles with lower school tax rates. Similarly, the absolute increases also

TABLE 10

WHO BENEFITED FROM THE REFORM: EFFORT VS. ABILITY TO PAY

1972-73 Property Wealth Quintile		1972-73 School Tax Rate Quintile				
		Lowest	Second	Middle	Fourth	Highest
A. Change in Net Operating Costs Per Pupil						
Lowest	a)*	785	775	824	879	932
	b)	407	416	393	415	456
	c)	1192	1191	1217	1294	1378
	d)	52%	54%	48%	46%	48%
Second	a)	715	810	864	922	979
	b)	363	380	409	396	365
	c)	1078	1190	1273	1318	1444
	d)	57%	47%	47%	43%	47%
Middle	a)	765	859	810	938	1042
	b)	397	392	376	325	431
	c)	1162	1251	1186	1363	1473
	d)	52%	46%	46%	46%	41%
Fourth	a)	787	806	819	898	990
	b)	379	423	384	330	553
	c)	1166	1229	1205	1328	1543
	d)	48%	52%	47%	48%	56%
Highest	a)	924	895	1001	929	1036
	b)	409	400	432	353	404
	c)	1333	1295	1433	1282	1440
	d)	44%	40%	43%	38%	39%
B. State Aid Per Pupil						
Lowest	a)	499	492	555	537	567
	b)	269	280	193	232	256
	c)	768	772	747	769	823
	d)	54%	57%	36%	43%	35%
Second	a)	356	405	428	385	456
	b)	243	254	281	195	150
	c)	599	659	699	580	606
	d)	68%	63%	63%	51%	33%
Middle	a)	312	329	325	347	263
	b)	273	235	248	234	131
	c)	585	564	598	581	394
	d)	87%	71%	84%	67%	49%
Fourth	a)	252	250	249	280	332
	b)	142	365	334	266	293
	c)	394	615	583	546	625
	d)	56%	146%	134%	95%	88%
Highest	a)	208	196	219	237	218
	b)	102	186	173	386	200
	c)	310	382	392	623	418
	d)	49%	95%	78%	163%	91%
C. Average Family Income						
Lowest		8244	3097	804	8523	10476
Second		9500	9408	10480	10181	12477
Middle		8391	9621	9780	11161	11806
Fourth		10358	10072	10605	10167	10264
Highest		9740	9869	11383	10335	14197

*a=mean 1972-73; b=dollar increase; c=mean 1975-76; d=percent increase.

seemed to be somewhat lower for high tax rate-lower property wealth pupils. But these are at best general tendencies and are only suggestive of what has happened.

There is little to be gained from displaying additional panels that cross classify some of the other variables discussed earlier. The results add little to the conclusions already drawn--namely, that increases in expenditures were relatively uniform on an absolute basis and increases in state aid per pupil were also rather equal on an absolute basis. There was some tendency for these increases to be smaller for children coming from higher wealth-lower tax rate and lower wealth-higher tax rate districts.

Whether these increases are related to property wealth and education tax rates is still not fully clear because, as Panel C indicates, average family income generally rises from the upper left-hand corner of the table down to the lower right-hand corner.

It is also evident that differences in per pupil school expenditures are far narrower than those implied by differences in property wealth, education tax rates, and average family incomes. The conventional views about how educational systems should be organized and operated, the minimum standards imposed by the state, and the operation of market forces make for considerable uniformity in spending patterns. Greater uniformity is unlikely to come except through increased state intervention and ever more complex formulas. However, the fraction of these costs paid by the state is subject to further manipulation at least in principle. But the increased sophistication of legislators and the rapid availability of computer

simulations of the effects of proposed changes in school aid formulas make it difficult to achieve agreement to make such changes. Those who are "hurt" know too quickly they will be hurt and so take counteraction. Perhaps that explains the general failure of the school reform to shift the pattern of state aid.

IX. PROGRAM EFFECTS OF THE REFORM

The 1973 reform and related legislation specified several program items not directly related to the equalization formula. Here we examine the effects of four provisions: (1) the changed financing of nonoperating costs, (2) cost controls, (3) negative aids and transition features, and (4) the 13 minimum education standards.

Nonoperating Costs

Nonoperating costs are the annual expenditures for debt levies and capital outlays. Differences in these costs among districts approximate differences in the quality of physical facilities available to students. Since the change in financing of nonoperating costs was an important part of the 1973 reform, we focus on this topic in Tables 11 and 12.

Prior to the reform, school districts financed all nonoperating costs. Since then, the state shares the first $100 of these costs according to the general aid formula. This means that the state now contributes $38 per pupil to the average school district; an average of $111 in local revenue is still needed to finance total nonoperating costs. Nonoperating costs in 1975-76 were $149, only $9 higher than net operating costs in 1972-73--a growth rate of 2 percent

TABLE 11

PROFILE OF NONOPERATING COSTS

	1972-73		1975-76	
	Local	State	Local	State
Mean	$ 140	-	$ 111	38
Median	130	-	99	38
Standard deviation	48	-	50	14
Coefficient of variation	.341	-	.437	.391
75th percentile/25th percentile	1.43	-	1.75	1.48
95th percentile/5th percentile		-		
Minimum	14	-	29	0
Maximum	389	-	363	72

TABLE 12

DISTRIBUTION OF NONOPERATING COSTS

Quintile Classified by:	1972-73 Quintile				
	Lowest	Second	Middle	Fourth	Highest
	(dollars per pupil)				
1. Property Wealth					
1972-73	$ 128	$ 134	$ 141	$ 126	$ 175
1975-76	136	146	161	143	171
Local Share	84	103	127	110	149
State Share	52	43	34	33	22
2. Education Tax Rate					
1972-73	118	124	154	153	150
1975-76	144	138	150	158	163
Local Share	109	96	114	117	132
State Share	35	42	36	41	31
3. Median Family Income					
1972-73	119	137	135	131	180
1975-76	128	145	147	142	191
Local Share	83	104	109	107	164
State Share	45	41	38	35	27

per year. New construction apparently stopped (perhaps due to declining enrollments), despite the influx of new state funding and the absence of cost controls on the financing of costs in this category.

Nonoperating costs are noticeably more dispersed in 1975-76, in contrast to the unchanged variation in net operating costs noted earlier. The absolute and relative dispersion of the local share increased, even though the average fell from $140 to $114. The coefficient of variation for the state's portion, .391, is greater than that for the state's portion of all shared costs, .342 (see Section VII).

The distribution of nonoperating costs shown in Table 12 indicates that high wealth, high tax rate, and high income school districts spent the most on facilities. This comes as no surprise. Nonoperating costs grew most in average wealth and low tax rate areas, and they grew uniformly in each income quintile. State aid was most plentiful in low wealth, low income districts, but low tax districts did not do much worse than mid and high wealth districts. In sum, low wealth, low tax, low income areas have slightly lower nonoperating costs and they have been decreasing somewhat since 1972-73. They now receive the most state aid.

Cost Controls

The general picture emerging from the earlier analysis is as follows: (1) the 1973 reform resulted in large, significant, and equitably distributed amounts of property tax relief, (2) there was no decrease in the relative dispersion of education expenditures, but

(3) there was a widening in the absolute dispersion. Cost controls immediately come to mind as a constraint on the ability of school districts to funnel additional state aid into education and property tax relief. We turn now to an examination of these effects.[28]

Annual percentage increases in average expenditures are shown in Table 13. In viewing this information, recall that in 1973-74 there was a $55 limit, in 1974-75 no limit existed, and in 1975-76 the limit was 9.5 percent of the prior year's expenditures. Also, some exemptions were allowed in both 1973-74 and again in 1975-76.[29] It is clear that the 7.3 percent average increase of $72 (based on average net operating costs of $956) more than exceeded the $55 limit. How much of this excess can be attributed to exemptions is unclear. When the controls were lifted in 1974-75, an unprecedented 14.8 percent increase of over $152 took place.

This sharp increase led to the reimposition of controls set at 9.5 percent for 1975-76. The percentage figure made more sense from the standpoint of local school districts faced with percentage increases in their costs. But it was inconsistent with the state government's objective of reducing the absolute dispersion in school costs, especially since high spending districts could add the most dollars. The actual increase for 1975-76 was 12.5 percent, reflecting once again a variety of exceptions which by this time had been written

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[28] Cost controls apply to shared costs minus the first $100 of net operating costs. Essentially, this is the net operating cost.

[29] The exemptions included transportation costs, expenditures needed to utilize new construction and the costs of implementing new state-mandated special education programs.

TABLE 13

PROFILE OF THE IMPACT OF COST CONTROLS ON NET OPERATING COSTS

	% Increase in Net Operating Costs		
	1973-74	1974-75	1975-76
Mean	7.3	14.8	12.5
Median	7.6	14.6	13.0
Standard Deviation	.422	.447	.351
Coefficient of Variation	.579	.301	.280
75th percentile/25th percentile	1.86	1.55	1.36
Minimum	-16.6	-1.9	-4.1
Maximum	27.9	34.4	33.1

TABLE 14

DISTRIBUTIONAL IMPACT OF COST CONTROLS ON NET OPERATING COSTS

Quintile Classified by:	1972-73 Quintile				
	Lowest	Second	Middle	Fourth	Highest
	(percent increase in net operating costs)				
1. Property Wealth					
1973-74	9.09	6.98	5.93	8.47	5.52
1974-75	15.22	14.58	15.17	16.21	12.88
1975-76	12.08	12.32	12.46	13.28	12.26
2. Education Tax Rate					
1973-74	7.61	7.79	6.59	7.38	7.16
1974-75	15.48	15.02	13.74	13.42	16.33
1975-76	12.42	12.11	12.93	12.02	12.89
3. Median Family Income					
1973-74	8.50	6.76	7.65	6.90	6.97
1974-75	15.24	13.78	14.01	16.36	15.81
1975-76	11.65	12.76	12.54	13.14	12.15
4. Poverty Status[a]					
1973-74	6.52	5.92	8.25	7.82	8.00
	12.93	14.82	14.49	14.81	16.64
	13.06	11.82	12.17	12.59	12.82

[a]Percent of population under 17 years of age living in a household below the federally determined poverty line.

into law. Nevertheless, the increase was significantly lower than in 1974-75 and in addition the dispersion decreased somewhat.

How did these increases vary across pupils classified by property wealth, education tax rate, and family income quintiles? Table 14 shows annual percentages rather than three-year percentage changes and does not reveal any consistent pattern except for the much more equal percentage increases among quintiles in 1975-76. Apparently, school districts have been increasing their expenditures as much as was permitted.

We conclude that cost controls have contained school expenditures by limiting what school districts can provide and what can be demanded of them. At the same time, the necessary exceptions required to accommodate local needs and state imposed programs pushed school costs beyond the control levels. This means that the percentage increase in costs allowed by the controls considerably understates actual increases in costs.

Negative Aids and Transition Features

The Wisconsin reform attracted considerable attention for its broad-reaching negative aid features. The Wisconsin Supreme Court's subsequent prohibition of these payments generated even more attention. It also produced concern about the ultimate effects of the reform.

How important would negative aids have been in altering the overall and distributional effects already described? We can answer this question by comparing our results in the absence of negative aids

with what would have resulted: (1) if negative aids had remained in effect but were implemented according to the negative aids transition provisions, and (2) if negative aids had gone into immediate effect in 1973-74 but had not altered any of the relationships observed in 1975-76 (expenditures, tax rates, etc.).

Negative aids, by changing the price of education in very wealthy districts, would alter behavior but, because the nature and magnitude of the responses are difficult to simulate, we present a first approximation of the effects. This assumes that spending behavior would not have changed.

The impact of negative aids and the impact of their rejection by the court are shown in Table 15. Three situations are portrayed: (1) a hypothetical situation in which negative aids would have been in full operation in 1975-76 (no transition provisions would have applied); (2) the situation that prevailed during 1975-76 when negative aids were calculated; and (3) the actual financial situation for 1975-76 after the court's ruling when negative aids no longer applied. It should be noted that the transition features of the 1973 legislation did not require primary negative aid payments until 1976-77. In addition, 70 percent of any aid loss by district compared to 1972-73 was still paid by the state in 1975-76. This latter form of aid is labeled transition aid in Table 15.

The legal ruling (compare lines 1a and 1b, 2a and 2b, etc.) did not affect average primary aid payments in 1975-76. Without the transition features (line 1c) the impact of negative aids would not have been large from a statewide perspective, although a few school

TABLE 15

EFFECT OF NEGATIVE AIDS AND TRANSITION FEATURES, 1975-76

	Dollars per Pupil		Standard	Coefficient of			% of Pupils In Districts Paying
	Mean	Median	Deviation	Variation	Minimum	Maximum	Negative Amounts
1. Primary Aid							
a. With negative aids	507	533	237	.468	-1906	1027	3.8
b. With negative aids-transition delay	520	533	189	.364	0	1048	0
c. Without negative aids: current status	520	533	180	.342	0	1048	0
2. Secondary Aid							
a. With negative aids	-16	0	97	5.94	-999	223	27.5
b. With negative aids-transition delay	-16	0	97	5.94	-999	223	27.5
c. Without negative aids: current status	3	0	17	5.41	0	223	0
3. Transition Aid							
a. With negative aids	-	-	-	-	-	-	-
b. With negative aids-transition delay	16	0	78	4.90	-8	848	-
c. Without negative aids: current status	4	0	20	5.14	0	148	-
4. Total Equalization Aid							
a. With negative aids	491	532	309	.629	-2589	1048	4.2
b. With negative aids-transition delay	522	536	190	.364	-999	1048	3.6
c. Without negative aids: current status	527	533	183	.342	0	1048	-

districts would have been significantly affected. Primary aid falls by $13 per pupil on average and reflects the overall size or fiscal impact of negative aid payments. As expected, the dispersion of state aid would have increased. The wealthiest district would have paid $1906 per pupil to the state treasury. Interestingly, only 3.8 percent of students belonged to school districts that would have been affected by primary negative aid.

Positive secondary aid averaged only $3 per pupil in 1975-76. In the absence of the court decision, the negative secondary aid provision would have applied to school districts having 27.5 percent of the state's enrollment and would have required the payment of an average of $16 per pupil for redistribution by the state. The $16 per pupil statewide fiscal impact is about the same as the $13 impact of primary negative aid ($520-$507). It should be recalled that districts subject to secondary negative aids had to have property valuations exceeding the state average and had to spend in excess of the prior year's statewide average expenditure by 10 percent.

Prior to the court's ruling, transition aid of $4 per pupil almost balanced secondary aid, and virtually no pupils would have been in districts receiving less aid than in 1972-73. While 70 percent of the state aid loss according to the formula was still covered by the state, this transition aid did not amount to much--$4 per pupil statewide. This is why the transition features do not severely distort our evaluation which uses 1975-76 data.

Total equalization aid (line 4) shows that most districts which would have paid negative secondary aids received larger amounts

of positive primary aid. Although only 4.2 percent of students attend schools that would have had to make payments to the state, these payments would have ranged up to $2600 per pupil.

The distribution effects of negative and transition aids are summarized in Table 16 which shows how state equalization aid changes under the three situations just discussed, i.e., when pupils are classified by property wealth, education tax rate, and income quintiles. The basic levels of equalization aid are shown under primary aid. Changes in secondary aid and then in transition aid would add or subtract to the equalization aid shown under primary aid.

Consider first the distribution effects by property wealth quintiles in Table 16. Equalization aid was unaffected by the court's decision on negative aids because the primary negative aids program had not yet taken effect (compare lines 1a and 1b). Even with immediate implementation of primary negative aids (line 1c), only the top quintile would have been affected, with its equalization aid reduced from $317 to $260 per pupil. This reaffirms the earlier conclusion that the impact of primary aid would be confined to high property wealth districts and would affect only a small proportion of students in those districts.

Secondary aids which had already gone into effect increased equalization aid on average in all wealth quintiles (line 2a). Had the court not reached the decision it did, the highest wealth quintile would have lost slightly more in secondary aids (-$71) than in primary aids ($317-$260). Of course, no difference results from the timing of the implementation of secondary aids (line 2c).

TABLE 16

DISTRIBUTIONAL EFFECTS OF NEGATIVE AIDS AND TRANSITION FEATURES, 1975-76

	1975-76 Quintile			
	Lowest	Second	Middle	Fourth
A. Property Wealth				
1. Primary Aid				
a. With negative aids	$ 715	$ 587	$ 477	$ 494
b. With negative aids-transition delay	715	587	477	494
c. Without negative aids: current status	715	587	477	494
2. Secondary Aid				
a. With negative aids	6	-1	-16	-3
b. With negative aids-transition delay	6	-1	-16	-3
c. With negative aids: current status	7	3	0	0
3. Transition Aid				
a. With negative aids	–	–	–	–
b. With negative aids-transition delay	0	2	20	0
c. Without negative aids: current status	0	0	10	0
B. School Tax Rate				
1. Primary Aid				
a. With negative aids	$ 408	$ 556	$ 498	$ 587
b. With negative aids-transition delay	452	556	510	587
c. Without negative aids: current status	452	556	510	587
2. Secondary Aid				
a. With negative aids	-30	0	-34	-3
b. With negative aids-transition delay	-30	0	-34	-3
c. With negative aids: current status	1	3	3	3
3. Transition Aid				
a. With negative aids	–	–	–	–
b. With negative aids-transition delay	33	5	23	3
c. Without negative aids: current status	11	1	0	0
C. Family Income				
1. Primary Aid				
a. With negative aids	$ 581	$ 539	$ 525	$ 505
b. With negative aids-transition delay	605	541	525	518
c. Without negative aids: current status	605	541	525	518
2. Secondary Aid				
a. With negative aids	-9	2	-0	-12
b. With negative aids-transition delay	-9	2	-0	-12
c. Without negative aids: current status	4	5	0	1
3. Transition Aid				
a. With negative aids	–	–	–	–
b. With negative aids-transition delay	14	9	0	16
c. Without negative aids: current status	4	1	0	5

Transition aids are relatively minor but if negative aids had not been ruled unconstitutional, the middle and highest quintiles would have gained considerably, in order to help them adjust to changes in primary and secondary aids.

The effects by education tax rate quintiles can be read in the same way from the middle panel of Table 16. However, the effects are more diffused because of the less than perfect association between property wealth and education tax rates. For example, immediate implementation of negative aids (compare lines 1c and 1b) would have reduced aid the most for pupils in the lowest tax rate quintile, with much smaller effects on the middle and highest quintiles, and no effect on the second and fourth quintiles. Negative secondary aids were substantially affected by the court decision for the lowest, middle, and highest quintiles (lines 2a and 2b). Once again, the presence of some high property wealth districts within these quintiles produces the observed effects. Finally, the court decision caused transition aid to drop relative to what it would have been for all quintiles, since the purpose of transition aid was to offset the full effect of negative secondary aids.

The effects by family income quintiles yield the same mixed pattern, again because each income quintile contains a range of property wealth values. Primary negative aid would have produced the greatest absolute reductions in equalization aid for the lowest and highest income quintiles, followed by the next quintiles. There would have been no change whatsoever for the middle quintile. The story is somewhat different for secondary aids. The court decision

was most important to the highest income quintile, relieving it of the need to make large secondary aid payments to the state. The lowest and fourth quintiles also gained but not as much. The effect of transition aid by income quintile varied, being highest for the top income quintile. In the absence of the court decision, these transition aids would have offset the effect of negative primary and secondary aids.

From this we conclude that the court decision had a major impact. It caused an immediate reduction in negative secondary aid payments in high wealth districts, where tax rates range widely over the spectrum of tax rates and where incomes tend to be among the highest or the lowest observed. More important, perhaps, is the obvious fact that negative primary aids were directed at an exceptionally small proportion of the state's school districts. Negative secondary aids would have had as large an effect as negative primary aids but they would not have been concentrated on high property wealth districts.

The 13 Minimum Educational Standards

The importance of the 13 minimum educational standards to the passage of the 1973 reform is unknown. The standards do, however, help assure some measure of educational quality--at least in terms of the availability of various kinds of instructional services. In this section we want to determine whether or not the quality of curriculum and facilities in districts is related to school finance variables and changes in them over the 1972-73 to 1975-76 period.

The data used for this exploration come from a sample of 110 school districts enrolling about a third of the state's students. This sample represents the school districts actually audited by the Department of Public Instruction in 1976-77. For the remaining school districts and for other years, the only data available are based on self-reported information. Most of the DPI sample, stratified by school size, is random. Since about 20 percent of the districts were intentionally audited, the applicability of the following results to the entire population should be treated cautiously. Another caveat is that many of the standards contain several subcomponents. If one subcomponent is not complied with, the whole standard is considered in noncompliance. If each component were considered a separate standard, the results obtained might differ from those we present here. Moreover, the meaning of compliance is difficult to assess because of the vagueness of some of the standards. For example, there was frequent disagreement between the district and DPI reviewers as to whether compliance existed.

The first line of Table 17 shows the distribution of students in the sample by the number of standards their school districts had met. Milwaukee had met seven standards, explaining the large number of students in that column. Only 8,000 students--less than 3 percent--were in districts complying with all 13 standards. Less than 50 percent of the students were in districts complying with even nine of the 13 standards!

Generally, net operating costs, and their percentage increases whether before or after the reform, appear to be unrelated to the

TABLE 17

SCHOOL FINANCE VARIABLES AND THE ATTAINMENT OF THE 13 MINIMUM EDUCATIONAL STANDARDS

	Number of Educational Standards Complied With in 1976-77							
	6 or less	7	8	9	10	11	12	13
Number of pupils, 1975-76	20,623	120,294	28,031	47,973	28,161	16,329	26,082	8,059
Cumulative percent of pupils	100.0	93.2	55.5	46.0	37.5	18.8	10.5	2.7
Net Operating Cost								
1972-73	804	975	848	848	843	795	875	822
1975-76	1195	1505	1265	1231	1226	1191	1276	1197
Property Value								
1972-73	34,265	39,757	34,420	42,947	35,636	37,567	35,107	37,228
1975-76	45,346	55,834	53,817	59,251	51,562	55,481	52,268	54,360
Educational Tax (mills)								
1972-73	18.45	22.54	19.57	19.66	19.91	18.41	20.22	20.45
1975-76	13.45	18.98	14.92	13.40	14.28	14.03	14.18	14.75
Total State Aid								
1972-73	313	273	305	210	311	271	311	234
1975-76	693	634	632	598	577	548	605	533
Minimum Standards Met Self Evaluation								
1973-74	11.43	10.81	10.76	12.28	10.73	11.07	12.76	12.35
1976-77	11.84	12.91	11.86	12.09	12.11	12.68	12.08	10.26

attainment of the standards. Property values also bear little or no relationship to the number of standards met. Neither do levels and changes in the school tax rates. However, it appears that in 1975-76 districts meeting fewer standards got slightly above average state aid!

Perhaps the most interesting entry is the comparison between the standards complied with according to the self evaluation and according to the DPI audit. We would expect districts that actually met fewer standards to evaluate themselves more favorably than the audit, with less overstatement by districts actually meeting more standards. This is the case but more surprising is the fact that low compliance districts rated themselves as high as high compliance districts in both 1973-74 and 1976-77. The results for 1973-74 are not too unexpected since the administrative rules were still being worked out. By 1976-77 the administrative rules were not only established but every district knew it had a 25 percent chance of being audited. Still, this made little difference in the accuracy of self evaluation.

X. SUMMARY AND CONCLUSIONS

Summary

Our study of the effects of the 1973 school finance reform and related legislation reveals that the goals of the reform were more ambitious than the mechanisms created to assure their attainment. The Wisconsin legislation sought to institute property tax relief, narrow disparities in educational expenditures, enhance the quality of the schools, and yet not weaken local control over schools. The

principal mechanisms chosen to attain these not necessarily compatible objectives involved raising the guaranteed tax base while requiring the few districts having tax bases larger than the guarantee to pay "negative aids" to the state. Local districts could still choose their tax rate. However, expenditure increases for all districts were constrained by "cost controls."

It is certainly true that the reform did afford substantial tax relief by increasing the state share of funding from 30 to 40 percent of total costs. The school tax rate fell by well over 5 mills. The dispersion in per pupil school expenditures widened absolutely but remained unchanged relatively--that is, expenditures grew proportionately among districts but the dollar gap widened. Thus, the goal of narrowing disparities in spending was not achieved.

When the distribution effects are analyzed in detail there is little clear evidence that the low wealth, low income, high tax burden districts benefited from the reform to a greater extent than did other districts. To begin with, the prereform school finance situation in Wisconsin was not as bad as California was portrayed in the Serrano decision or as the plaintiffs argued in the Rodriguez case. Net operating costs in the lowest property wealth quintile were only $130 lower than in the highest quintile. The high wealth quintile had a mean school tax rate only 1 mill lower than the poorest wealth quintile. Furthermore, our findings showed that the high tax districts generally spend more, not less. And while high income districts did spend more, income could not be associated with property wealth or the tax rate in any consistent fashion.

The distributional changes brought about by the reform seem to have affected only a few districts. The highest wealth, lowest tax, and highest income quintiles did receive smaller state aid increases. However, the other four quintiles in each of these categories benefited about equally, and expenditure changes could not be predictably related to any of the variables we studied. Only in the school tax rate relationship could we definitely say that the school tax reductions increased consistently as wealth declined.

The effects we turned up regarding particular features of the reform provided some surprises. Cost controls appear to have not only constrained increases in expenditures but also operated to ensure uniform cost increases, thereby preventing low cost school districts from narrowing the differences in expenditures. The impact of negative aids, which were subsequently nullified by court action, would not have significantly affected the vast majority of school districts, and their impact would have been minimal in redirecting state aid to more "deserving" areas. The imposition of the 13 minimum standards could not have had much effect because the standards are yet to be enforced; this suggests that the weaker standards under the old law may also have been ineffective. Furthermore, none of the school finance variables including expenditures could be effectively related to actual compliance with the standards.

In summary, the claims made for the 1973 school finance reform are not supported by any evidence that the desired effects of the reform have resulted--at least not in the three year period covered by our study. The only tangible outcome was general property tax relief.

Conclusions

Not having found the effects we expected, what concluding observations can we offer?

There may have been too much concern with equalizing expenditures rather than with enhancing the effectiveness of the resources allocated to the schools. Equal expenditures are seen as a step toward greater equality, on the unstated assumption that equal expenditures are more likely to produce equal results. But whether this assumption has validity is not clear. Despite the weaknesses of our study of the 13 minimum educational standards, two conclusions emerge. Compliance could not be successfully related to expenditures, or any other variables. And the self evaluation of school districts could not predict the compliance actually found by the state agency's audit. Admittedly, the 13 standards relate to educational "access" rather than student performance, but our findings illustrate the weak link between equalizing expenditures and equalizing some measure of what schools do.

By having concentrated so much attention on equalizing expenditures, less attention has been given to narrowing the differences in student performance and accomplishment. On the other hand, the objective of equalizing expenditures, even with all the shortcomings just noted, seems to have not been pursued seriously. Cost controls, while not entirely to blame, have played an important part in preventing low spending districts from "catching up." We recognize the stratagem of cost controls but believe that at the very least an annual dollar limit, such as $100, is preferable to the percentage

limitation. Better yet, low spending districts would have a much higher cost limitation than high spending districts. In addition, an incentive to increase expenditures in low spending districts (e.g., those with net operating costs 10 percent below the prior year's state average) could be built into the formula in much the same way as secondary aids help constrain high cost districts.

Much of the effort on school finance reform appears to have involved an effort at "fine tuning" the mechanisms for allocating state aid. Whether such fine tuning can work is not clear. In fact, we found the prereform school finance situation to be considerably better than we might have expected it to be. Despite the complex of precisely written legislation based on indexes, percentages, averages, etc., the prereform relationships have hardly changed. As a consequence, we think that more attention should be paid to continuous monitoring of the actual effects of legislation, recording the responses of school districts, and relating state initiatives in school finance to standards of access and performance.

Whatever our conclusion, the nature of the political process makes it unlikely that the subject of reform will come up again for a few years. The break gives everyone an opportunity to deliberate carefully on the directions that future reform proposals, if there are to be any, should take. We hope that the results of this evaluation will contribute to those deliberations.

APPENDIX--Section VI

SOURCES AND DEFINITIONS OF DATA

Variables	Year	Definitions	Sources
Enrollment	1972, 1975	Pupils	Planning for Better Education in Wisconsin, 1972-73 (and subsequent years), Wisconsin Department of Public Instruction
Property wealth	1972, 1975	Equalized valuation per pupil	
Net operating cost	1972, 1975	Dollars per pupil	
Education Tax Rate	1972, 1975	Mills (tax rate for current operations only)	
Percent high school students	1972, 1975	H.S. enrollment/total enrollment	
Nonshared costs	1972	(Total tax rate-current operations tax rate) X (per pupil property valuation)	
Pupil density	1975	Enrollment/square miles in school district	
Percent increase in net operating costs	1972-73 1973-74 1974-75	(Net operating costs, current year) - (Net operating costs, prior year) / net operating costs, prior year	
Categorical Aid	1972, 1975	Total state aid--flat and equalization aid	Distribution of State Aid Dollars, 1972-73 (and subsequent years) Wisconsin Dept. of Public Instruction
Equalization aid	1972	Flat and equalization aid - flat aid	
Transportation aid	1972, 1975		
Aid for handicapped children	1972, 1975		

Variables	Year	Definitions	Sources
Federal aid	1972	Total state and federal aid - total state aid	Federal Aids Paid to School Districts, 1972-73 (computer listing by county on file at DPI). Federal Aids Paid to School Districts, 1975-76 (mimeo), Department of Public Instruction
Federal aid	1975		
Title I aid	1972, 1975		
Nonshared costs	1975		Reprint of Alternative Computations of State Aid in 1975-76 Using Income as a Measure of School District Wealth, Sept. 22, 1976, Wisconsin Legislative Council Staff Memorandum, 76-27
Nonoperating costs	1975	Nonshared costs + $100	
Secondary costs	1975		
Transition aid	1975		
Primary Aid	1975		
Equalization aid	1975	Primary + secondary + transition aids	
School district population	1969		1970 Census (translated from census units in the first count tabulations into school district terms by the Bureau of the Census and the National Center for Educational Statistics). Loaned by the Research and Development Center for Cognitive Learning, Univ. of Wisconsin
School age population	1969	Population between the ages of 5 and 17	
Median family income	1969		
Poverty status	1969	Percentage of school age population living in families below the federally defined poverty level	
Educational attainment	1969	Average number of years of school completed by school district residents	

Variables	Year	Definitions	Sources
Employers contribution to:			Computer tabulation, 1975; tabulation by hand, 1972; Department of Public Instruction
Teacher retirement	1972, 1975		
Social Security	1972, 1975		
Percent of students in private schools	1972, 1975		Computer tabulation, Department of Public Instruction
Compliance with minimum standards:			Mimeographed material provided by Department of Public Instruction
Self-evaluation		1 to 13 depending on the number of standards complied with	
DPI Audit			
Total local revenue	1972, 1975	Local property tax levies net of general property tax relief	Taxes Aids and Shared Taxes in Wisconsin Municipalities, 1972 Wisconsin Department of Revenue, 1974, Bureau of Local Fiscal Information and Analysis
Total local tax rate	1972, 1975	Local property tax levies net of general and personal property tax relief / (population X equalized property value per capita)	
Noneducation:			A data tape containing information similar to the 1975 version of this document was used to get the 1975 data
Equalization aid	1972, 1975	Percentage of levies and general property tax relief	
Categorical aid	1972, 1975	Natural resource aid Transportation aid Special Utility Per Capita aid Miscellaneous aid Personal property tax relief Payments to counties	

Variables	Year	Definitions	Sources
Flat aid	1972	$88 per H.S. pupil $70 per elementary pupil	Calculations by the authors
Secondary aid (after the court decision)	1975	Set all negative amounts of aid to zero	
Transition aid (after the court decision)	1975	Subtract all negative secondary aid; cannot be negative	

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