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ABSTRACT

Indiana public policy has frozen local property tax levies for public education funding since the early 1970s, which has resulted in an educational system largely supported by state fiscal aid. A statistical analysis of the fiscal equity of Indiana's school operating expenditures for the latest school year preceding the freeze (1972-73) and the latest available school year (1985-86) is presented in this paper. School operating expenditures for 303 public school districts are analyzed according to two variables: horizontal equity and fiscal neutrality. A conclusion is that despite increased state support, costs paid by local taxing districts have contributed to inequitable school operating expenditures. A relationship exists between taxing district operating expenditures per student and tax rate, between school operating expenditures per pupil and assessed valuation, and between taxing district tax rate and assessed valuation. The recommendation is made for study of public policy on a state-by-state basis. Nine statistical tables are included. (LMI)

INDIANA SCHOOL FINANCE EQUITY

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EQUITY IN INDIANA SCHOOL FINANCE: A DECADE OF LOCAL LEVY PROPERTY TAX RESTRICTIONS

by

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Introduction

Indiana is somewhat unique in financing public education in that it has engaged in the public policy of freezing local property tax levies for funding public education since the early 1970s. Thus, one could suggest that Indiana preceded California by a decade with its own version of Proposition 13. Over time, the state has dramatically increased its share toward funding public education. Thus, in theory, if the state share were rising faster than the local share, it should indicate greater fiscal equity. However, to assume such a simplistic view may be erroneous due to the complexities of various formulas. This article examines this relationship in a state that has greatly retarded local revenues. Thus, during this period of time, Indiana has emerged from a relatively low to a relatively high state fiscally supported public educational system.

Changing any school finance scheme to one that is fair to both students and taxpayers is complicated by varying factors over time. Indiana has attempted to satisfy educators, who have sought more revenue to fund programs, and taxpayers, particularly agricultural interests, that sought to lower property tax rates, by revising school finance distribution schemes based on a program of severely restricting the growth of the local school tax levy.[1]

Since 1973, Indiana has had in effect a freeze on the ability of local educational agencies to increase the local property tax levy beyond 1973 limitations. Thus, over time, the state has assumed the vast majority of the increased costs of public education. Since the property tax freeze of 1973, Indiana has increased overall state aid from 34.4

1. See, R. Craig Wood and Robert W. Ruch, "A Reexamination of Capital Outlay Distribution in Indiana," Journal of Education Finance, 13 (Winter 1988) 240-252; R. Craig Wood and Robert W. Ruch, "A Model for Distributing Capital Outlay Funds in Indiana," Planning & Changing, (Fall 1986): 165-179.

percent of revenues in 1973 to 62.2 percent in 1986.[2] Since the enactment of the property levy freeze, Indiana's funding scheme has been modified by including such items as supplemental grants, increasing the foundation dollar amounts, and including weighted-pupil computations.[3]

From 1973 to 1985, the years of the study, the general fund formula was essentially as follows:

Prior Year's State Basic Grant + Prior year's Maximum Normal Property Tax Levy + Additional State Guarantee - Current Year's Maximum Normal Property Tax Levy = State Aid

Within this formula, the definition, as well as the manner of operation of the Current Year's Maximum Normal Property Tax Levy drives the amount of increased state aid. During this period of time, the local levy was simply the prior years levy.[4] Thus, over time, the local fiscal share to support education was essentially halted.

Specifically, this article examines and analyzes the fiscal equity of Indiana's school operating expenditures. For the purposes of this examination, operating expenditures were defined as total expenditures excluding capital outlay, debt retirement, and federal programs. The study excluded capital outlay, debt retirement, and federal program expenditures from total expenditures.[5]

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2. Figures based on an analysis of Report of Statistical Information for Indian School Corporations, annual reports, (Indianapolis: Indiana Department of Education).

3. Richard E. Byron, "Equalization of Educational Opportunity in Indiana," Journal of Education Finance, 4 (Spring 1978): 432.

4. Slight adjustments occurred over time within the formula, i.e., 1979-Prior year's levy plus 1 percent of the general fund budget plus an additional 6 percent increase if granted; 1982-The 1981 rate applied to the 1982 adjusted assessed valuation plus an optional transfer of 15 cents from the cumulative building fund rate to the general fund rate; 1983-Prior year's levy plus a transfer from the cumulative building fund of an amount equal to 7 percent of the 1982 utility costs, and; 1984-An increase of the prior year's levy equal to the average percentage increase in the highest three of the previous five years' increases in the adjusted assessed valuation.

5. Operating expenditures were determined in this manner since each of these categories were considered non-operating expenditures. Summer school and amounts reported under special programs separated from other programs in the 1985-

By examining and analyzing Indiana school corporations' (school districts) operating expenditures over time, the fiscal equity of the public school operating expenditures were assessed. The objectives of this article were to examine and analyze the fiscal equity of Indiana's public school operating expenditures for the latest school year preceding the tax levy freeze (1972-73) and the latest available school year (1985-86). This study limits examination of school operating expenditures to the horizontal equity component of fiscal equity and fiscal neutrality for both students and taxpayers.

School operating expenditures per pupil were chosen as the variable (object) for the horizontal section of the article. The fiscal neutrality variables selected for the article were the following: (1) the school operating expenditures per school ADA as the dependent variable and the adjusted assessed valuation per resident ADA as the explanatory variable, (2) the school operating expenditure per school ADA as the dependent variable and the adjusted general tax rate as the explanatory variable, and (3) the adjusted general tax rate as the dependent variable and the adjusted assessed valuation per resident ADA as the explanatory variable.

The subjects of the examination included all the public school corporations in Indiana.[6] The 303 school corporations chosen for the examination included 309 taxing districts for the 1972-73 school year.[7] The number of taxing districts for the 303 public school corporations in Indiana for the 1985-86 school year numbered 301.

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86 school year and other programs were considered operating expenditures. Special programs were expenditures from food services, community services, instruction, and other categorized expenditures e.g., special education and vocational education.

6. Two public school corporations were excluded. One corporation bused their students to another school corporation in the 1972-73 school year and in the 1985-86 school year and did not have any school average daily attendance (ADA) for the school years examined. Another corporation bused their students to another school corporation in the 1985-86 school year and did not have any school ADA for 1985-86 school year.

7. The differences in the number of taxing districts was a result of one school corporation having seven taxing districts; two school corporations located in one county having a combined taxing district; and one school corporation having two taxing districts.

Horizontal Equity Presentations

The boxplots present an overall graphic display of the variability of the school operating expenses. The variability between the 1972-73 school year and the 1985-86 school year increased for the 1985-86 school year. Taken as a whole, a widening of the quartiles represent a lessening of horizontal fiscal equity. In the school year 1972-73, there were three school corporations that had operating expenditures outside 1.5 times the interquartile range of $169.24.

However for the school year 1985-86, at the higher end there were eleven school corporations above the 1.5 times the interquartile range of $650.50. There were no school corporations outside 1.5 times the interquartile range on the lower end for the school year 1985-86. Data from the boxplot can be interpreted as the 1985-86 school operating expenditures being less fiscally equitable when compared to the 1972-73. Not only does the variability appear to increase but the magnitude above the median appears to have grown.

Lorenz Curve

The Lorenz curve, Figure 2 for the 1972-73 school year and for the 1985-86 school year, graphically represents the percent of pupils on the x-axis and the school operating expenditures on the y-axis. The Lorenz curves for the 1972-73 school year and the 1985-86 school year appear to be similar. Upon close examination, the Lorenz curve for the 1972-73 is closer to the 45 degree line. Therefore, the 1972-73 school operating expenditures are slightly more equitable.

Federal Range Ratio

A federal range ratio of no more than 25 percent would imply that the school operating expenditures would be equitable.[8] The federal range ratio is summarized in Table 1. Neither the 1972-73 school operating expenses nor the 1985-86 school operating expenses are equitable. The increase in the ratio from .5021 for the 1972-73 school year to .8471 indicates that the fiscal equity of the school operating expenses have decreased considerably.

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8. 41 Fed. Reg. 26320 (1976).

FIGURE 1.

BOXPLOTS OF SCHOOL OPERATING EXPENDITURES IN INDIANA

FOR THE SCHOOL YEARS 1972-73 AND 1985-86

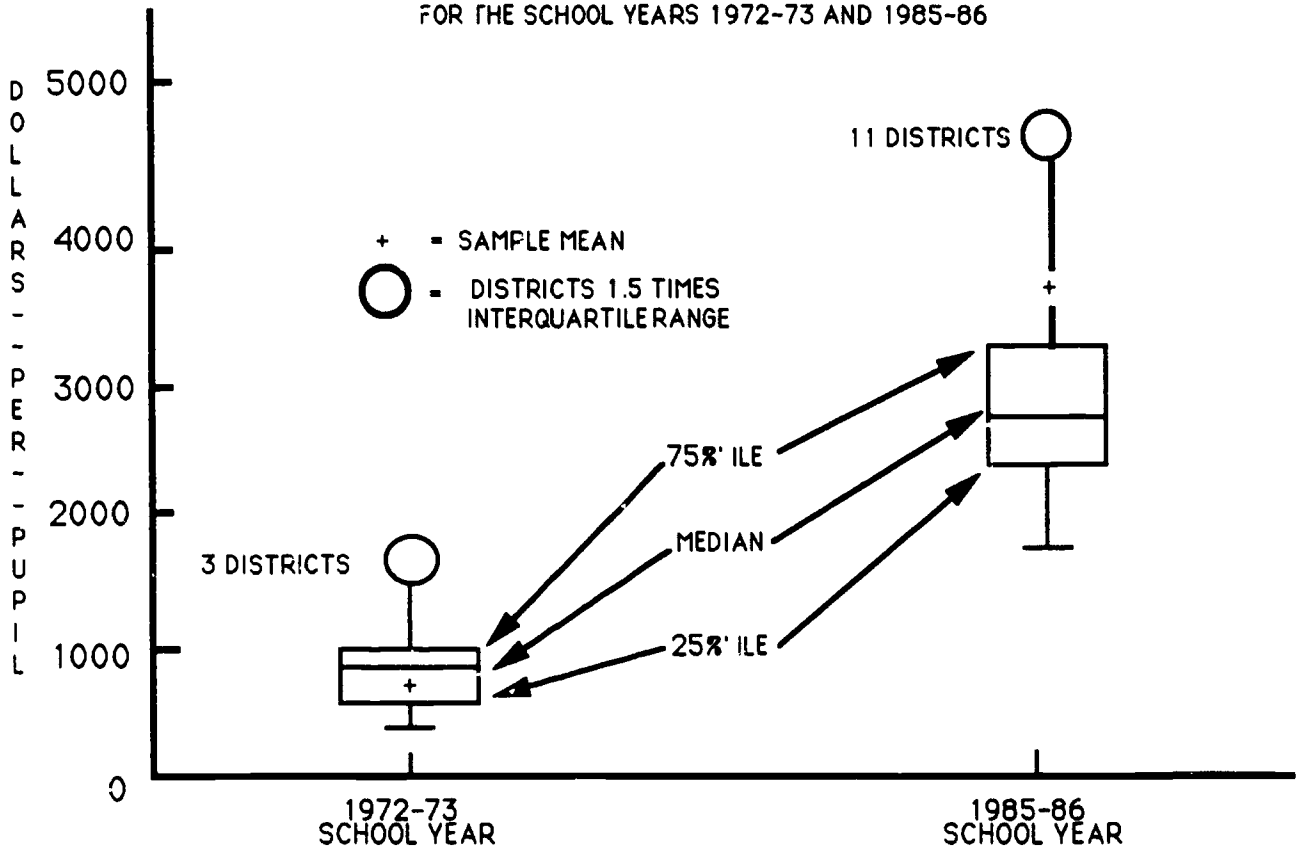

FIGURE 2.

LORENZE CURVES FOR OPERATING EXPENDITURES
FOR THE 1972-73 AND 1985-86 SCHOOL YEARS

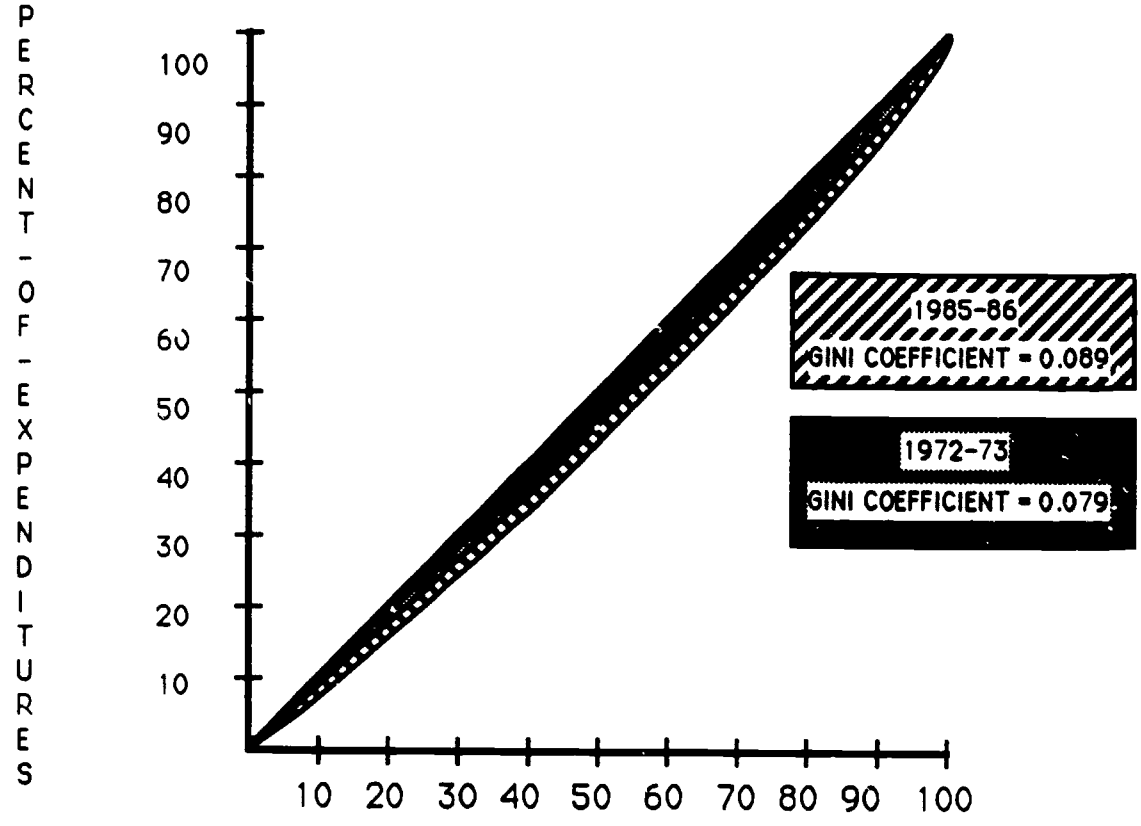

Table 1

Federal Range Ratio - School Operating Expenditures

1972-73 and 1985-86 School Years

	School Year 1972-73	School Year 1985-86
Federal Range - 95 Percent	$ 994.53	$4,408.34
Federal Range - 5 Percent	$ 662.08	$2,386.61
Federal Range Ratio	.5021	.8471

Coefficient of Variation

The coefficient of variation for the 1972-73 school year and the 1985-86 school year is summarized in Table 2. The coefficient of variation for the school operating expenditures is greater for the 1985-86 school year (.1439 for the 1972-73 school year compared with .1864 for the 1985-86 school year). The coefficient of variation indicates the 1985-86 school operating expenditures are more inequitable than the 1972-73 school operating expenditures.

Table 2

Coefficient of Variation - School Operating Expenditures

1972-73 and 1985-86 School Years

	School Year 1972-73	School Year 1985-86
Coefficient of Variation	.1439	.1864
Variance	$14,937.23	$286,001.53
Mean	$ 849.28	$ 3,869.72

McLoone Index

The McLoone index for the 1972-73 school year and the 1985-86 school year is summarized in Table 3. The McLoone index for the school operating expenditures is greater for the 1985-86 school year (.8662 for the 1972-73 school year compared with .9001 for the 1985-86 school year) which is an indication that the school operating expenses for the 1985-86 school year are more equitable for the pupils in the school districts who are below the median.

Table 3

McLoone Index - School Operating Expenditures

1972-73 and 1985-86 School Years

	School Year 1972-73	School Year 1985-86
McLoone Index	.8662	.9001
Median	$ 866.08	$2,963.36

Gini Coefficient

The Gini index for the 1972-73 school year and the 1985-86 school year is summarized in Table 4. The Gini index for the school operating expenditures is greater for the 1935-86 school year (.0796 for the 1972-73 school year compared with .0895 for the 1985-86 school year) which is an indication, taken as a whole, that the school operating expenses for the 1985-86 school year are more inequitable.

Table 4

Gini - School Operating Expenditures

1972-73 and 1985-86 School Years

	School Year 1972-73	School Year 1985-86
Gini Index	.8662	.9001

Fiscal Neutrality

The weighted Pearson correlation coefficient between the tax rate and the school operating expenditures for the 1972-73 school year and the 1985-86 school year is summarized in Table 5. The correlation for the school operating expenditures per tax district and the tax rate per tax district is greater for the 1985-86 school year (.0596 for the 1972-73 school year compared with .3527 for the 1985-86 school year). The results indicate that there was more of an association of school operating expenses with the tax rate for the 1985-86 school year than the 1972-73 school year.

The squared correlation coefficient for the 1972-73 school year (.0035) exhibits a low proportion of the variance explained between the tax rate of a taxing district and the school operating expenditures within the taxing district. The squared correlation coefficient for the 1985-86 school year (.1244) exhibits a higher proportion of the variance explained between the tax rate of a taxing district and the school operating expenditures within the taxing district. Table 5 contains data that exhibits a small association between the tax rate of a tax district and the school operating expenditures within the tax district for the 1972-73 school year and a higher association (moderate) for the 1985-86 school year.

Table 5

Pearson Pupil-Weighted Correlation Between

Tax Rate and School Operating Expenditures Per Tax District

1972-73 and 1985-86 School Years

	School Year 1972-73	School Year 1985-86
Correlation Coefficient (R)	.0596	.3527
Squared Correlation Coefficient (R^2)	.0035	.1244

The pupil-weighted Pearson correlation for the adjusted assessed valuation and the school operating expenditures for the 1972-73 school year and the 1985-86 school year is summarized in Table 6. The strength of the correlation between the rate tax and the school operating expenditures per tax district is higher in the 1972-73 school year (.6087 for the 1972-73 school year compared with .2520 for the 1985-86 school year). The increased correlation for the 1972-73 school year is an indication that there was more of an association between the assessed valuation of a tax

district and the tax district's school operating expenditures.

By squaring the correlation, the proportion of the variance that is explained is .3076 for the 1972-73 school year and .0635 for the 1985-86 school year. Table 6 contains data that exhibits a moderate association between the assessed valuation within a tax district and the school operating expenditures for the 1972-73 school year and a lesser association for the 1985-86 school year.

Table 6

Pearson Weighted Correlation Between

Assessed Valuation and School Operating Expenditures Per Tax

District

1972-73 and 1985-86 School Years

	School Year 1972-73	School Year 1985-86
Correlation Coefficient (R)	.6087	.2520
Squared Correlation Coefficient (R^2)	.3076	.0635

The pupil-weighted Pearson correlation for the adjusted assessed valuation and the tax rate for the 1972-73 school year and the 1985-86 school year is summarized in Table 7. The strength of the correlation between the assessed valuation and the rate tax district is higher in the 1985-86 school year (-.2520 for the 1972-73 school year compared with -.3109 for the 1985-86 school year) which is an indication that there is more of an association of a tax within a tax district and the school operating expenditures within the same tax district for the 1972-73 school year.

The negative sign before the weighted correlation indicates as the tax rate in a given district increases, the assessed valuation per pupil within the given tax district is lower. For example, two tax districts where school revenue is solely derived from the local tax levy, A and B, each of which spend a certain amount of dollars per pupil, tax district A, which has a low assessed valuation per pupil, would have a higher tax rate than B.

The strength of the association was higher in the 1985-86 school year indicating there was a stronger negative relationship between assessed valuation within a given district and the tax district's tax rate. By squaring the correlation, the proportion of the variance that is explained is .0635 for the 1972-73 school year and .0966 for

the 1985-86 school year. Table 7 contains data that exhibits the small association between the assessed valuation within a tax district and the tax rate for the 1972-73 school year and a larger association for the 1985-86 school year.

Table 7

Pearson Weighted Correlation Between

Tax Rate and School Operating Expenditures Per Tax District

1972-73 and 1985-86 School Years

	School Year 1972-73	School Year 1985-86
Correlation Coefficient (R)	-.2520	-.3109
Squared Correlation Coefficient (R^2)	.0635	.0966

Plot of Data

The adjusted general tax rate was obtained by dividing the general tax rate by the state adjustment factor. For the school year 1985-86, the general tax rate was added to the transportation tax rate (1972-73 general tax rate included the transportation tax rate) and then divided by the state adjustment factor. The adjusted general tax rate was expressed in dollars per $100 of adjusted assessed valuation.

The authors examined data plots between the school operating expenditure and the adjusted general tax rate as well as the school operating expenditures and the adjusted assessed valuation for the 1972-73 school year and for the 1985-86 school year, and the adjusted general tax rate and the adjusted assessed valuation for the 1972-73 school year and for the 1985-86 school year. Although not contained in this study due to brevity, there appears to be a distinct relationship between each of the variables examined for each selected school year. The plots of these data appear to be similar to the correlation discussed.

The purpose of this study was to examine the fiscal equity of Indiana's public school operating expenditures for the 1972-73 school year and the 1985-86 school year. The examination was conducted in two parts: (1) the horizontal equity of the school operating expenditures and (2) the fiscal neutrality of Indiana's public school operating expenditures. Table 8 summarizes the horizontal measurements.

Table 8

Horizontal Equity - School Operating Expenses

1972-73 and 1985-86 School Years

	School Year
Boxplot	1972-73 More Equitable
Lorenz Curve	1972-73 Slightly More Equitable
Federal Range Ratio	1972-73 More Equitable
Variance (Standard Deviation^2)	1972-73 More Equitable
Coefficient of Variation	1972-73 More Equitable
McLoone Index	1985-86 Slightly More Equitable
Gini Index	1972-73 Slightly More Equitable

With the exception of the McLoone index, the statistical horizontal measurements chosen for the study indicated that 1972-73 school operating expenditures were more equitable than the 1985-86 school operating expenditures. Comparing the school operating expenditures before the tax levy freeze and the latest available information indicates a widening of fiscal inequity.

The fiscal neutrality association is summarized in Table 9. There appears to be a relationship between the school operating expenditures and the wealth of the district for the 1972-73 school year and the 1985-86 school year.

For the school year 1985-86, there appears to be a higher linear relationship between the school operating expenditures per pupil of a given tax district with those tax rates levied against property owners within each tax district, i.e., a higher relationship exists between the tax rate levied against real property and the school operating expenditures within a given tax district. In addition, there appears to be higher linear relationship between the tax rate of a given district and the assessed valuation per pupil in a given district, i.e., the higher the tax rate, the lower the assessed valuation per pupil for the 1985-86 school year.

The 1972-73 school year appears to have a relatively strong linear relationship between school operating expenditures per pupil and the assessed valuation per pupil within a given tax district. For example, the higher the expenditures per pupil, the higher the assessed valuation.

Table 9

Fiscal Neutrality - 1972-73 and 1985-86 School Years

Weighted Pearson Correlation	
School Oper. Expend. and Tax Rate	1985-86 Higher
Oper. Expend. and Ass. Valuation	1972-73 Higher
Tax Rate and Assessed Valuation	1985-86 Higher

Data Plot	Clear Relationship	
School Year	1972-73	1985-86
School Oper. Expend. and Tax Rate	Yes	Yes
Oper. Expend. and Ass. Valuation	Yes	Yes
Tax Rate and Assessed Valuation	Yes	Yes

The fiscal neutrality of (1) the school operating expenditure and the adjusted general tax rate, (2) the school operating expenditures and the adjusted assessed valuation, and (3) the adjusted general tax rate and the adjusted assessed valuation exists. With the exception of the school operating expenditures and the adjusted assessed valuation, the linear relationship is strengthening which indicates there still does not exist a status of fiscal neutrality within the state of Indiana.

Implications

The implications of this study suggest that the fiscal equity of Indiana school operating expenditures for students and taxpayers are deficient in the 1985-86 as compared to before the property tax freeze. Despite the state assuming more of the expenditures, those expenditures paid by the local taxing districts have made school operating expenditures more inequitable.

In Indiana, there still exists (as of the 1985-86 school year) a relationship between a school taxing district's wealth and what that taxing district spends on its pupils. Those taxing districts that have more wealth, as measured by the assessed valuation per pupil, spend more money on their pupils than those taxing districts that have less wealth.

This study provides strong evidence that within Indiana, fiscal inequity exists for pupils and taxpayers. The horizontal component of fiscal equity for each pupil, i.e., each student within a given school corporation receiving the same amount of expenditures to provide for an

education, is increasingly inequitable for school operating expenditures. In addition, there exists a relationship between a taxing district school operating expenditures per pupil and the tax rate, school operating expenditures per pupil and the assessed valuation, as well as the tax rate and the assessed valuation per pupil within a taxing district.

In conclusion, state policies that result in greater fiscal commitment to support public education may not necessarily guarantee greater fiscal equity. These researchers can state with reasonable certainty that the public policy in Indiana of limiting local property tax levies in order to support public education has lead to greater fiscal inequity over time. Further, based on this assessment, the public policy of limiting local district revenues in order to increase fiscal equity has to be seriously examined on a state by state basis.