

**Financial Characteristics of High and Low Performing Schools
in a Predominantly Rural State**

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Introduction

Do high performing schools use resources differently than low performing schools? What are the connections between K-12 school funding and academic performance? Today several states (e.g., Illinois, Minnesota, New Jersey, Ohio, Oregon, etc.) are exploring answers to these questions as they attempt to fund schools adequately and in more efficient ways. The research literature from early production function studies (e.g., Brown & Saks, 1975; Hanushak, 1979, 1989; Harnisch, 1987) provides some partial answers, but some of the most recent studies have unearthed some conflicting results (e.g., Baum, 1986; Hedges, Laine, & Greenwald, 1994; Monk, 1994; Wenglinsky, 1997). In addition, few of the studies have examined rural schools. The purpose of the series of research studies described in this symposium was to address the questions above by examining the characteristics of high and low performing elementary, middle and high schools in a predominantly rural northeastern state.

Methodology

The first step in exploring the evidence from the high and low performing Maine schools entailed defining student performance and a standard of student performance to use in examining the schools. The Maine Educational Assessment (MEA) program was used in defining student performances. The MEA annually measures 4th, 8th, and 11th grade student achievement in six core areas: reading, writing, mathematics, science, social studies, and arts and humanities. MEA achievement is reported in six norm-referenced scale scores and proficiency levels are reported for reading, writing and mathematics.

Three criteria were selected for defining a high or low performing Maine school. These were the following:

1. A school level composite scale score average of one-half standard deviation above (or below) the state average.
2. 75% or more (or less) of the students in the school scoring at the Basic or above proficiency levels in reading, writing and mathematics.

3. A school level composite scale score average 0.50 residual z-score above (or below) the predicted school score.

To determine the first criteria, the six subtest scores over the last three years were averaged. The average could range from 100-400 points with a standard deviation of 50 points. In the case of the second criteria, student performance in reading, writing, and mathematics is also reported based on four criterion-referenced proficiency levels: Novice, Basic, Advanced and Distinguished. The average percent of students reaching Basic or above in the three content areas for the last three years was used in identifying schools.

Determining the third criteria, the value-added criteria, was more complex. Based on the work of Phillips and Adcock (1996) and Hofmann (1997), multiple regression was used to examine the relationship between school level school scale performance (Criteria A) and six community and school demographic variables. These variables were (1) median household income; (2) percent below poverty level; (3) percent college degree; (4) percent in professional position; (5) percent free or reduced lunch students in the school; and (6) the midpoint of the school MEA comparison score band. The four community variables were from the 1990 census. The free and reduced lunch percentages were provided by the Maine Department of Education, and the comparison band information was provided by the private testing agency responsible for developing and administering the MEA. Three demographic factors are used by the agency in calculating school comparison score bands: (1) percent free and reduced lunch; (2) percent of *parents* in white collar positions; and (3) presence of computer/encyclopedia in home (elementary level) or highest degree level achieved by one parent (middle and high school level). Table 1 reports the simple correlation matrix for the six demographic variables and 11th grade school level MEA performance. The information for the 4th and 8th grades appears in Appendix A.

Table 1
Correlations Between Demographic Variables and 11th Grade MEA Performance

	Md Hsld Income	% Below Poverty Level	% College Degree	% F & R Lunch	Midpoint Comparison Band	MEA Performance
Md Hsld Inc	1.00	.58	.60	.63	.73	.56
% Below Poverty Lev		1.00	-.38	-.52	-.55	-.39
% College Degree			1.00	.54	.73	.52
% F & R Lunch				1.00	.53	.43
Midpoint Comp. Band					1.00	.71
MEA Performance						1.00

Based on this evidence, a stepwise multiple regression analysis was conducted and this analysis yielded only one variable in the 11th grade cases (comparison score band midpoint). These findings were expected given that the comparison band score is calculated for *parents only* and does not include non-parent community members (i.e., census data). The resulting R² was .52 for the 11th grade data. Bases on this analysis, actual and predicted scores were generated for each high school in Maine, and the three criteria described earlier were used in the identification of 21 (16.5%) high performing and 21 (16.5%) low performing high schools in Maine. Data from these sets of schools were examined using analysis of variance procedures to determine if significant differences were present between the schools on a variety of input and resource variables. The findings from these analyses appears in the three preceding papers in this symposium. This paper reports some of the financial characteristics of these high and low performing schools.

Table 2

Level	High Performing Schools		Low Performing Schools	
	n	%	n	%
Elementary School (K-5)	78	20%	71	18%
Middle School (6-8)	34	13.5%	28	12%
High School (9-12)	21	16.5%	21	16.5%

Results

The results from the school level analyses indicated there were some distinguishing characteristics between high and low performing Maine elementary, middle and secondary schools. One question that comes to mind then is are these differences related to financial characteristics of the schools and how these schools choose to use these financial resources. Unfortunately only a partial answer to this question is available at this time. Maine, like most states, collects educational finance data primarily for regulatory purposes. Consequently, the data has limited value in addressing policy research questions. For instance, Maine school districts report financial expenditures in very broad categories and only at the K-8 and 9-12 categorical levels. School level data detailing expenditures are needed to address expenditure questions with more precision and confidence. Having said this, however, analysis of the categorical level data on high and low performing districts and secondary schools did reveal some distinguishing financial characteristics.

Table 3 reports financial information about high and low performing Maine school districts. High and low performing districts were defined as districts in which 50% or more of the schools in the district were identified as high (or low) performing

Table 3

Characteristic	High Performing Districts (n=15)		Low Performing Districts (n=13)		Prob.
	0	S.D.	0	S.D.	
A. Per Pupil Valuation	\$423,326	\$335,184	\$238,544	\$113,693	<.05
B. Education Effort	2.63%	.88	2.29%	.61	N.S.
C. Per Pupil Operating Costs	\$4,987	\$695	\$4,514	\$390	<.05
D. No. Pupils in District	1,246	844	792	446	<.05

schools. As indicated in the table, high performing school districts are more wealthy in terms of property. Per pupil valuation is calculated as the district total 1997 property valuation divided by the total number of students in the school district. The 1997 state average was approximately \$136,000 per student. Both high and low performing districts were above the state average, and the average per pupil evaluation for the high performing districts was approximately 77% higher than for the low performing districts.

However, one third of the high performing districts had per pupil valuation below the low performing district average. Thus, not all the high performing districts had high property valuations.

For this study an educational effort variable was also calculated for the two sets of districts. Educational effort was defined as the percent of tax paid on the median household income in the district that was used to support the district school system. The data in Table 3 indicates that there was no statistically significant difference in the educational efforts in high and low performing school districts. Residents in both sets of districts paid property taxes that were equivalent to 2-3% of their incomes to support district educational costs.

The two sets of districts did, however, spend significantly different amounts on the education of students. The average per pupil operating costs (excluding transportation, vocational education, special education, and debt services) in the high performing districts was approximately \$475 higher than in the low performing districts. Some of this difference is explained by differences in teacher educational levels in the high and low performing schools findings which were described in the earlier papers. However, not all of the difference appears to be attributed to this variable.

Table 4 reports some school level data for high and low performing Maine high schools. With the exception of one district, Maine school districts that have high schools have only one high school per district. Thus, school level financial information is available for the high and low performing secondary schools in Maine. The analysis of this school level information indicated no statistically significant differences in the total per pupil operating costs in the high and low performing high schools, nor any differences in regular classroom expenditures and school administrative costs. The range

Table 4

Expenditures	High Performing High Schools		Low Performing High Schools		Prob.
	O	S.D.	O	S.D.	
A. Per Pupil Operating Costs	\$4,195	1,392	\$4,274	810	N.S.
B. Regular Classroom Costs	\$2,563	1,128	\$2,587	533	N.S.
C. Special Education Costs	\$415	123	\$514	102	<.05
D. School Admin. Costs	\$385	213	\$384	102	N.S.

of expenditures with the high performing schools was considerably larger but the average expenditures were not statistically different. The only difference was for special education expenditures. Low performing high schools spent more per total student population than high performing high schools. Further analysis revealed that a higher percent of the students in the low performing schools were identified as special needs students than in the high performing schools (14.5% vs 12%), although this difference was not statistically significant. Unfortunately the data available did not permit a more detailed analysis of this factor to determine if the difference in the number of special needs students accounted for all the difference in special education costs in the two sets of schools.

Summary

Analysis of the financial resources of high and low performing school districts and high schools revealed some differences in community wealth and expenditures. High performing schools are most often located in wealthier school districts and these districts spent more per pupil than low performing districts. However, in the case of the high schools, how funds are spent on instruction and administration do not differ in high and low performing schools. An important note to keep in mind is that these findings must be viewed as only tentative. More detailed school level financial data is needed in order to more clearly establish the relationships between community wealth, expenditures, and student performances.

Appendix A

Table 5

Correlations Between Demographic Variables and 4th Grade MEA Performance

	Md Hsld Income	% Below Poverty Level	% College Degree	% F & R Lunch	Midpoint Comparison Band	MEA Performance
Md Hsld Inc	1.00	.60	.61	.55	.71	.51
% Below Poverty Lev		1.00	-.22	-.58	-.45	-.29
% College Degree			1.00	.43	.68	.42
% F & R Lunch				1.00	.40	.29
Midpoint Comp. Band					1.00	.47
MEA Performance						1.00

Table 6

Correlations Between Demographic Variables and 8th Grade MEA Performance

	Md Hsld Income	% Below Poverty Level	% College Degree	% F & R Lunch	Midpoint Comparison Band	MEA Performance
Md Hsld Inc	1.00	.59	.58	.64	.70	.51
% Below Poverty Lev		1.00	-.28	-.60	-.49	-.39
% College Degree			1.00	.43	.66	.52
% F & R Lunch				1.00	.55	.47
Midpoint Comp. Band					1.00	.60
MEA Performance						1.00

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