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Impact of Decreases in School Enrollments on Educational Costs

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by

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The Problem

Recent decreases in birth rates accompanied by net outmigration has meant that most Indiana school corporations have experienced a decline in student numbers. Total average daily membership for Indiana declined from 1,180,357 students to 1,121,161 students between 1972-73 and 1976-77, a drop of 5 percent. During the same time period, certified staff increased from 58,467 to 59,023 an increase of one percent. Most school corporations in Indiana are not making adjustments in certified staff to compensate for the enrollment declines, and, as a result per pupil expenditures are rapidly increasing.[1]

While it might be argued that a school corporation that is losing students needs less money to operate, state legislators, school administrators and others believe that it may not be possible for a school corporation to cut back programs sufficiently to compensate for reductions in state aid and the decreases in enrollment. For example, a

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[1] For most school corporations, the current school distribution formula provides state aid to the corporation equal to the dollar amount of state aid received in the previous year, plus a flat grant per pupil times the ADM for the current or previous year, whichever is greater. This formula has been in effect since the 1973 freeze. Hence, school corporations that have lost enrollment since the freeze continue to receive state aid at least partially based on the larger ADM of the prior year. This is why it is sometimes said that the state partially supports nonexistent "ghost" or "phantom" students.

school plant tends to be highly fixed with expenditures for heat, lights, and repairs being largely independent of enrollment levels. If enrollments decrease, schools can compensate by reducing teacher numbers. However, this may not always be immediately possible, given a fixed size and number of classrooms and a minimum educational program as required by state law. Pupil teacher ratios decrease as enrollment is lost and hence instructional costs increase. Administrative costs, the cost of library facilities, laboratories and vocational facilities are spread over fewer students as enrollments decrease.

Objectives

The objective of this report is to examine the impacts of decreases in student numbers on the cost of education. The reasons why decreases in student numbers might affect educational costs are examined. School corporations where student numbers have decreased most rapidly between the school years 1972-73 and 1976-77 are identified. The extent to which the problem exists in urban, suburban and rural schools will be examined. The degree to which a decrease in student numbers increases per pupil expenditures will be measured. Impacts of changes in student numbers on pupil/teacher ratios and teachers' salaries will be examined. Impacts of decreases in enrollment will also be identified for expenditures for school operation and maintenance. The role of decreases in student numbers on special education programs will be identified. The impact of changes in student numbers on assessed valuation levels will be identified. Finally, approaches for dealing with problems posed by decreases in student numbers will be outlined.

Why Declining Enrollments Affect Educational Costs

For most school corporations, instructional expenditures constitute the bulk (73 percent) of total general fund operating expenditures. Expenditures for teachers' salaries represent approximately 96 percent of instructional expenditures out of the 200 account. It is therefore appropriate that the most attention be directed to the relationship that exists between changes in enrollment levels and per pupil expenditures for instruction.

Assuming no non-salary instructional expenditures, the following relationship always holds.

$$\text{Per Pupil Expenditures for Instruction} = \frac{\text{Average Teacher Salary}}{\text{Pupil/Teacher Ratio}}$$

This relationship always holds because

$$\text{Per Pupil Expenditures for Instruction} \times \text{Number of Pupils}$$

$$= \text{Average Teachers' Salary} \times \text{Number of Teachers}$$

Per pupil expenditures for instruction decrease if average salaries in the school corporation decrease or if the pupil/teacher ratio increases. Conversely, per pupil expenditures increase as average salaries increase or as pupil/teacher ratios decrease. Table 1 indicates the expected increases in costs associated with a decrease in the pupil/teacher ratios for hypothetical school districts at several different levels of average salary and pupil/teacher ratios. A decrease in the pupil/teacher ratio has the greatest impact upon educational costs for those corporations that are currently operating at high average salary levels and low pupil/teacher ratios.

Table 1. The Cost of Decreasing Pupil Teacher Ratios

Average Teacher Salary	Pupil/Teacher Ratio	Per Pupil Expenditures for Instruction	Dollar Cost per Pupil of Decreasing the Pupil/Teacher Raio by one unit (pupil per class)
10000	15/1	$667/pupil	$48/pupil
10000	20/1	$500	$26
10000	25/1	$400	$17
10000	30/1	$333	$12
12000	15/1	$800/pupil	$57/pupil
12000	20/1	$600	$32
12000	25/1	$480	$20
12000	30/1	$400	$13
14000	15/1	$933/pupil	$67/pupil
14000	20/1	$700	$37
14000	25/1	$560	$23
14000	30/1	$467	$16

If decreases in enrollment levels are to raise per pupil instructional costs within a school corporation, this must cause pupil/teacher ratios within the school corporation to decrease and/or average teachers' salaries to increase. Cost items other than for instruction are comparatively minor expenditures. A relationship between changes in enrollment levels and per pupil expenditures for items such as plant operation expenses would indicate that these expenditures are fixed rather than variable costs.

What School Corporations are Losing the Greatest Number of Students?

Table 2 reveals the relationship between 1976-77 ADM and changes in enrollment from the school years 1972-73 to 1976-77. In Indiana, schools in large urban areas have been most affected by enrollment losses. Schools with a 1976-77 ADM of over 10000 students lost an average of 7.356 percent of their students over the five year period compared with a state average loss of approximately five percent. A few of the very small schools (less than 500 ADM) are also losing large numbers of students. This is not reflected in the change in enrollment figures since there are other very small schools that are rapidly increasing in enrollment.

The ten school corporations in the state classified as urban decreased in total ADM from 330080 in 1972-73 to 288597 by 1976-77. This represents a decrease of 12.57 percent. All other school corporations decreased in ADM from 850277 to 832564 over the same time period. This is a decrease of only 2.08 percent. Certified staff declined by 5.3 percent in urban corporations but increased by 3 percent in all other corporations.

Table 2. Changes in Enrollment and Total Per Pupil Expenditures from 1972-73 to 1976-77 by School Size

1976-77 ADM	Number of Corporations	Change in Enrollment	Change in Per Pupil Expenditures
less than 500	14	0.978	$301
500 - 1,000	26	-1.306	$305
1,000 - 2,500	137	-1.419	$285
2,500 - 5,000	76	-1.149	$291
5,000 - 10,000	25	-0.610	$301
greater than 10,000	21	-7.356	$333
Statewide Weighted Average of Corporations	299	-5.001	$305

The thirty school corporations that have lost the greatest number of students are listed in Table 3. These corporations include a number of small township schools that were never consolidated as well as large urban districts such as Indianapolis and Gary. These findings are consistent with those found in Michigan, Missouri, South Dakota and Washington.[2] Those school corporations located in central cities are particularaly affected by reductions in student numbers. Of the thirty corporations, six are classified as urban, eleven are classified as suburban and the remainder are classified as rural corporations.

Table 4 lists the thirty corporations that have experienced the greatest increase in ADM over the time period. None of these corporations are urban schools. Eighteen of these thirty corporations are classified as suburban schools and twelve are classified as rural.

School Corporations Used in the Study

In this study, school corporations in Indiana were divided into ten groups or deciles (each group or decile containing approximately 30 corporations), according to percentage changes in numbers of students between 1972-73 and 1976-77. Throughout the analysis, decile 1 represents those schools that on a percentage basis lost the greatest number of students over the time period. Decile 10 represents the schools that on a percentage basis gained the greatest number of students over the same time period. Deciles 2-9 represent intermediate groups with

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[2]Source: See Education Finance Center, Education Commission of the States, "The Fiscal Impacts of Declining Enrollments," Rept. F76-5, Denver, Colo., Educ. Finance Center, December, 1976.

Table 3. Thirty corporations that have experienced the greatest reduction in ADM, 1972-73 to 1976-77

Corp. No.	Corporation Name	1972-73 ADM	1976-77 ADM	Percent Change	Rural (R) Urban (U) or Suburban (S)
3640	Carr Township Schools	370.0	291.0	-21.35	R
1315	Barr-Reeve Community Schools Inc.	871.5	685.5	-21.34	R
4650	Lake Ridge Schools	5327.0	4216.5	-20.50	S
4760	Whiting City Schools	965.5	767.5	-20.50	S
5855	Crawfordsville Community Schools	3328.0	2693.0	-19.08	R
4720	Highland Town Schools	6752.5	5556.0	-17.71	S
5400	Speedway City Schools	2344.5	1929.5	-17.70	S
4710	Hammond City Schools	21898.0	18267.0	-16.58	U
2640	Union Township Schools	295.0	247.5	-16.10	R
4690	Gary Community School Corp.	43177.5	36333.0	-15.85	U
5385	Indianapolis Public Schools	93740.0	79100.5	-15.61	U
8590	Etna-Troy Township Schools	383.0	326.5	-14.75	R
8665	Columbia City Schools	1151.0	984.5	-14.46	R
7875	West Lafayette Comm. School Corp.	2631.0	2257.0	-14.21	S
1970	Muncie Community Schools	61254.0	14011.0	-13.80	U
2260	Baugo Community Schools	1546.5	1347.0	-12.90	R
6755	Greencastle Community Schools	2348.5	2046.0	-12.88	R
5380	Beech Grove City Schools	2845.0	2482.5	-12.74	S
6350	Tell City-Troy Twp School Corp.	3072.0	2694.5	-12.28	R
2865	Marion Community Schools	11225.0	9846.0	-12.28	S
4700	Griffith Public Schools	4304.0	3779.0	-12.19	S
5615	Maconaquah School Corp.	3833.0	3378.5	-11.85	R
7205	South Bend Community School Corp.	33089.0	29199.5	-11.75	U
4925	Michigan City Area Schools	12545.5	11137.5	-11.22	S
5370	M S D Washington Township	14933.0	13265.5	-11.16	U
7855	Lafayette School Corporation	9666.5	8602.5	-11.00	S
6160	Springs Valley Comm. School Corp.	1238.5	1104.5	-10.82	R
395	Benton Community School Corp.	3111.5	2775.0	-10.81	R
5995	South Newton School Corp.	1447.5	1291.0	-10.81	R
7365	Shelbyville Central Schools	4774.5	4260.0	-10.77	S

Table 4. Thirty corporations that have experienced the greatest increase in ADM, 1972-73 to 1976-77

Corp. No.	Corporation Name	1972-73 ADM	1976-77 ADM	Percent Change	Rural (R) Urban (U) or Suburban (S)
2815	Eastbrook Community School Corp.	2163.0	2343.0	8.32	R
5310	Franklin Township Comm. Sch. Corp.	2667.0	2908.0	9.03	S
5705	Richland Beanblossom Comm. Sch. Co.	2331.5	2552.0	9.45	S
2940	Eastern Cons. School Dist.	984.5	1079.5	9.64	R
4015	Jennings County School Corp.	4557.0	5013.0	10.00	R
*4880	Prairie Township Schools	44.0	48.5	10.22	R
8130	Warrick County School Corp.	7795.0	8643.5	10.88	S
125	M S D Southwest Allen County	2520.5	2815.5	11.70	S
4525	Westview School Corporation	1551.5	1737.5	11.98	R
3785	Kankakee Valley School Corp.	2333.5	2628.5	12.64	R
3135	Mt. Vernon Community School Corp.	1931.0	2203.5	14.11	S
3005	Hamilton Southeastern Schools	1680.0	1920.5	14.31	S
5350	M S D Pike Township	3249.5	3721.5	14.52	S
6750	Cloverdale Community Schools	1057.0	1212.0	14.66	R
5945	North Newton School Corp.	1733.5	1990.5	14.82	R
2275	Middlebury Community Schools	1929.0	2215.0	14.82	R
6460	Boone Township Schools	816.5	938.5	14.94	S
3070	Noblesville Schools	3439.0	2980.0	15.73	S
4615	Lake Central School Corp.	4875.5	5674.0	16.37	S
3315	Avon Community School Corp.	2217.0	2584.0	16.55	S
3180	North Central Comm. School Corp.	1932.0	2267.0	17.33	R
3060	Carmel Caly Schools	6413.0	7611.0	18.68	S
3030	Westfield-Washington Schools	1364.0	1626.0	19.20	S
6490	Morgan Township Schools	355.5	452.0	27.14	S
4770	Cass Township Schools	391.0	504.5	29.02	R
4205	Center Grove Community Sch. Corp.	3203.0	4204.5	31.26	S
6530	Union Township Schools	628.5	827.0	31.58	S
6540	Washington Township Schools	343.0	460.5	34.25	S
4790	Dewey Township Schools	299.0	405.0	35.45	R
6520	Porter Township Schools	887.5	1208.0	36.11	S

*Operates no schools, all pupils transferred out

regard to changes in student numbers. Included were all 299 corporations for which data were complete. Appendix A (Table 1) provides a table of excluded corporations.

Two problems occured in developing the decile groups based on changes in student numbers. The state currently bases state aid on the number of students in average daily membership (ADM) and per pupil expenditures in the various accounting categories are uniformly reported as expenditures per ADM. However, reported ADM figures include kindergarten students. For a few corporations which began kindergarten programs between the school years 1972-73 and 1976-77, changes in ADM will in a few cases overstate the actual change in students that occurred in grades one through twelve. The second measure of student numbers is students in average daily attendance (ADA) which is reported both on a K-12 and a 1-12 basis. However, state aid is not distributed nor are expenditures reported based on ADA. Both the percent change in ADM and the percent change in 1-12 ADA were calculated for each school corporation in the state. The analysis was conducted both on the basis of percent changes in ADM and percent changes in 1-12 ADA. The ADM figures were more strongly related to changes in per pupil expenditures than were the ADA figures (Table 3, Appendix A). Consequently, the figures contained in the main body of this report are based on ADM. The ADA figures are summarized in Appendix B.

A second problem concerned the relative weighting of each school corporation within the decile groups. An unweighted average for a decile would weight each corporation equally within the decile regardless

of its reported ADM. Hence:

$$\text{Per Pupil Expenditures for the Decile} = \text{Sum of Per Pupil Expenditures for the 30 corporations} \div 30$$

A weighted average would weight each corporation in the decile according to relative ADM in the corporation. Hence:

$$\text{Per Pupil Expenditures for the Decile} = \frac{\text{Total Expenditures for all 30 corporations}}{\text{Total ADM for all 30 corporations}}$$

In most cases, differences that occured as a result of the two weighting methods were very minor. Unweighted figures are reported in the main body of this report. The weighted figures are summarized in Appendix B (Table 2) based on percentage changes in ADM over the 1972-73 to 1976-77 time period.

Impacts of Declining Student Numbers on Total Per Pupil Expenditures

Table 5 reveals the impact of declining ADM on changes in total general fund expenditures. Total per pupil general fund expenditures as used in this report exclude expenditures for pupil transportation as well as expenditures on summer school. Appendix A (Table 2) provides a list of excluded funding codes.

Schools in decile 1 consist of the thirty corporations that experienced the greatest reduction in ADM over the time period 1972-73 to 1976-77. Schools in decile 1 lost an average of 14.5 percent of their ADM between 1972-73 and 1972-77. These schools experienced a corresponding increase in total per pupil expenditures of 383 dollars over the time period. These schools had a total certified staff of 15,516 in 1972-73 and 14,628 in 1976-77. This represents a reduction of only 5.7 percent.

Table 5. Impacts of Declining ADM on Total Genral Fund Expenditures, Unweighted Averages.

Decile	Mean ADM Percent Change 1972-73 to 1976-77	Per Pupil Expenditures 1972-73	Per Pupil Expenditures 1976-77	Dollar Change in Per Pupil Expenditures	Percent Change in Per Pupil Expenditures
1	-14.5	745	1129	384	53
2	- 9.0	693	1040	348	51
3	- 6.5	646	964	317	50
4	- 4.8	656	958	301	46
5	- 3.3	670	949	278	42
6	- 2.1	660	949	288	45
7	- 0.5	649	912	263	41
8	1.8	635	915	280	44
9	5.7	627	884	258	42
10	18.1	665	879	215	34
Statewide Unweighted Average of Corporations	- 1.6	665	958	294	45

Schools in decile 10 consist of the thirty corporations that experienced the greatest increase in ADM over the time period 1972-73 to 1976-77. Schools in decile 10 gained an average of 18.1 percent in ADM between 1972-73 and 1976-77. These schools experienced a corresponding increase in total per pupil expenditures of only 215 dollars over the same time period.

Correlation and regression analysis were used to further confirm the results obtained in Table 5. The simple correlation between the Percent change in ADM between 1972-73 and 1976-77 and the dollar change in Per pupil expenditures was found to be -.70. The following regression equation was estimated:

Change in Total Per Pupil Expenditures = 285.3
(2.8)

-5.24 X Percent change in ADM
(0.31)

R^2 = .48
F = 278.9

(Standard errors are in parentheses.)

Regression coefficients and the F ratio for the equation were significant at the .0001 level, confirming evidence to support the existence of a negative relationship between changes in ADM and changes in per pupil expenditures. The regression coefficient can be interpreted to mean that on the average, a one percent decrease in ADM over the time period 1972-73 to 1976-77 resulted in an increase in per pupil expenditures of 5.24 dollars.

Impacts of Declining Student Numbers on Per Pupil Expenditures for Instruction

As outlined earlier, the 200, or instruction account is the major component of total general fund expenditures. Table 6 indicates the relationship between changes in student numbers and per pupil expenditures for instruction. Not surprisingly, per pupil expenditures for instruction have risen much more rapidly in those corporations that have declined substantially in ADM over the time period. Schools in decile 1 averaged a 236 dollar increase (or 43 percent) in per pupil expenditures, whereas schools in decile 10 averaged only a 124 dollar increase (or 25 percent) in per pupil expenditures for instruction.

The following regression equation was estimated:

Change in Per Pupil Expenditures For Instruction = 176.4
(2.3)

- 3.66 X Percent Change in ADM
(0.26)

R^2 = .41
F = 205.7

Regression coefficients and the F ratio for the equation were significant at the .0001 level, confirming evidence of a relationship between changes in ADM and changes in per pupil expenditures for instruction. The simple correlation between the percent change in ADM between 1972-73 and 1976-77, and the dollar change in per pupil expenditures was found to be -.64. The regression coefficient can be interpreted to mean that a one percent decrease in ADM will increase per pupil expenditures for instruction by 3.66 dollars over the time period. Increases in per pupil expenditures for instruction must occur either because of an increase in the average salary level in the corporation, and/or because of a decrease in the pupil/teacher ratio.

Table 6. Impact of Declining ADM on Per Pupil Expenditures for Instruction.

Decile	Per Pupil Expenditures For Instruction 1972-73	Per Pupil Expenditures For Instruction 1976-77	Change in Per Pupil Expenditures	Percent Change in Per Pupil Expenditures
1	557	793	236	43
2	527	747	219	42
3	494	692	197	41
4	502	692	190	38
5	522	702	180	35
6	515	701	186	37
7	499	662	162	33
8	490	661	171	35
9	483	636	154	32
10	511	635	124	25
Statewide unweighted Average of corporations	510	693	182	36

Impacts of Decreases in Student Numbers on Pupil/Teacher Ratios

As indicated earlier, the pupil/teacher ratio for the school is an important component of the equation that determines per pupil expenditures for instruction:

$$\text{Per Pupil Expenditures for Instruction} = \frac{\text{Average Teacher Salary}}{\text{Pupil/Teacher Ratio}}$$

Decreases in pupil/teacher ratios occur as student numbers decline because administrators are unable or unwilling to make compensating adjustments in teacher numbers. Possible reasons why administrators do not make these adjustments in Indiana are quite varied.

1. The physical plant for the corporation may provide a severe restriction. If enrollment of an elementary classroom decreases from 25 to 20 students, the administrator cannot immediately change the physical structure of the building in order to reduce the number of teachers that are needed. Over the long run, adjustments can be made by closing certain school buildings and making other adjustments, but often immediate steps to adjust for declining enrollments are difficult if not impossible to make. A significant drop in student numbers is usually required to cut a position, and smaller corporations have greater difficulty than do the larger schools.

2. Contractual arrangements with teachers, tenure and seniority rules may impose restrictions. Contracts are signed in the spring, before the size of the enrollment reductions in the fall are known with certainty. If teachers are cut, it is usually the least experienced teachers that are cut first.

3. Pupil/teacher ratio reductions may be necessary in order to maintain a comprehensive program of course offerings at the secondary level in the face of declining enrollments. This is particularly true for specialized vocational courses, as well as advanced accademic courses, where enrollments are likely to be comparatively small to begin with. This is particularly true for the smaller corporations.

4. The need for special education programs in urban districts where losses in student numbers have been most severe may wash out the impacts of other moves the administrator may make to keep the pupil/teacher ratios at a higher level. The special education problem will be discussed in greater detail later in this report. Urban schools are also faced with a continuing need for additional certified personnel in guidance and quasi-police roles, which again may wash out any savings associated with a reduction in classroom teachers.

5. The current method of funding local schools based partially upon nonexistent ghost or phantom students may encourage administrators to reduce pupil/teacher ratios, since the corporation that is losing ADM is still being given state aid based on the larger ADM of the prior year. Even though the administrator could have made adjustments in teacher numbers in response to declining ADM, he may have not elected to do so. This is because of the availability of state aid based on the prior year ADM which would fund the "unneeded" teachers. The local school administrator may also feel that a reduction in pupil/teacher ratios should be a legitimate long term goal of the school system if the "quality" of education offered by the system is to

increase. For example pupil/teacher ratios will sometimes, but not always decrease if a new course is added to the curriculum. It is impossible from the available data to determine if reductions in pupil/teacher ratios that occur as a result of declining student numbers were due to variables largely outside the control of the administrator, or because the current state aid distrubution formula based in part on prior ADM does not sufficiently penalize the administrator for keeping pupil/teacher ratios comparatively high and per pupil expenditures low.

Table 7 reveals the relationship that exists between changes in student numbers and pupil/teacher ratio for the 10 decile groups. Differences in pupil/teacher ratios across decile groups appear initially to be rather minor. Over the time period, pupil/teacher ratios declined by 1.8 students per certified classroom teacher for decile 1, but increased by 0.3 students per classroom teacher for decile 10. This is as hypothesized. These small differences in changes in pupil/teacher ratios are largely responsible for the variation in per pupil instructional expenditures across deciles observed earlier. The simple correlation between the change in pupil/teacher ratio and the percentage change in ADM between 1972-73 and 1976-77 was found to be .47. The following regression equation was estimated:

$$\underset{\text{Teacher Ratio}}{\text{Change in Pupil/}} = \underset{(.08)}{-.94} + \underset{(.009)}{.086} \times \text{Percent change in ADM}$$

$$R^2 = .23$$
$$F = 86.3$$

The regression coefficient is significant at the .0001 level and can be interpreted to mean that a one percent decrease in ADM reduced

Table 7. Impact of Declining ADM on Pupil/Teacher Ratios

Decile	Pupil/Teacher Ratio 1972-73	Pupil/Teacher Ratio 1976-77	Change in Pupil/Teacher Ratio
1	22.5	20.8	-1.8
2	23.2	21.0	-2.2
3	23.0	21.4	-1.7
4	22.9	21.6	-1.4
5	22.5	21.5	-1.0
6	22.6	21.7	-0.9
7	23.1	22.1	-1.0
8	23.3	22.4	-0.9
9	24.3	24.1	-0.2
10	22.7	23.1	0.3
Statewide unweighted Average of corporations	23.0	22.0	-1.1

Pupil/teacher ratios by .086 students per certified classroom personnel over the time period. The F ratio for the entire equation is also significant at the .0001 level. Hence, pupil/teacher ratios are substantially influenced by changes in ADM levels.

Impacts of Decreases in Student Numbers on Average Salary Levels

Average salary levels within a school corporation should increase as student numbers decline. If student numbers do not increase, fewer new and probably inexperienced teachers need to be hired. Remaining teachers move to higher positions on salary schedules that are tied to teacher training and experience. Inexperienced teachers are cut first if any are not rehired as the result of declining enrollments, and the highly paid experienced teachers remain. Moreover, if enrollments do not increase, comparatively few new inexperienced teachers are hired, and the average training and experience level for teachers in the corporation should increase. Teachers in Decile 1, the 30 corporations losing the most ADM averaged 11.00 years experience in 1972-73 and 11.21 years experience in 1976-77. Conversely, teachers in Decile 10, the 30 corporations that experienced the most rapid increase in ADM, averaged only 8.85 years experience in 1972-73 and 9.70 years experience in 1976-77.

There were no significant differences in training levels between teachers in the two extreme deciles. Decile 1 averaged approximately 143 semester hours of training for 1972-73 and 153 semester hours of training for 1976-77. Decile 10 averaged approximately 145 semester hours of training for 1972-73 and 150 semester hours of training for 1976-77. These differences are not significant across deciles.

Table 8 summarizes changes in salaries over the five years for the 10 deciles. Schools that are losing students (decile 1) had higher average salaries in 1972-73 than did schools where enrollments are increasing (decile 10). However, all schools appeared to have approximately equal dollar increases in average salary levels over the time period. The following regression equation was estimated:

$$\text{Change in Average Salary Level} = \underset{(40)}{2741} - \underset{(4.40)}{8.53} \times \text{Percent Change in ADM}$$

$$R^2 = .01$$
$$F = 3.76$$

Neither the regression coefficient nor the F ratio was significant at the .05 level. Hence, changes in salary levels cannot be attributed to changes in the number of students in the school system.

Table 9 summarizes the impact of declining student numbers on the Teacher Education index. The teacher education index represents the combined education and experience level of the teachers in a school corporation, as calculated by The Indiana Department of Public Instruction. The minor differences in the teacher education index across deciles are primarily due to differences in the experience not training level of teachers.

Impact of Decreases in Student Numbers on Expenditures for Plant Operation and Maintenance

Even though expenditures for plant operation and plant maintenance have risen very rapidly over the last five years, these expenditures still account for a relatively small proportion of total educational

Table 8. Impact of Declining ADM on Teachers' Salaries

Decile	Average Teacher's Salary 1972-73	Average Teacher's Salary 1976-77	Dollar Change in Average Teacher's Salary	Percent Change in Average Teacher's Salary
1	10,762	13,638	2,876	27
2	10,563	13,303	2,741	26
3	9,798	12,489	2,691	27
4	9,933	12,844	2,911	29
5	10,031	12,788	2,756	28
6	9,957	12,834	2,876	29
7	9,835	12,444	2,608	27
8	9,703	12,433	2,720	28
9	9,917	12,816	2,899	29
10	9,766	12,229	2,462	25
Statewide Unweighted Average of Corporations	10,027	12,782	2,755	27

Table 9. Impact of Declining ADM on the Teacher Education Index

Decile	Teacher Education Index 1972-73	Teacher Education Index 1976-77	Change in Teacher Education Index
1	1.023	1.070	.047
2	1.025	1.067	.042
3	.997	1.042	.045
4	.995	1.044	.049
5	1.009	1.055	.046
6	1.001	1.053	.052
7	0.997	1.036	.040
8	0.991	1.042	.051
9	0.997	1.043	.047
10	0.974	1.014	.041
Statewide Unweighted Average of Corporations	1.001	1.047	.046

costs. There is weak evidence of a relationship between changes in these cost items and changes in ADM. Table 10 summarizes the results for plant operation. These expenditures have increased by an average of 63 dollars per pupil for decile 1, but only 38 dollars per pupil for decile 10. Table 11 summarizes the results for plant maintenance expenditures. Plant maintenance expenditures have increased by 18 dollars per pupil for decile 1 but only 9 dollars per pupil for decile 10. The following regression equations were estimated:

Change in Per Pupil Expenditures for Plant Operation = 47.25
(1.13)

- .75 X Percent change in ADM, 1972-73 to 1976-77
(.12)

R^2 = .11
F = 36.29

Change in Per Pupil Expenditures for Plant Maintenance = 12.10
(.66)

- .22 X Percent change in ADM, 1972-73 to 1976-77
(.07)

R^2 = .03
F = 9.09

The regression coefficient and the F ratio for the equation for predicting changes in per pupil plant operation expenditures were significant at the .0001 level. A one percent decrease in ADM would increase expenditures for plant operation by .75 dollars per pupil over the time period.

The regression coefficient and the F ratio for the equation for predicting changes in per pupil plant maintenance expenditures were significant at the .05 level. A one percent decrease in ADM would

Table 10. Impact of Declining ADM on Per Pupil Expenditures for Plant Operation

Decile	Per Pupil Expenditures for Plant Operation 1972-73	Per Pupil Expenditures for Plant Operation 1976-77	Change in Per Pupil Expenditures	Percent Change in Per Pupil Expenditures
1	$83	$146	$63	76
2	$72	$127	$54	75
3	$70	$123	$53	78
4	$71	$121	$50	73
5	$74	$120	$45	62
6	$69	$116	$47	71
7	$73	$120	$47	70
8	$71	$119	$48	73
9	$69	$108	$39	57
10	$75	$113	$38	54
Statewide Unweighted Average of Corporations	$73	$121	$48	69

Table 11. Impact of Declining ADM on Per Pupil Expenditures for Plant Maintenance

Decile	Per Pupil Expenditures For Plant Maintenance 1972-73	Per Pupil Expenditures For Plant Maintenance 1976-77	Change in Per Pupil Expenditures For Plant Maintenance	Percent Change in Per Pupil Expenditures
1	$27	$44	$18	112
2	$19	$35	$16	124
3	$22	$36	$14	87
4	$20	$32	$12	72
5	$21	$33	$12	65
6	$21	$30	$ 9	50
7	$18	$30	$ 9	67
8	$17	$31	$14	112
9	$16	$28	$11	87
10	$17	$26	$ 9	77
Statewide Unweighted Average of Corporations	$20	$32	$12	86

increase expenditures for plan maintenance by .22 dollars over the time period. The magnitude of the regression coefficients for both plant operation and plant maintenance expenditures are so small that these relationships can probably be ignored for policy purposes.

Impacts of Decreases in Student Numbers on Special Education Programs

An analysis was conducted in an effort to determine if school corporations with declining enrollments were experiencing increases in the growth of their special education programs beyond the state average. During 1972-73, the state had 2,007 special education teachers and 18,510 special education students. By 1976-77, this had increased to 3,071 teachers and 27,713 students. This represents a statewide increase of 53 percent in teacher numbers and 50 percent in student numbers over the time period.

Decile 1, those schools that experienced the greatest decrease in student numbers had a total of 504 special education teachers and 4,449 special education students in 1972-73. By 1976-77, these numbers had increased to 625 special education teachers and 5,333 special education students. This represents an increase of 24 percent in teacher numbers and a 20 percent increase in student numbers, substantially less than the state average. Schools in decile 1 employed 20 percent of all special education teachers in the state and had 19 percent of all special education students in 1976-77. These schools contained 24 percent of all teachers in the state and 24 percent of total ADM in the state.

Schools in decile 10, where student numbers are increasing most rapidly,had a total of 81 special education teachers and 660 special

education students in 1972-73. By 1976-77, these numbers had increased to 116 special education teachers and 880 special education students. This represents an increase of 43 percent in teacher numbers and 33 percent in student numbers over the time period. Schools in decile 10 employed 3.8 percent of all special education teachers and 3.2 percent of all special education students in 1976-77. These schools contained 6.4 percent of all teachers and 6.8 percent of all ADM for the state in 1976-77.

In summary, the total special education program, whether measured in terms of total numbers of teachers or students, is very large for the decile which has experienced the greatest reduction in student numbers. However, relative to the total number of regular teachers and students in the decile, special education programs are actually smaller for this decile than for the state as a whole. In other words, special education programs in corporations with declining enrollments are not disproportionately large when the total ADM is taken into consideration. Nor have special education programs expanded more rapidly for schools with declining enrollments than for other schools. In fact, the 20 percent increase in special education student numbers over the time period for schools in Decile 1 was substantially less than the 50 percent increase in student numbers for the state as a whole. Hence, special funding methods need not be employed to provide additional state aid for special education in schools with declining student numbers. A general formula for the funding of special education should adequately handle special education programs regardless of what is happening to the total ADM in the corporation.

Impacts of Decreases in Student Numbers on Assessed Valuations

In this section, the impacts of decreases in student numbers on adjusted assessed valuations is examined. The following identity holds between per pupil assessed valuation, total assessed valuation and ADM.

Per Pupil assessed Valuation = Total assessed Valuation ÷ ADM

Hence, if a school corporation loses ADM but total assessed valuation remains constant, per pupil assessed valuation will increase. If the school corporations in Indiana were entirely funded through the use of the local property tax, any increases in per pupil expenditures that occur as a result of decreases in ADM, could be compensated by the increase in per pupil assessed valuation.

Table 12 illustrates the relationship that exists between per pupil assessed valuation and changes in ADM over the time period. For 1976-77 adjusted assessed valuation on a per pupil (ADM) basis is highest for those school corporations that have experienced the greatest loss in ADM, and lowest for those corporations that have experienced the greatest increases in ADM. Moreover, the change in per pupil assessed valuation was very large for those corporations that lost ADM. The 4,074 dollar increase in per pupil adjusted assessed valuation represented a 37 percent increase for decile 1 over the time period. The 1,496 dollar increase in per pupil adjusted assessed valuation represented only a 14 percent increase for decile 10 over the time period.

Table 13 provides further evidence to suggest that corporations that have experienced the greatest reductions in ADM tend to be far

Table 12. Impact of Declining ADM on Per Pupil Adjusted Assessed Valuations

Decile	Assessed Valuation 1972-73	Assessed Valuation 1976-77	Change in Assessed Valuation	Percent Change in Assessed Valuation
1	10,913	14,986	4,074	37
2	11,120	14,142	3,022	27
3	9,369	12,297	2,928	31
4	11,026	13,943	2,917	26
5	9,812	12,183	2,371	24
6	10,530	13,052	2,522	25
7	9,978	12,580	2,592	26
8	9,068	10,878	1,809	20
9	8,295	9,744	1,449	17
10	10,532	12,028	1,496	14
Statewide Unweighted Average of Corporations	10,062	12,584	2,521	25

Table 13. Changes in ADM and Total Per Pupil Expenditures by Adjusted Assessed Valuation

Per Pupil Adjusted Assessed Valuation 1976-77	Number of Corporations	Change in ADM	Change in Per Pupil Expenditures
less than 5,000	2	-4.031	$269
5,000 - 7,500	30	-0.605	$292
7,500 - 10,000	77	0.647	$280
10,000 - 12,500	75	-2.013	$297
12,500 - 15,000	52	-3.208	$286
15,000 - 20,000	42	-2.114	$294
20,000 - 25,000	11	-2.415	$326
over 25,000	10	-6.217	$381
Statewide Unweighted Average of Corporations	299	-1.5776	$294

above average in per pupil adjusted assessed valuations. The 10 corporations with per pupil adjusted assessed valuations of above 2,500 experienced the greatest average reduction in ADM.

To further support these results the following regression equation was estimated:

$$\text{Change in Per Pupil Adjusted Assessed Valuation 1972-73 to 1976-77} = \underset{(117)}{2{,}383} - \underset{(12.92)}{67.38} \times \text{Change in ADM 1972-73 to 1976-77}$$

$$R^2 = .14$$
$$F = 45.7$$

Both the regression coefficient and the F ratio for the entire equation was significant at the .0001 level. The regression coefficient can be interpreted to mean that a one percent decrease in ADM increased per pupil adjusted assessed valuation by 87.38 dollars over the 1972-73 to 1976-77 time period.

Table 14 illustrates the relationships that exist between total adjusted assessed valuation and changes in ADM. Total adjusted assessed valuation has increased from 3,001.4 million dollars to 3,437.3 million dollars over the time period for decile 1, an increase of 14.5 percent. However, total adjusted assessed valuation increased from 664.8 million dollars to 922.0 million dollars over the time period for decile 10, an increase of some 38.7 percent. The simple correlation between the percent change in total assessed valuation and the percent change in ADM was a comparatively high .32. Hence, growth in assessed valuation is not as rapid in those schools that are losing student numbers as in other corporations.

Table 14. Total Adjusted Assessed Valuation By Decile, 1972-73 and 1976-77

Decile	Total Adjusted Assessed Valuation 1972-73 (000,000)	Total Adjusted Assessed Valuation 1976-77 (000,000)	Percent Change in Total Adjusted Assessed Valuation
1	3,001.4	3,437.3	14.5
2	2,049.5	2,385.3	16.4
3	692.7	852.1	23.0
4	868.6	1,037.4	19.4
5	1,081.5	1,321.1	22.2
6	1,249.3	1,559.4	24.8
7	774.3	990.6	27.9
8	699.1	859.6	23.0
9	697.4	874.5	25.4
10	664.8	922.0	38.7
Statewide	11,896.3	14,377.9	20.9

This is further supported by data contained in Table 15. With the total levy frozen, general fund tax rates should decline with the growth in total adjusted assessed valuation. General fund rates have declined the least in those school corporations that have experienced the greatested reductions in ADM (Decile 1). Conversely, general fund rates have decreased most rapidly in those corporations where there has been a growth in ADM (Decile 10).

Alternative Approaches for Dealing with the Declining Enrollments Problem

Several alternative policies for dealing with the problem of increased costs associated with declining enrollments are possible.

1. Continue to provide state aid to local schools based on current or prior year ADM, whichever is greater. Virtually all school corporations in the state now elect to take the total dollars of state aid they received last year, plus additional state aid equal to some dollar amount (i.e. 65 dollars) times the larger of current or prior year ADM. With this system, there is a small degree of pressure on the local administrator to make adjustments in programs as the ADM decreases. As the prior year ADM declines the total additional state aid made available through the flat grant program also decreases relative to what it was the prior year. However, it is not clear whether such a scheme overcompensates or undercompensates the school corporation for the actual additional costs associated with the decline in enrollments. Moreover, built into the total dollar amount of state aid the school corporation received the prior year is the lagged impact of flat grant programs of prior years. Hence, phantom students are

Table 15. Declining Enrollments and General Fund Rates

Decile	General Fund Rate 1972-73	General Fund Rate 1976-77	Change in General Fund Rate
1	4.59	4.02	-.57 (-12%)
2	4.47	3.82	-.65 (-15%)
3	4.35	3.72	-.63 (-14%)
4	4.59	3.70	-.89 (-19%)
5	4.53	3.68	-.85 (-19%)
6	4.46	3.71	-.75 (-17%)
7	4.36	3.50	-.86 (-20%)
8	4.58	3.74	-.84 (-18%)
9	4.62	3.88	-.74 (-16%)
10	4.70	3.79	-.91 (-19%)
Statewide Unweighted Average of Corporations	4.52	3.76	-.76 (-17%)

not only being funded directly through the flat grant times the prior year ADM, but also through the impact the flat grant programs had on total state aid for the prior years. The appeal of this scheme is primarily due to the fact that even if the school loses a large number of students in a given year, the total impact on state aid will be rather minor.

2. Move to a system that relies more heavily on the property tax. A key feature of a system of funding schools based on a local property tax is that it makes the school corporation at least partially immune to changes in revenues that occur as a result of changes in ADM. As ADM decreases, per pupil assessed valuations increase, and the school district has some of the money required to run its programs in the face of declining ADM. However, school corporations where ADM is declining have not experienced as great an increase in total adjusted assessed valuation as have other schools. Hence, even if schools were funded entirely with a locally levied property tax, school corporations would be only partially immune to the impacts of declining enrollments on the availability of revenue. The heavier the reliance is placed on taxes levied at the state level and revenues returned to local school corporation based on a statewide formula, the more difficult the problem of dealing with declining enrollments becomes. Elimination of the current freeze on the total levy that can be raised locally would ameliorate some of the revenue problems faced by local schools as a result of declining ADM.

3. Make Direct Adjustments in the current formula based on historical costs in school corporations. Coefficients derived from regression models contained in this report would be useful in determining the specific adjustments needed to the formula. For example:

Dollar Change in Total Per Pupil General Fund Expenditures 1972-73 to 1976-77 = $285. - 5.24 X Percentage Change in ADM 1972-73 to 1976-77

These changes can be put on a yearly basis by dividing the 285 dollars by 4:

$71.25 - $5.24 X Percentage Change in ADM for the year

The corresponding state aid to the local school corporation would be:

$$\frac{\text{Total State Aid Last Year}}{\text{Last Year's ADM}} \times \text{This Year's ADM}$$

$$+ 71.25 \times \text{This Year's ADM}$$

$$- 100 \left(5.24 \times \frac{\text{This Year's ADM} - \text{Last Year's ADM}}{\text{Last Year's ADM}}\right)$$

$$\times \text{This Year's ADM}$$

Suppose a school corporation last year had an ADM of 3000 and received 600 dollars per pupil of state aid last year. Suppose also that this year the ADM of the school corporation decreased 2 percent or 60 students. Last year, the school corporation received:

$600 X 3,000 = $1,800,000

This year the school corporation would receive:

$$\frac{1,800,000}{3,000} \times 2,940 + 71.25 \times 2,940$$

$$- 100 \left(5.24 \times \frac{2,940 - 3,000}{3,000}\right) 2,940$$

$$= 600 \times 2,940 + 71.25 \times 2,940 + 5.24 \times 2 \times 2,940$$

= 1,764,000 + 209,475 + 30,811 = 2,004,286

A school corporation that experienced no change in its ADM would receive

1,800,000 + 213,750 = 2,013,750

The formula consists of three components. (1) A basic grant based on historical per pupil expenditure levels, but on current ADM levels. (2) A flat grant based on current ADM levels, and (3) a component which on a per pupil basis will increase as the current ADM decreases from the prior year, and decrease as the current ADM increases.

The basic difficulty with this approach is in the heavy reliance placed on historical data. If there were inequities in the system of funding that generated past state aid levels, this scheme will ensure that these inequities will continue to exist. Ghost students are still represented in the basic grant which is largely based on the prior year's state aid. The appeal of this approach is that it does not represent a major shift in the current method of funding local schools.

3a. Recognize that the coefficients of a formula such as that outlined under 3 are a political decision, and treat them as such. For example, if legislators were relatively short on tax revenue, the 71.25 dollars might be adjusted downward to 50 dollars. Or if legislators did not feel that the 5.24 per pupil compensated those school corporations that experienced decreases in ADM, sufficiently this figure might be increased to 6 dollars.

4. Develop a coefficient similar to the teacher education index, and incorporate this coefficient that measures the loss in ADM directly into the formula. For example, a coefficient might be developed such as:

$$1 - \frac{(\text{This year's ADM} - \text{last year's ADM})}{\text{Last year's ADM}}$$

For our hypothetical school corporation, the coefficient would be

$$1 - \frac{(2,940 - 3,000)}{3,000}$$

$$= 1 + .02$$

$$= 1.02$$

In Indiana, this coefficient would range from .91 to 1.05, and could be easily incorporated directly into a number of different distribution formulae. A problem with this approach is again there is no way to ensure that such an adjustment exactly compensates the school corporation for costs due to declining enrollments. In a simple flat scheme would appear to give the school corporation slightly more than the regression approach would suggest. Suppose the formula is:

$$\text{the coefficient } \left(\frac{\text{last year's state aid}}{\text{last year's ADM}} \times \text{this year's ADM}\right.$$

$$\left. + 71.25 \times \text{this year's ADM}\right)$$

Our hypothetical school corporation would receive:

$$1.02 \left(\frac{1,800,000}{3,000} \times 2,940 + 71.25 \times 2,940\right)$$

$$= \$2,012,945$$

This basic coefficient could be incorporated into virtually any formula the legislature might be interested in.

4a. Make adjustments in the coefficient for individual school corporations that take into account the fact that the total state ADM is not constant, but declining. Hence, the coefficient for each school corporation would be:

$$\frac{\text{the coefficient as developed under 4}}{\text{the coefficient for the state}}$$

where:

the coefficient for the state

$$= 1 - \frac{\text{current state ADM - last year's state ADM}}{\text{last year's state ADM}}$$

For the state, this coefficient might be 1.0125. Hence the coefficent for our hypothetical corporation would be:

$$\frac{1.02}{1.0125} = 1.0074$$

And the corresponding state aid would be:

$$1.0074 \left(\frac{1,800,00}{3,000} \times 2,940 + 71.25 \times 2,940\right)$$

$$= \$1,988,078.$$

5. Institute programs that would make it easier for local school corporations to make adjustments in response to declining ADM. For example, a program that would allow and encourage teachers to retire earlier would enable local schools to easily make adjustments in the total teachers hired by the school system.

6. Expand cooperative relations with other school corporations. Two areas appear to have the greatest potential. Low enrollment vocational programs with comparatively high per pupil costs could perhaps be handled at a selected school corporation in an area. Community pride sometimes prevents cooperative ventures of this nature between school corporations. Special education programs may also have considerable potential for cooperative relations and combined enrollments of students with similar impairments between school corporations. The

problems associated with the bussing of special education students longer than normal distances in order to provide such cooperative programs may impose a constraint.

7. Make administrators, taxpayers and teachers aware of the high costs of marginal reductions in pupil/teacher ratios. For a school corporation currently operating at a pupil/teacher ratio of 20/1, a 1 pupil reduction in the pupil/teacher ratio would mean that a school system would have approximately 600 dollars less per teacher for salary increases, with little if any inpact on the learning process.

8. Less specialization in instruction and administration may be necessary. A full time guidance counselor may become a part time guidance counselor and part time classroom teacher in the face of declining ADM. Classroom teachers might be expected to be less highly specialized in subject matter orientation than has been true in recent years.

Summary and Recommendations

Recent decreases in birth rates and outmigration has meant that most Indiana schools have experienced a decline in student numbers. Total average daily membership has declined from 1,180,357 students to 1,121,161 between 1972-73 and 1976-77, a drop of five percent. At the same time, certified staff has actually increased one percent from 58,467 to 59,023. This has resulted in a decrease in pupil teacher ratios and a consequent increase in per pupil expenditures.

An analysis of the thirty school corporations that lost the greatest number of students reveals that, compared to the state average, these schools

(1) experienced an increase in per pupil expenditures of approximately $385 compared with a statewide average increase of $305 over the time period .

(2) experienced a reduction in pupil teacher ratios of approximately 1.8 students per teacher, compared with a statewide average of 1.2 students per teacher.

(3) experienced an increase in per pupil assessed valuation of approximately $4000 per pupil compared with $3000 per pupil for the state but did not grow as rapidly in total assessed valuation as did the state as a whole.

(4) did not increase salary levels more rapidly than the state as a whole.

(5) experienced increases in plant operation expenditures beyond the state average.

(6) did not decrease their property tax rates since 1973 as rapidly as did schools who have not lost students.

As student numbers decline, an Indiana school corporation cannot expect to maintain staff numbers and programs at the level that was needed when student numbers were larger. The basic political issue remains the question of the extent to which the state forces local school corporations to make adjustments in staff and program consistent with the smaller ADM levels. Any distribution formula, whether or not it is based on historical cost differentials, will have some impact on what adjustments the school administrator makes in response to declining enrollments. School administrators tend to spend all the aid they receive from the state. A formula that provides state aid above the total received the previous year will do little to encourage the local administrator to make staff adjustments in response to declining ADM. A formula which merely maintains, or reduces state aid to the local school corporation that experienced a declining ADM, will force the administrator to reduce certified staff and perhaps make other adjustments in programs.

Alternative solutions to the funding problems posed by declining student numbers include the following.

(1) Continue with the same scheme whereby schools receive state aid based on current or prior ADM, whichever is greater. Increases in per pupil expenditures occurring in school corporations may have been due to the current method of funding that bases state aid on the larger of current or prior ADM. There is no way of determining from

the data whether the current formula overcompensates or undercompensates school corporations for uncontrollable cost increases as a result of declining ADM. With the current system, as prior year ADM declines, there is modest pressure on the administrator to make staff cuts.

(2) Base state aid on current ADM, but make adjustments in state aid per pupil based on historical cost differences. Again, the historical cost data are not independent of the method of funding in effect when the data were generated. However, this method at least partially resolves the problem of paying for ghost pupils that were present in the school corporation five or ten years ago.

(3) Make simple adjustments in the distribution formula to account for declining enrollments, but do not base these adjustments on historical costs. For example, a school corporation that lost two percent of its students might receive two percent more state aid per pupil, but total state aid would be based on current ADM. Again, there is no way of determining whether this is the "correct" amount of compensation for school corporations with declining ADM.

(4) Return to funding more heavily based on property tax revenues. When schools were largely funded with the property tax schools were partially compensated for declining ADM. As ADM declined, per pupil adjusted assessed valuation rose, and more money per pupil was generated from the property tax. In many urban schools however, total assessed valuation and total ADM are not independent of each other. As ADM decreases, total assessed valuation also declines. A move back to the property tax (including a freeze removal) will only partially resolve the problem.

(5) Implement programs that would make it easier for schools to make adjustments for declining ADM. These include:

(a) early retirement programs that would enable school administrators to make greater adjustments in certified staff each year without "laying off" teachers.

(b) cooperative relations with other school corporations, particularly with regard to special education programs, and certain vocational courses that have low enrollments and consequently are extremely high cost per pupil, and

(c) a more flexible attitude toward the idea that teachers and administrators must be highly specialized with regard to subject matter orientation.

Appendix A

Table 1. Corporations Excluded from the Empirical Analysis.

Corporation Number	Corporation Name (County)
4000	Southwestern Jefferson Consolidated (Jefferson)
4590	Hobart Township Schools (Lake)
4860	New Durham Township Schools (LaPorte)
4880	Prairie Township School (LaPorte)
6620	Eastern Pulaski Community School Corporation (Pulaski)
8660	Columbia City Joint High School (Whitley) (Joint school, not a corporation)

Table 2. Excluded Accounting Categories Used in Calculating Adjusted Total General Fund Expenditures

Category	Code	Description
Instruction	243	Teaching Supplies for Summer School
Instruction	216.6	Salaries for Summer School
Instruction	271	Textbooks for Rent
Instruction	272	Textbooks for Resale
Instruction	265	Other Summer School Expenditures
Transportation	500	All Pupil Transportation
Community Services	1100	All Community Services
Capital Outlay	1200	All Capital Outlay
Debt Service	1300	All Except Temporary Loans (1322) and Emergency Loans (1323)

Table 3. Simple Correlations Between Changes in Student Numbers and Selected Variables.

Variable	Percent Change in ADM 1972-73 to 1976-77	Percent Change in 1-12 ADA 1972-73 to 1976-77
Change in Total Per Pupil Expenditures 1972-73 to 1976-77	-.70	-.44
Change in Per Pupil Expenditures for Instruction	-.64	-.60
Change in Per Pupil Expenditures For Administration	-.30	-.34
Change in Per Pupil Expenditures For Plant Operation	-.33	-.31
Change in Per Pupil Expenditures For Plant Maintenance	-.17	-.02
Change in the Pupil/Teacher Ratio	.47	.38
Change in Average Salary	-.11	-.16
Change in the Teacher Education Index	-.05	-.18
Change in Per PUpil Adjusted Assessed Valuation	-.37	-.22
Percent Change in Total Adjusted Assessed Valuation	.32	.27

Appendix B

Table 1. Selected Variables, Deciles based on Percent Change in ADA, 1972-73 to 1976-77.

Decile	Percent Change in ADA 1972-73 to 1976-77	Per Pupil Expenditures, General Fund			Per Pupil Expenditures for Instruction		
		1972-73	1976-77	Change	1972-73	1976-77	Change
1	-15.8	768	1,155	386	582	826	244
2	-10.6	690	1,026	336	530	743	212
3	- 7.9	659	954	295	508	692	184
4	- 5.6	659	958	299	514	698	184
5	- 4.1	644	924	280	493	684	190
6	- 2.9	661	946	285	420	706	186
7	- 1.2	668	944	276	516	693	178
8	.6	619	892	273	479	643	164
9	4.8	635	897	257	488	642	154
10	22.5	640	887	247	469	593	124
Statewide	- 2.1	665	958	294	510	693	182

Table 1. continued.

Decile	Pupil/Teacher Ratio			Average Salary		
	1972-73	1976-77	Change	1972-73	1976-77	Change
1	21.6	19.7	-1.9	10,801	13,630	2,829
2	22.5	20.8	-1.6	10,334	13,177	2,843
3	22.8	21.4	-1.3	9,990	12,805	2,815
4	22.7	21.4	-1.3	10,071	12,962	2,891
5	23.2	21.7	-1.6	9,745	12,434	2,689
6	22.3	21.4	-0.9	9,980	12,828	2,848
7	22.3	21.4	-0.9	9,730	12,495	2,765
8	23.8	22.7	-1.1	9,792	12,422	2,630
9	23.6	23.5	-0.1	9,847	12,736	2,890
10	25.4	25.4	0.0	9,953	12,307	2,356
Statewide	23.0	22.0	-1.0	10,028	12,783	2,755

Table 1. continued.

Decile	Per Pupil Adjusted Assessed Valuation 1972-73	1976-77	Change	Change in Per Pupil Expenditures for: Plant Operation	Plant Maintenance
1	12,211	16,543	4,332	66	17
2	9,807	12,373	3,566	53	16
3	9,742	12,772	3,030	52	12
4	9,801	12,449	2,647	53	18
5	10,265	12,352	2,087	39	9
6	10,273	13,019	2,747	47	7
7	10,841	13,039	2,199	44	11
8	8,466	10,308	1,842	44	12
9	8,808	10,247	1,436	44	12
10	10,304	12,601	2,297	40	12
Statewide	10,063	12,584	2,522	48	12

Table 2. Selected Variables, Deciles Weighted According to ADM.

Decile	Percent Change in ADM 1972-73 to 1976-77	Per Pupil Expenditures, General Fund			Per Pupil Expenditures for Instruction		
		1972-73	1976-77	Change	1972-73	1976-77	Change
1	-14.4	780	1,166	386	591	845	254
2	- 8.9	774	1,113	339	596	816	220
3	- 6.4	680	989	309	529	725	196
4	- 4.8	677	982	305	518	721	203
5	- 3.3	702	987	285	548	729	181
6	- 2.2	709	1,006	297	550	741	191
7	- 0.1	662	930	268	510	677	167
8	1.7	643	928	285	502	686	184
9	5.3	651	913	262	504	660	156
10	15.3	640	878	238	497	641	144
Statewide Weighted Average	5.00	718	1,023	305	552	748	196

Table 2. continued.

Decile	Pupil/Teacher Ratio			Average Salary		
	1972-73	1976-77	Change	1972-73	1976-77	Change
1	22.8	21.0	-1.8	11,289	14,599	3,310
2	22.9	21.3	-1.6	11,592	14,738	3,146
3	22.4	21.0	-1.4	10,213	13,014	2,801
4	22.9	21.6	-1.3	10,540	13,835	3,315
5	22.5	21.7	-0.8	10,517	13,472	2,955
6	22.2	21.6	-0.6	10,455	13,475	3,020
7	22.8	21.7	-1.1	10,343	12,689	2,346
8	23.3	22.5	-0.8	10,006	12,960	2,954
9	23.8	23.6	-0.2	10,201	13,142	2,941
10	23.5	22.8	-0.7	9,931	12,409	2,478
Statewide Weighted Average	22.9	21.7	-1.2	10,740	13,752	3,012

Table 2. continued

Decile	Per Pupil Adjusted Assessed Valuation 1972-73	1976-77	Change	Change in Per Pupil Expenditures for: Plant Operation	Plant Maintenance
1	9,698	12,977	3,279	61	14
2	11,423	14,591	3,168	52	16
3	9,873	12,989	3,106	53	16
4	9,927	12,457	2,530	49	13
5	9,796	12,369	2,573	49	11
6	11,871	15,157	3,276	51	9
7	9,860	12,688	2,828	52	10
8	8,308	10,043	1,735	47	13
9	8,317	9,901	1,584	43	14
10	10,127	12,176	2,049	40	9
Statewide Weighted Average	10,037	12,782	2,745	50	12