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Grading Texas Schools

“Society hopes that its investment will produce successful schools, but what kind of measure accurately reflects a school’s success?”

E ducation quality has become one of the most widely discussed topics in the nation. Perhaps nowhere has the issue been more hotly debated than in Texas, where state and local governments spend more than \$12 billion per year on education. Society hopes that its investment will produce successful schools, but what kind of measure accurately reflects a school’s success?

The mushrooming interest in improving education underscores the need to develop sound measures of school performance. Many measures have been attempted with questionable accuracy, such as expenditures per student or Scholastic Aptitude Test (SAT) scores.¹ Student achievement tests indicate whether students have mastered basic skills, but such tests cannot indicate whether the school taught those skills. The student may have learned the skills at home or in a different school. An accurate measure of school quality must be able to separate achievement produced in the current school from achievement produced in other schools or in the home.

Only the achievement gains that can be considered contributions by the current school, or *value added*, can accurately measure its quality. Using a measure that determines the value added by Texas school districts in the educational basics—

reading, writing and mathematics—the authors estimate each district’s effect on a statistically average student body and use those results to grade Texas school districts.²

Applying a Value-Added Measure to Texas Schools

With a value-added measure, researchers look not at achievement at one point in time, but at gains in achievement over time. Therefore, the measure requires two test scores—a pretest score and a post-test score. The difference between the two scores represents achievement gains. The analysis relies on each school district’s average scores on the Texas Educational Assessment of Minimum Skills (TEAMS) from 1987 as the pretest measure of achievement and average TEAMS scores for the same group of students from 1989 as the post-test measure of achievement. One major advantage of TEAMS over SAT scores is that TEAMS scores reflect achievement of all students, instead of measuring only college-bound students. Because privacy concerns prevented the Texas Education Agency from reporting

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test data for districts in which fewer than 25 students were tested on an exam, some school districts could not be used in the analysis.

For each school district in the sample, the authors looked at value added at both the primary (fifth grade) and secondary (11th grade) levels and used two achievement tests for high school—language arts and mathematics—and three achievement tests for grade school—reading, writing and mathematics. For completeness, they also combined the test results and considered the total value-added score. Distinguishing family characteristics from school characteristics required adjustments for the school district’s average socioeconomic status (measured by the number of students receiving reduced-price meals) and the school’s racial composition. Although characteristics of the home environment affect student achievement, they are not school contributions and should therefore be eliminated from a school quality measure.

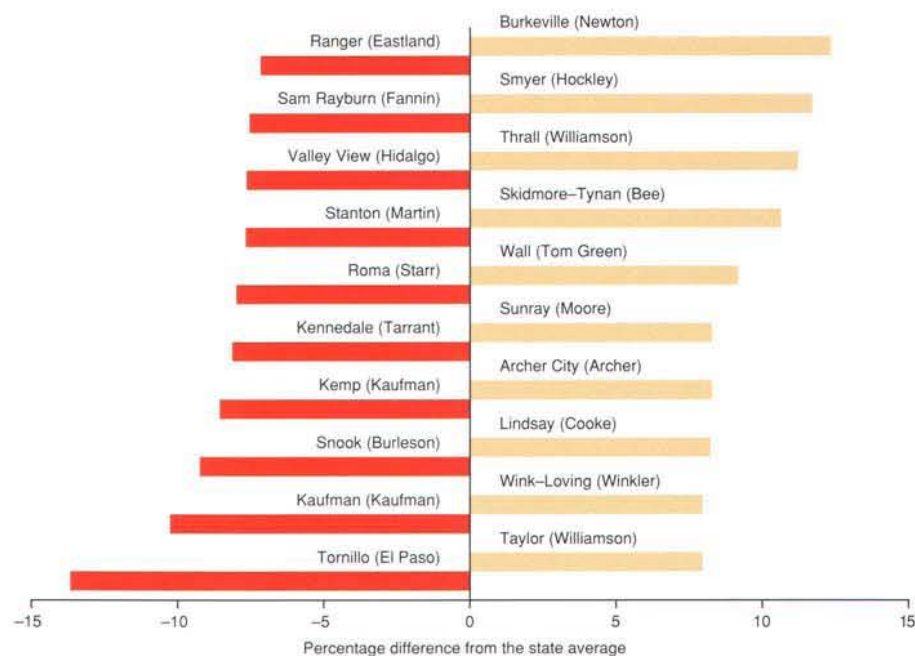
The Value-Added Report Card for Texas Schools

Using the results of their analysis, the authors constructed a value-added quality index that indicates how school districts differed from the state average in percentage terms between 1987 and 1989. The average Texas school district had an index score of zero. School districts that added *more* value in a particular subject than the state average had positive value-added scores. School districts that add *less* value than the state average had negative value-added scores.

If a school district had an index value of 5 on the high school mathematics index, then a statistically average group of students attending high school in that district from 1987 to 1989 could be expected to score 5 percent higher on the mathematics exam than the same group of students would score in the average school district. If a school district had an index value of -2 on the grade school reading index, then a statis-

Chart 1
Top and Bottom 10 Value-Added Rankings for Texas Grade Schools

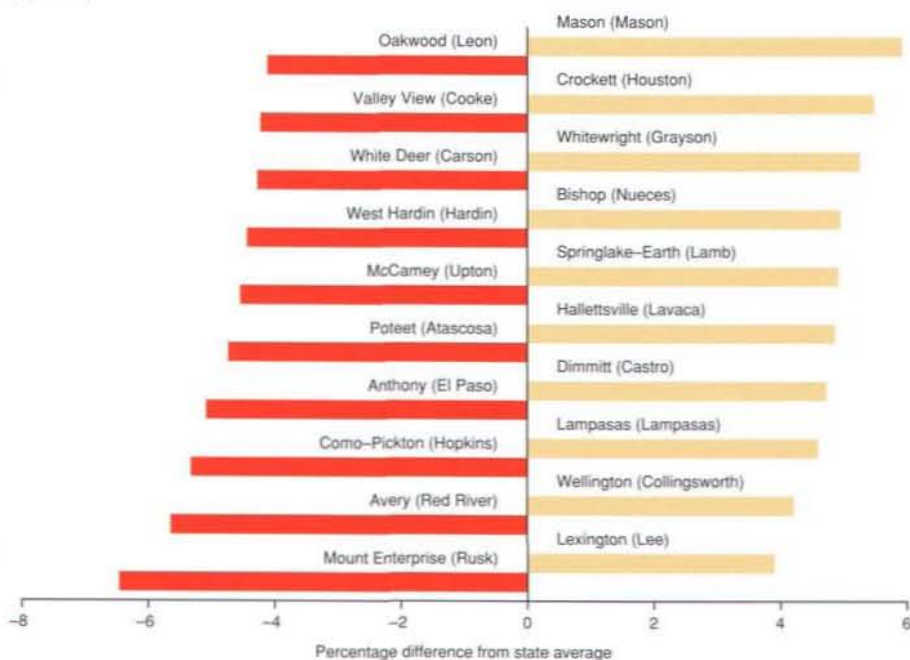
(By district)



NOTE: County names are in parentheses.
Results are based on TEAMS data for 1987 and 1989.

Chart 2
 Top and Bottom 10 Value-Added Rankings for Texas High Schools

(By district)



NOTE: County names are in parentheses.
 Results are based on TEAMS data for 1987 and 1989.

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tically average group of students attending grade school in that district would score 2 percent lower on the reading exam than the same group of students would score in the average school district.

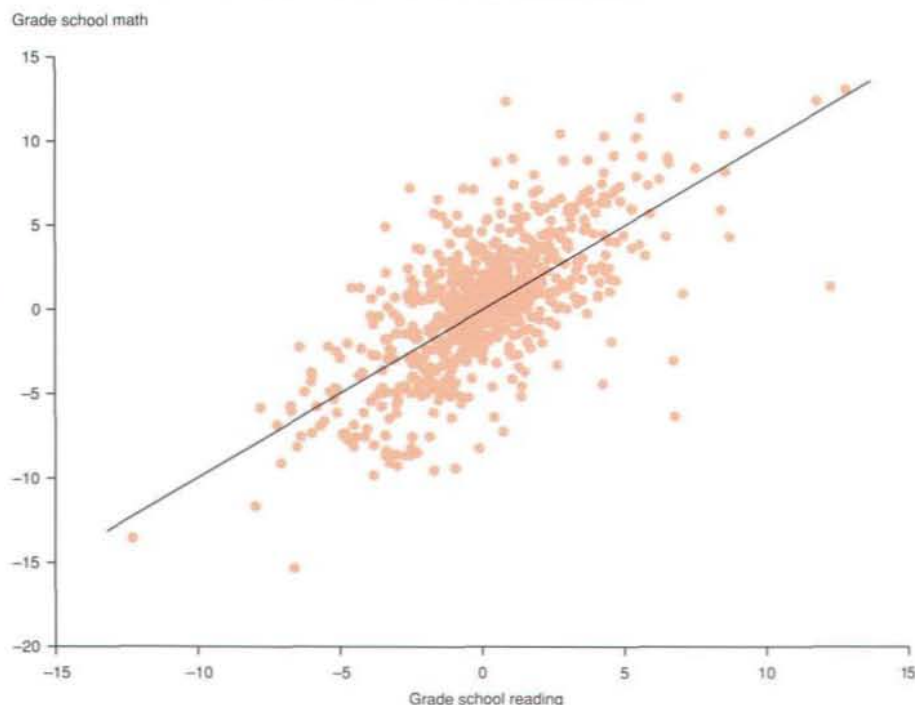
This study compared districts with the Texas state average. Even though a school district may have contributed more value than the Texas average, the relative quality of that district also depended on how Texas compared with the nation. It is conceivable that an above-average school district in Texas could still be below the national average or that a below-average school district in Texas could still be above the national average.

The index indicated that, at the high school level, the Lexington Independent School District in Lee County added the most value in math and total basic skills, while the Louise ISD in Wharton County added the most value in language arts. A statistically average group of students could be expected to score

5.9 percent higher in the Lexington ISD than in the average Texas school district. The state's lowest high school index values for math and total basic skills came from the Oakwood ISD in Leon County. A statistically average group of 11th graders could be expected to score about 6 percent lower than the state average on the combined test in the Oakwood ISD. Avery ISD in Red River County had the lowest value-added score in high school language arts.

At the grade school level, Burkeville ISD in Newton County had the highest score on writing and total basic skills indexes, while Smyer ISD in Hockley County scored best on the math and reading skills indexes. Tornillo ISD in El Paso County had the lowest value-added index on reading and total basic skills; Kaufman ISD in Kaufman County had the lowest index in math, and Snook ISD in Bureson County had the lowest index in writing. Chart 1 ranks districts with the top 10 and bottom 10 overall scores at the grade school

Chart 3
The Relationship Between Two Grade School Value-Added Scores



level. Chart 2 displays the same information for the high school level.³

Grade schools or high schools that scored well in one subject tended to score well in other subjects. For example, districts with high index values in grade school mathematics generally had high index values in grade school reading. Similarly, districts with low index values in high school language arts tended to have low index values in high school mathematics. Chart 3 illustrates this positive relationship between one score and another within a given grade level.

Above-average grade school scores, however, did not imply above-average high school scores, and vice versa. Value-added data suggested that creating quality may require different techniques at different grade levels. For example, the same district could have above-average grade schools but below-average high schools or below-average grade schools and above-average high schools. Chart 4 shows plots of value-added scores for grade schools and high schools in the same district. The chart looks more like a shotgun

blast than a straight line. The lack of a pattern indicates that the quality achieved at one level of schools was not related to the quality achieved at the other level. Each case was independent of the other.

The size of a school district's enrollment also did not explain differences in school quality. The six largest school districts in Texas showed no consistent pattern of value-added index scores. The Austin and El Paso ISDs had above-average high school but below-average grade school results. In contrast, the Dallas ISD had below-average high school but above-average grade school results. The Houston and Fort Worth ISDs had both below-average high school and grade school results. San Antonio ISD had above-average high school and average grade school results. With the exception of the Dallas ISD, which was 3.3 percent above the state average in fifth-grade math, none of these school districts were more than 2 percent above or 3 percent below the state average. Table 1 lists the index values of the 15 largest Texas school districts.

Comparing Types of Measures

An index of Texas school quality using single-exam scores, such as 11th grade TEAMS, will look similar but not identical to a value-added index. The difference between the two scores reflects factors not attributable to schools, such as family background, demographics and contributions of other schools.

Scores from several Texas school districts demonstrate the disparities between the two types of measures. San Antonio high schools ranked more than 4 percent below the state average using single-exam test scores but almost 1 percent higher than the state average with the value-added index. Brownsville grade schools, almost 5 percent below average using single-exam scores, were 1.2 percent above average using the value-added index. On the other hand, high schools in the Richardson ISD scored 5 percent above the average using single-exam scores but 0.4 percent below average using the value-added measure. Grades schools in the Arlington ISD scored 1 percent above average using single-exam scores but 1 percent below average using the value-added approach.

The value-added indexes also highlight the risks involved in using expenditures as a measure of school quality. No systematic relationship exists between value added and school district expenditures (or, for that matter, between single-test scores and expenditures). In general, higher spending did not produce higher value-added scores. For example, Troy ISD in Bell County spent 25 percent less than the state average per pupil in the 1988-89 school year but earned a value-added score of 2.5 at the high school level. In contrast, Sundown ISD in Hockley County spent more than twice the state average but earned a value-added score of -3.2 at the high school level. Both Floydada ISD in Floyd County and Spur ISD in Dickens County spent the average amount per pupil during 1988-89,

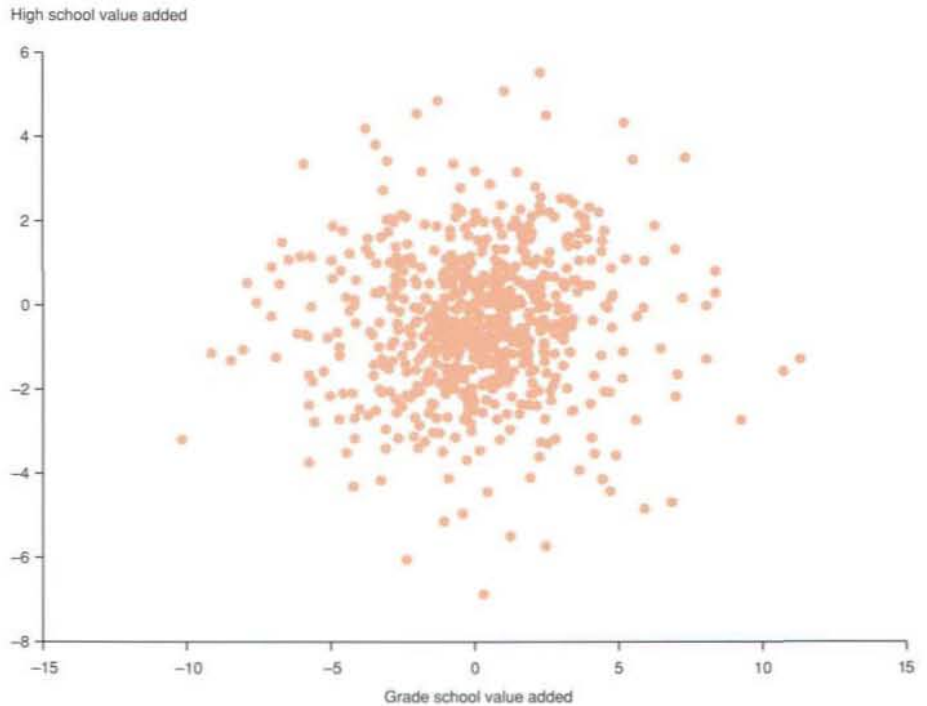
but Floydada ISD earned an index value of -0.7, while Spur ISD earned an index value of 0.8.

Conclusion

In general, few consistent patterns emerged in value-added index values for Texas school districts. For example, school districts with good grade school scores were no more likely to have good high school scores than were school districts with poor grade school scores, and vice versa. Assuming that some system or method could be created to establish and maintain quality school systems, the randomness of value-added scores of Texas school districts suggests that Texas has yet to employ such a method statewide. However, some individual school districts have been successful.

Accuracy favors the value-added school quality measure over such measures as expenditures per student or single-exam averages. The value-added approach filters out factors that are crucial to student achievement but not attributable to the current school. Such factors include family background, demographics, contributions of other schools and historical changes in school policy. The value-added approach more closely depicts school quality differences than single-exam scores.

Chart 4
The Relationship Between Grade School and High School Value-Added Scores



The value-added approach is the first step toward determining why some districts produce greater achievement gains than others. We must be able to measure performance before we can improve performance. The appeal of value added is that it moves us closer to a true measure of the differences in schools rather than the differences in

students. With the knowledge that these quality differences exist, we can move closer to the goal of understanding and attaining greater school quality.

— Beverly J. Fox
Lori L. Taylor

Table 1
Value Added by the 15 Largest Texas School Districts Expressed as a Percentage from the State Average

County	District	High School Total	Grade School Total
Harris	Houston	-.14	-1.45
Dallas	Dallas	-.93	1.76
Tarrant	Fort Worth	-.68	-.61
El Paso	El Paso	.16	-1.19
Travis	Austin	1.60	-.92
Bexar	San Antonio	.76	-.01
El Paso	Ysleta	-1.58	-.79
Bexar	Northside	1.33	-.34
Tarrant	Arlington	-.35	-1.34
Nueces	Corpus Christi	-1.14	.95
Bexar	North East	.06	.84
Harris	Aldine	-1.47	.39
Harris	Cypress-Fairbanks	-.76	.75
Cameron	Brownsville	-.44	1.23
Harris	Pasadena	.02	-1.20

NOTE: A positive value implies that the school district added more to student achievement than the state average. A negative value implies that the school district added less to student achievement than the state average.

¹ For a more detailed discussion of the accuracy of these measures, see Hanushek, Eric A., and Lori L. Taylor (1990), "Alternative Assessments of the Performance of Schools," *Journal of Human Resources* 25(2):179-201.

² The average school district in Texas has a student body that is 65.4 percent white, 25 percent Hispanic, 9 percent black and 0.6 percent Asian. Thirty-five percent of the students are of low socioeconomic status. In deriving their value-added index, the authors used regression analysis to estimate each school district's effect on a statistically average student body, meaning one that has the compositional characteristics of the average school district in Texas.

³ For a complete list of value-added indexes for Texas school districts, see Taylor, Lori L., and Beverly J. Fox (1991), "Variations in Texas School Quality," Federal Reserve Bank of Dallas Research Paper No. 9105, April.