



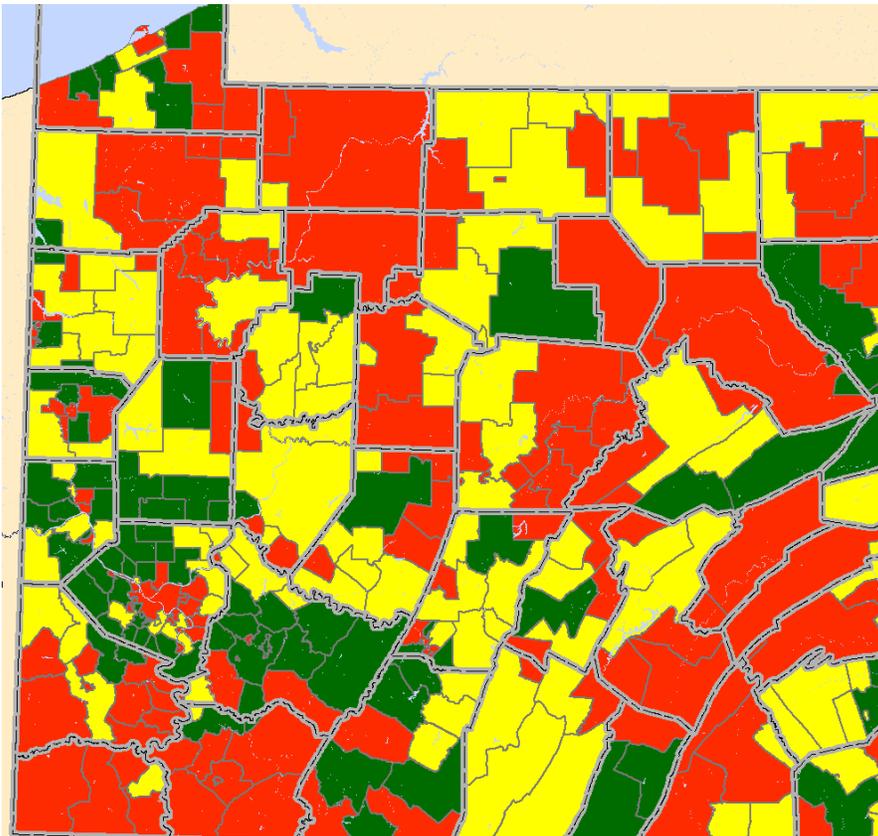
REINVESTMENT
FUND



Assessing the Relationship Between School Quality and Home Prices Across the Keystone State

Prepared by **REINVESTMENT FUND**

Published **AUGUST 2017**



RESEARCH CONDUCTED BY

Policy Solutions at Reinvestment Fund
Michael H. Norton, Chief Policy Analyst
Jacob Rosch, Research Associate

This work was supported by a grant from The William Penn Foundation.
The opinions expressed in this report are those of the authors and do not necessarily reflect the views of The William Penn Foundation.

Each year between 2010 and 2015 nearly 170,000 homes were bought or sold in Pennsylvania. Across the entire state, home sales generate \$28 billion in transactions every year. For families, schools play an important role in residential decisions. A 2015 home buyer survey conducted by the National Association of Realtors found that 30% of all home buyers and 43% of home buyers under the age of 50 considered the quality of their school district when choosing where to purchase.¹

Schools play a powerful role in shaping local real estate markets, just as local real estate markets play a powerful role in shaping the quality of public schools. Access to high-quality schools and a well-functioning school district are competitive advantages for cities and towns competing for residents who can exercise choices of where to live. The success of schools and students makes communities desirable places to live, and when schools struggle, communities struggle to retain families who can afford to move.

For nearly 50 years, economists have studied the role that schools play in a family's residential choices. Their findings confirm what real estate professionals and parents have always known: Families will pay more to live in a community with great schools. But it is not just families with children who benefit from high-quality schools. From New Zealand to North Carolina, researchers consistently find that improving school performance can have a positive influence on the value of all homes potentially served by those schools. High-achieving schools are an asset for the entire community and the benefits of having a high-quality school system are shared across the real estate market of an entire district.²

This study examined the relationship between home values and school performance to measure the way schools contribute to home prices in Pennsylvania. Of course, school quality is only one of many factors that influence home prices. This study accounted for the following differences between school districts to isolate the relationship between school performance and home sales prices: historical home values, income levels of district residents, population growth, unemployment rates, and the geographic region. The analyses were designed to ensure that rapid population changes between 2010 and 2015 in any district would not unduly influence the relationship between district performance and changing home sales prices. After accounting for these differences between districts, school performance was significantly and positively associated with changes in home sales prices across the state.

Between 2010 and 2015, districts with higher levels of student proficiency experienced greater growth in home sales prices than other districts, even after accounting for factors like population change and economic growth. It is also true that districts with declines in the percentages of students in the lowest-performance categories on state tests had more positive changes in home prices than other districts.



HIGHER ACADEMIC
PERFORMANCE WAS
ASSOCIATED WITH
GREATER APPRECIATION
IN HOME PRICES IN
SUBSEQUENT YEARS.

¹ "Home Buyer and Seller Generational Trends Report, 2015." National Association of Realtors. <https://www.nar.realtor/sites/default/files/reports/2015/2015-home-buyer-and-seller-generational-trends-2015-03-11.pdf>

² Phuong Nguyen-Hoang and John Yinger. "The Capitalization of School Quality into House Values: A Review." Journal of Housing Economics. Vol. 20, No. 1 (2011). https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1895351

Across the state, the results of this study suggest that on average, a one percentage point improvement in the proportion of students scoring proficient or advanced on state tests was associated with a gain of \$513 to \$620 in the average home sales price across a school district. At the other end of the performance spectrum, shrinking the share of students scoring below basic by a one percentage point was associated with a gain of \$756 to \$775 in home sales price across a school district.

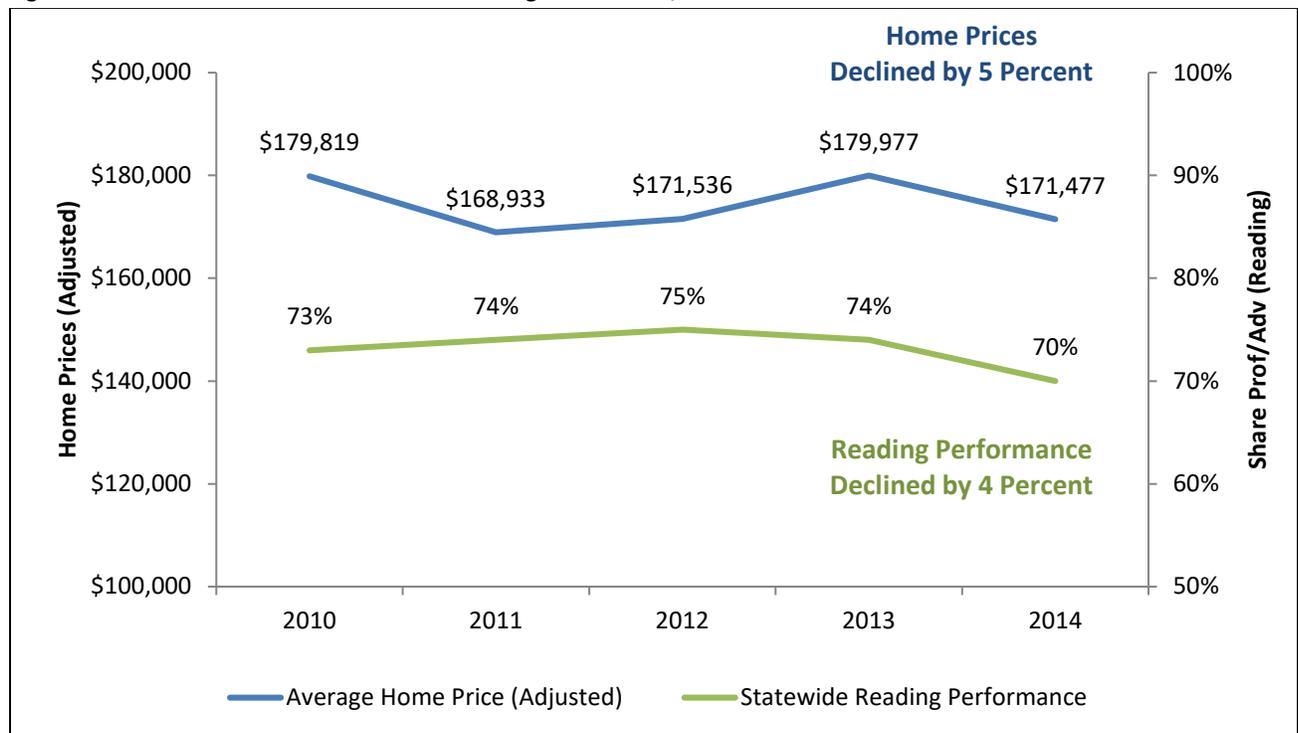


REDUCING THE SHARE OF STUDENTS SCORING BELOW BASIC BY ONE PERCENTAGE POINT WAS ASSOCIATED WITH A \$756 TO \$775 GAIN IN HOME SALES PRICES

Comparing Prices and Performance

The relationship between home values and school performance is easy to observe. Since 2010, school performance and home sales prices in Pennsylvania have generally moved in similar directions. Figure 1 presents the statewide trend in home sales prices (adjusted for inflation) between 2010 and 2014, alongside the statewide share of students scoring proficient or advanced on the Pennsylvania System of School Assessment (PSSA) Reading Assessment. During this period, home sales prices and reading proficiency levels declined slightly across the state.

Figure 1: Five-Year Trend in Home Prices and Reading Performance, 2010 to 2014



Note: Home prices were adjusted to 2014 values using the Consumer Price Index.

Between 2010 and 2014, statewide proficiency levels in reading declined 4 percent, from 73% to 70%, as did statewide average home prices, which fell by 5 percent.³ While home prices and district performance generally move in a similar direction, it’s not immediately obvious how this relationship

³ Figure 1 presents both the percentage point change in reading performance (73% to 70%) along with the percent change in reading performance (4 percent). The percent change is used here to show the comparable change with median home sales prices across the state, which also declined 5 percent from \$179,819 to \$177,477.

operates. That is, do home sales prices drive school performance; does school performance drive home sales prices; or is there a mutually reinforcing relationship between home sales prices and school performance that creates the similar trend lines presented in Figure 1?

Measuring the Economic Influence of School Performance on Home Sales Prices

A significant body of research suggests that schools play a powerful role in shaping local real estate markets and that real estate markets play a powerful role in shaping the quality of schools. While this may sound circular, thinking about the relationship over time can add clarity. Thriving schools and well-functioning school districts are valuable assets that can attract residents who have options about where they can live. Over time, as more residents are drawn to an area, home values tend to rise, which in turn provides more resources for schools to offer additional services and high-quality educational experiences for students.

Historically, school districts across Pennsylvania with the highest home sales prices have also had elevated student performance. Between 2010 and 2014, *seventy-four of the seventy-five districts with above-average home sales prices also had above-average reading performance. (See Appendix A for maps of district performance and home values.)*

Understanding how school quality can contribute to higher home values requires accounting for the historic differences in home prices between districts. In addition, other factors such as geographic location, tax rates, population, and economic conditions can also influence home prices. To estimate the relationship between school performance and housing prices, it is necessary to account for these non-educational factors.

Scholars studying the association between home prices and school performance use a range of methods to estimate the relationship. The most common approaches rely on regression analyses—a statistical technique to measure the way multiple factors may influence different outcomes.

Regression analyses allow researchers to separate the impact of school performance from the impact of non-educational factors. For example, by comparing home prices in districts with similar household incomes but different educational outcomes, it is possible to separate the impact of school quality from the impact of household income. By “controlling” for other factors that influence home prices in this way, it is possible to measure the association between school quality and housing values apart from the influence of non-educational factors.

Regression models were used to assess the relationship between school performance and the change in home prices between 2010-11 and 2014-15. These analyses were designed to measure the relationship between district-level performance in 2010 and 2011 and the five-year change in home values in each school district. By using only two years of district performance to assess changes in home values, this design also mitigates the influence that changes in district populations exert on district-wide academic performance.

Each analysis included a set of controls (see Table 1) to account for non-educational factors that also influence housing prices, such as population changes, historical home values, and employment.⁴ The relationship between school performance and changes in home prices was measured separately for reading and for math. (See Appendix C for regression results.)

Table 1: Outcome and Controls Related to Academic Achievement and Home Prices

Outcome	Educational Performance Measures	Controls
<ul style="list-style-type: none"> Change in Residential Sales Prices, 2010-2011 to 2014-2015 	<ul style="list-style-type: none"> Share of Students Scoring Proficient or Advanced in Reading and Math, 2009-10 & 2010-11 Share of Students Scoring Below Basic in Reading and Math, 2009-10 & 2010-11 	<ul style="list-style-type: none"> Median Home Values in 2010-11 Change in Total Population from 2010 to 2015 Change in the Civilian Unemployment Rate from 2010 to 2015 Location of School District—Urban, Suburban, Town, or Rural

Note: All prices were adjusted to 2014 dollars using the Consumer Price Index.

Results Find a Positive Association Between Performance and Prices

In both reading and math, *there was a strong, positive, and statistically significant relationship between district performance in 2010-11 and the change in district home sales prices.* These results suggest that even after accounting for factors like changing populations and employment rates, districts with higher performance experienced larger gains in average home prices between 2010-11 and 2014-15 than districts with lower performance. On average, each percentage point increase in the share of students scoring proficient or advanced on state tests was associated with a \$513 to \$620 increase in average home prices across a district. In other words, moving more students to grade level was associated with an additional gain of \$513 to \$620 in the average home sales price in subsequent years. Table 2 presents the estimated change in home prices associated with increasing the percentage of students achieving proficiency in reading and math.



MOVING MORE STUDENTS TO GRADE LEVEL WAS ASSOCIATED WITH AN ADDITIONAL GAIN OF \$513 TO \$620 IN THE AVERAGE HOME SALES PRICE IN SUBSEQUENT YEARS.

Table 2: Estimates of the Impact of Increasing the Share of Students Scoring Proficient or Advanced on Home Prices

	Change in Home Prices from Increasing Performance by 1%	Change in Home Prices from Increasing Performance by 5%
Reading	\$620.01	\$3,100.05
Mathematics	\$513.25	\$2,566.24

⁴ In regression analyses, it is difficult to include multiple factors that are highly related to each other because they make the model statistically unstable. In other words, if there are two highly related factors in a model predicting a third, it is very difficult to know which of those two predicting factors is truly most influential. For example, by controlling for home sales prices in 2010-11, this modeling structure also effectively accounts for other factors that are highly correlated with home sales prices, such as median household incomes in 2010. In addition, controls for location provide a way to account for differences in the socio-demographic composition (e.g., race, educational attainment) of districts located in different parts of the state. By controlling for changes in the district population, these analyses also account for these changes over the study period. In general, district populations will change substantially enough over a five-year period to substantively influence home sales prices. Rapidly changing areas of the state tend to be located within large districts, e.g., in Philadelphia and Pittsburgh. While turnover may be fast enough to influence home sales prices in individual neighborhoods, it would be very difficult to measure the effect of a handful of rapidly changing neighborhoods on district-level prices across the state.

On the other end of academic performance, reducing the share of students who score “below basic” (the lowest-performance category on state PSSA tests) in reading and math was also significantly associated with positive changes in home sales prices.

Table 3 presents the estimated change in home prices associated with reducing the percentage of students scoring “below basic” (BB) in reading and math. These results suggest that after accounting for changing populations and employment rates, reducing the share of students scoring below basic by one percentage point on state tests was associated with a \$756 to \$775 increase in average home prices across a district.

Table 3: Estimates of the Impact of Reducing the Share of Students Scoring Below Basic (BB) on Home Prices

	Change on Home Prices of Reducing BB Perf. by 1%	Change on Home Prices of Reducing BB Perf. by 5%
Reading	\$775.90	\$3,879.51
Mathematics	\$756.65	\$3,783.27

Importantly, the results presented in Tables 2 and 3 are independent and not mutually reinforcing. That is, the first set of analyses isolated the relationship between proficiency levels and home sales prices and the second set of analyses isolated the relationship between below basic levels and home sales prices. It was not possible to estimate the relationship between simultaneous increases in proficiency levels and reductions in below basic levels on changes in home sales prices due to the very strong inverse relationship between the proportion of students scoring proficient and below basic in districts across the state.

Estimating a Financial Contribution of School Performance

Even small changes in home values can make a substantial financial contribution when aggregated across an entire community. For example, consider a small community with 15,000 households (a population of about 35,000 people) and an effective property tax rate of 1.35% (the Pennsylvania average).

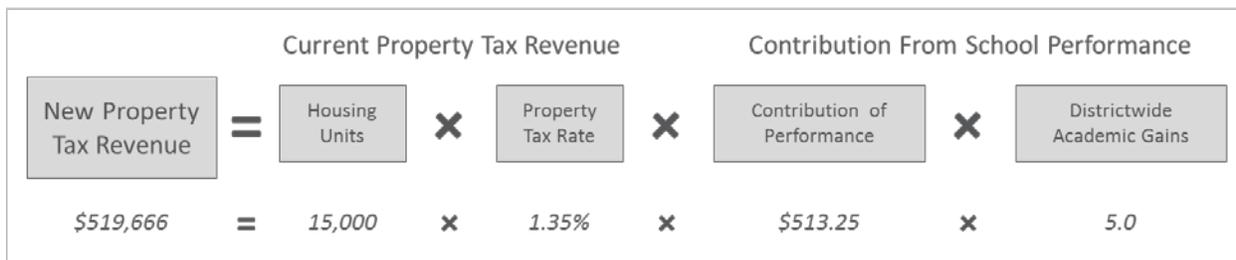
If the community’s school district could have increased the percentage of students achieving proficiency by five percentage points while all other factors remained the same (including other school districts’ performance), the contribution from elevated academic performance would have added \$519,663 in property taxes to the town’s coffers every year.⁵



FOR A SMALL COMMUNITY... THE CONTRIBUTION FROM ELEVATED ACADEMIC PERFORMANCE WOULD HAVE ADDED \$519,662 IN PROPERTY TAXES

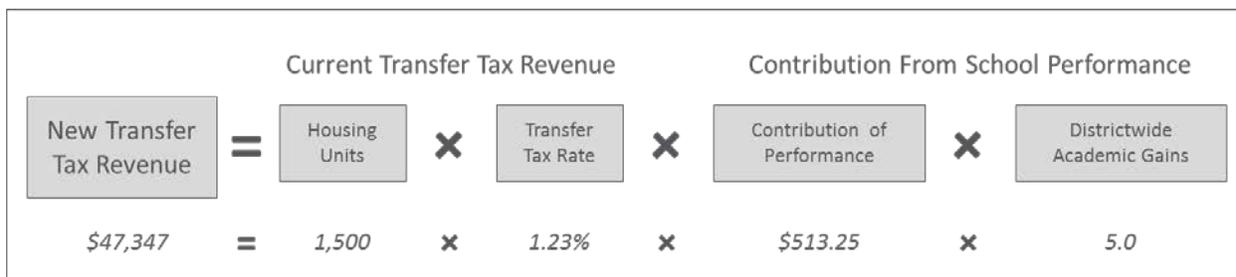
⁵ A key feature of the regression analyses in this report is that estimates generally represent “marginal changes.” This means that estimates of the impact of increasing school performance assume that all other factors remain the same, including the performance of other districts. It is plausible that a large improvement in school achievement could have an impact on other factors like population growth, economic conditions, or even the relative performance of other nearby school districts. Throughout this report, the estimates presented assume that improvements in district performance happen in isolation and do not influence other external factors.

Figure 2: Calculating Property Tax Gains from Boosting School Performance



Rising property values also bolster municipal revenues from real estate transfer taxes. Imagine the same community above, and assume nearly 10% of the homes are sold each year and the local transfer tax is 1.23% (the Pennsylvania average). If the percentage of students scoring proficient or above on the PSSA had been five percentage points higher in a district, it could have added an additional \$47,347 in annual transfer tax revenue.

Figure 3: Calculating Transfer Tax Gains from Boosting School Performance



Tables 4 and 5 present the annual fiscal contributions of different school improvement scenarios for the same town of 15,000 households: 1) raising the share of students scoring proficient and advanced; or 2) lowering the share of students that scored below basic. These estimates assume other districts’ academic performance remains unchanged.

Table 4: Estimated Annual Contribution of Raising District Performance by Increasing Students Scoring Proficient or Advanced

Increase in Students Scoring Proficient or Advanced	Estimated Property Tax Revenue	Estimated Transfer Tax Revenue	Total Contribution
+1 percentage point	\$103,933	\$9,469	\$113,402
+2 percentage points	\$311,798	\$28,408	\$340,206
+5 percentage points	\$519,663	\$47,347	\$567,010
+7 percentage points	\$727,528	\$66,286	\$793,814

Table 5: Estimated Annual Contribution of Raising District Performance by Decreasing Students Scoring Below Basic

Decrease in Students Scoring Below Basic	Estimated Property Tax Revenue	Estimated Transfer Tax Revenue	Total Contribution
-1 percentage point	\$157,120	\$14,315	\$171,436
-2 percentage points	\$471,360	\$42,946	\$514,307
-5 percentage points	\$785,601	\$71,577	\$857,178
-7 percentage points	\$1,099,841	\$100,208	\$1,200,049

Place Matters - Improving Academic Performance Means Different Things in Different Places

The results above represent a statewide relationship between district performance and changes in home sales prices. These results also suggest that the school districts with the lowest home sales prices potentially stand to gain the most from improving academic performance. Table 6 divides school districts into quartiles based on each district's average home price in 2010-11, and shows how much prices increased between 2010-11 and 2014-15, alongside an estimate of how much prices *could have* changed if district performance had been five percentage points higher in 2010-11.



SCHOOL DISTRICTS WITH THE LOWEST HOME PRICES POTENTIALLY STAND TO GAIN THE MOST FROM IMPROVED SCHOOL QUALITY

The findings presented in Table 6 highlight a ceiling effect at work for home sales prices and academic performance. Wealthier districts already have the highest home values, leaving little room for growth. Similarly, in districts where proficiency levels are already over 85%, i.e., the top quartile of districts, there simply isn't much room for improved proficiency. Since most districts with elevated academic performance are also high-priced districts, a double ceiling effect suppresses any changes to be had in home sales prices for improved performance.

Table 6: Range of Impacts from Improving Share of Students Scoring Proficient or Advanced in Reading

	Average Home Price, 2010-11	Students Scoring Proficient or Advanced in Reading, 2010-11	Average Change in Home Prices, 2010-11 – 2014-15	Estimated Change in Home Prices if Performance Improved 5% Points	Percent Increase in Estimated Home Prices if Performance Improved 5% Points
Group 1	\$62,015	68%	\$3,232	\$7,002	117%
Group 2	\$100,404	73%	-\$2,093	-\$200	90%
Group 3	\$146,311	76%	-\$9,243	-\$5,490	41%
Group 4	\$264,129	83%	-\$15,066	-\$12,088	20%
PA Average	\$143,296	75%	-\$5,793	-\$2,693	54%

Note: All prices were adjusted to 2014 dollars using the Consumer Price Index.

Districts with the highest prices in 2010-11 (Group 4) also had the highest academic performance in 2010-11, and experienced the largest declines in prices between 2010-11 and 2014-15. Had these districts' proficiency levels been five percentage points higher in 2010-11, the estimated declines in home prices would have been reduced by 20 percent. On the other hand, Districts with the lowest home prices (Group 1) generally had the lowest academic performance in 2010-11 and experienced small gains in home prices between 2010-11 and 2014-15. Had proficiency levels in these districts been five percentage points higher in 2010-11, these gains would have been more than twice as high.

In some ways, the results presented in Table 6 reflect the reality of the relationship between home sales prices and performance—the greatest gains for improved academic performance are likely realized in those districts with lower performance and lower home sales prices. However, districts with high-performing students and elevated home sales prices still have an interest in preserving both the performance of their schools and their property values since these are mutually reinforcing characteristics that define their communities.

Conclusion

The results presented in this memo point to a strong, positive relationship between school performance and home prices throughout Pennsylvania. For municipalities throughout the state, steps to support the academic performance of public schools may provide a boost to local property values and municipal revenues that benefit the entire community, not only those with children in public schools. These results also suggest that the potential gains in home values and local tax revenues associated with improving student academic performance are likely to be far greater in those districts with historically lower home values across the state.

These results also point to new insights worthy of additional study. First, these findings suggest that the changes in home sales prices associated with reducing the share of students scoring below basic, the lowest-performance category on state tests, were greater than those associated with increasing the share of students scoring proficient or advanced. Prior studies examining the link between school quality and home values have not examined the relative tradeoff between increasing high performance and reducing low performance.

Second, while these findings suggest that improving school performance may support elevated home sales prices, these findings do not address interrelationships among school districts. High-quality schools are valuable assets that can attract new residents and provide a boost to property values, but the findings presented in this memo do not assess the degree to which competition among school districts for residents may also influence student performance and home sales prices.

While the relationship between school performance and home values is complicated, there is no dispute that high-quality public schools provide a valuable public good. The benefits of high-quality schools are often described in terms of what they offer to students and the families they serve, but the results presented in this study suggest that high-quality schools can also provide an economic benefit for the entire community.

Data and Methods

Throughout this memo two measures of school performance were used to measure school quality. These measures, provided by the Pennsylvania Department of Education, included reading and math performance, measured by the share of students scoring proficient or advanced on state tests in grades 3 through 8. For each measure, individual school performance results for school years 2008-09 to 2013-14 were downloaded and aggregated. District performance represents the overall percentage of students enrolled in grades 3 to 8 in each district (in charter and district-operated schools) who scored proficient or advanced or below basic on state tests. District populations exclude virtual schools and alternative education programs (e.g., schools for incarcerated youth or developmentally disabled individuals) and private and parochial schools, which generally do not take state tests.



WHILE THE RELATIONSHIP BETWEEN SCHOOL PERFORMANCE AND HOME VALUES IS COMPLICATED, THERE IS NO DISPUTE THAT HIGH-QUALITY PUBLIC SCHOOLS PROVIDE A VALUABLE PUBLIC GOOD.

To measure home prices, Boxwood Means provided Reinvestment Fund with the count and aggregate transaction value of all arms-length residential property sales occurring in each census block group in Pennsylvania between 2010 and 2015. District averages were calculated by averaging each block group contained in the district, weighted by the number of sales in each block group and the share of each block group located inside the district's boundary. All property values were adjusted to 2014 dollars using the Consumer Price Index.

The formal modeling structure for the regression analysis is represented by:

$$\Delta y_i = y_{t1i} + Sx_i + Pz_i + Uz_i + Gz_i + e \quad \text{where:}$$

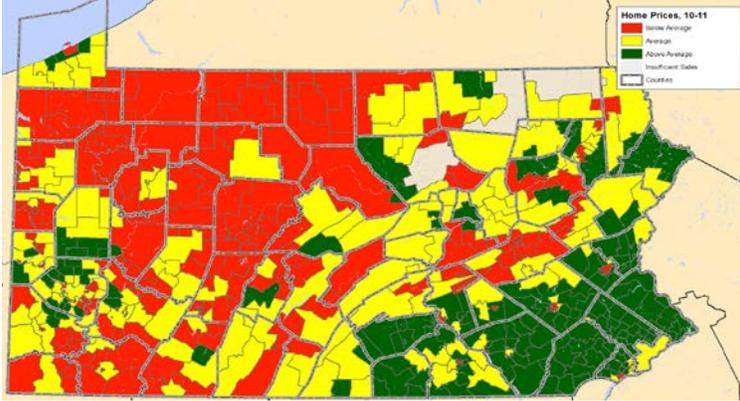
Δy = the change in average home sales prices in District i, from 2010-11 to 2014-15;
 y_{t1i} = average home sales prices in District i, in 2010-11, transformed using a natural log;
 Sx_i = the percentage of all students in grades 3 to 8 who scored proficient or advanced on the Math or Reading PSSA during 2009-10 and 2010-11 school years;
 Pz_i = the overall change in population in District i from 2010 to 2015;
 Uz_i = the change in the percentage of unemployed residents in District i from 2010 to 2015 converted into a standardized z-score;
 Gz_i = the geographic category for District i—urban, suburban, small town, rural;
 e = the error term.

For average home sales prices in 2010-11 a natural log transformation was used to normalize the distribution of average home values observed in school districts across the state.

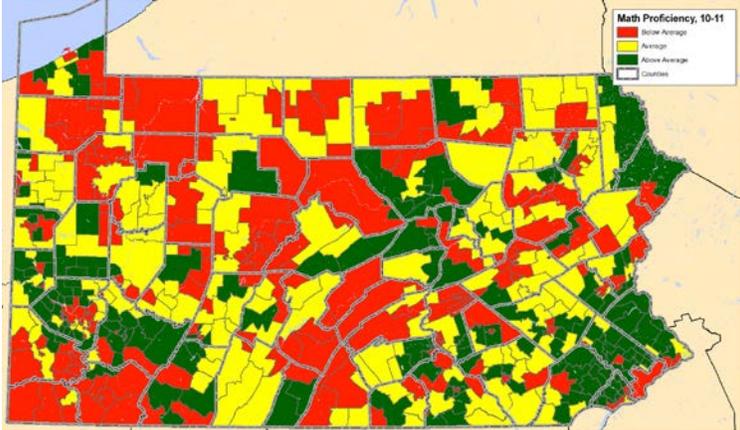
A three-year lag was used to assess the relationship between school performance and home prices since home buyers who care about school quality will likely not have access to the most current school performance levels, and will tend to rely on prior performance when considering the quality of schools.

Appendix A: Average District Home Prices and Performance

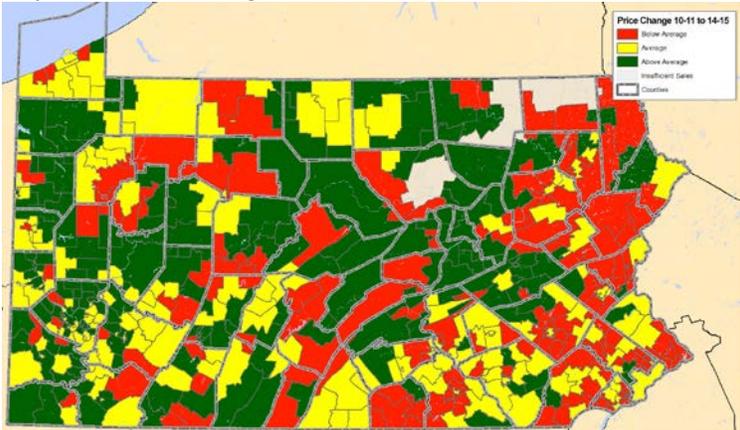
Map 1: Home Prices, 2010-11



Map 2: Math Performance, 2010-11



Map 3: Home Price Change, 2010-11 to 2014-15



In much the same way that school districts influence housing markets, housing markets also influence school districts. Maps 1 and 2 show average home prices and math performance in each district across Pennsylvania. Districts shaded red had below-average prices or performance (they were in the bottom quartile of all districts), districts shaded green had above-average prices or performance (they were in the top quartile of all districts), and districts shaded yellow had average prices or performance (they were in the middle 50% of all districts).

Comparing Maps 1 and 2, it is clear that there is a strong relationship between price and performance. Districts with above-average home prices (shaded green in Map 1) are often the same districts with above-average math performance (shaded green in Map 2).

Map 3 shows the average change in home prices between 2010-11 and 2014-15 in each school district. Again, districts shaded green exhibited above-average changes, districts shaded red had below-average changes, and districts shaded yellow had average changes.

Comparing Maps 1 and 3 illustrates the “ceiling effect” influencing changes in home prices. Districts with above-average home prices in 2010-11 (shaded green in Map 1) often had below-average changes in home prices between 2010-11 and 2014-15 (shaded red in Map 3). Since these districts started off with high home values, there was less room to grow, and in some cases more room for prices to fall. We statistically account for the ceiling effect in our model by controlling for the prices of homes in 2010-11. This helps account for the slower home price growth in already high-priced districts.

The relationship between Maps 2 and 3 is more subtle and difficult to parse. Some high-performing districts also had high home price growth, while others had average or below-average growth. This is a consequence of the many other mediating factors outside of school performance that also influence home values. We account for these other factors by including variables like changes in population, unemployment, and location in our regression models to help draw out the relationship between school performance and home prices, independent of these other influences.

Appendix B: Associations Between Changes in School Performance and Changes in Home Prices

Another way to assess the relationship between school performance and home sales prices is to examine the way changes in school performance influence changes in home sales prices over time. Within the study period there was not enough variation in changes in district-level performance to statistically assess whether changing performance exerted an observable influence on changing home sales prices. On average, the percentage of students scoring proficient or above in math and reading declined by two percentage points across all districts in the state, and over half of all districts experienced changes in proficiency between a four percentage point decline and a one percentage point gain.

However, at the extremes it is possible to discern a relationship between changes in proficiency and changes in home sales prices between 2010 and 2014. The 50 school districts that improved their PSSA math performance by two percentage points or more experienced an average rise in home sales prices of \$2,082. The 50 school districts where students’ math performance declined by at least 8.5 percentage points, experienced an average decline in home sales prices of \$2,437. Although the nature and magnitude of the difference between the top- and bottom-performing districts based on performance is what one might expect, with so few districts at the extremes ***the differences between the top-performing and lowest-performing districts are not statistically significant.***

However, over a longer time period, greater variation in changes in performance and changes in home sales prices may provide opportunities to assess the statistical significance of how these factors influence one another over time.

Table 1: Sample of Districts with Substantial Gains and Declines in Performance and Home Prices

Districts with Substantial Declines in Math Performance and Home Sales Prices	Districts with Substantial Gains in Math Performance and Home Sales Prices
Chester-Upland School District	Benton Area School District
Erie City School District	Canton Area School District
Freedom Area School District	Eastern York School District
Hanover Area School District	Fort Leboeuf School District
Northern Cambria School District	Oswayo Vally School District
New Castle Area School District	South Eastern School District
Pottstown School District	Southmoreland School District
Reading School District	Tuscarora School District
Union School District	West Middlesex Area School District
Valley View School District	Wilmington Area School District

Appendix C: Regression Model Results

Change in Prices (10-11 to 14-15) = Pre School Performance + Log(Pre Home Sales) + Change Unemployment + Change Population + Location

Math Share Proficient/Advanced

Outcome: Change in Sales Prices Between 2010-11 and 2014-15

	Estimate	Std. Error	t value	Pr(> t)
Intercept	\$164,435.44	20501.65	8.021	0.000 ***
Math Adv/Prof (2010-11)	\$513.25	144.50	3.552	0.000 ***
log(Average Home Sale Price, 2010-11)	-\$17,668.28	2200.25	-8.030	0.000 ***
Change Unemployment (2010-11 to 2014-15)	-\$1,381.73	931.86	-1.483	0.139
Change Population (2010-11 to 2014-15)	\$1.15	0.67	1.708	0.088 .
LOC_Rural	-\$5,699.86	5432.70	-1.049	0.295
LOC_Suburb	-\$7,178.99	2771.51	-2.590	0.010 **
LOC_Town	-\$5,027.09	2831.47	-1.775	0.076 .

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 19680 on 482 degrees of freedom
Multiple R-squared: 0.1746, Adjusted R-squared: 0.1626
F-statistic: 14.56 on 7 and 482 DF, p-value: < 0.00000000000000022

Reading Share Proficient/Advanced

Outcome: Change in Sales Prices Between 2010-11 and 2014-15

	Estimate	Std. Error	t value	Pr(> t)
Intercept	\$183,806.01	21203.52	8.669	0.000 ***
Reading Adv/Prof (2010-2011)	\$620.01	136.36	4.547	0.000 ***
log(Average Home Sale Price, 2010-11)	-\$19,778.25	2299.43	-8.601	0.000 ***
Change Unemployment (2010-11 to 2014-15)	-\$1,003.40	933.25	-1.075	0.283
Change Population (2010-11 to 2014-15)	\$1.21	0.67	1.814	0.070 .
LOC_Rural	-\$4,281.61	5384.93	-0.795	0.427
LOC_Suburb	-\$7,127.79	2742.89	-2.599	0.010 **
LOC_Town	-\$4,948.45	2800.94	-1.767	0.078 .

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 19520 on 482 degrees of freedom
Multiple R-squared: 0.1878, Adjusted R-squared: 0.176
F-statistic: 15.92 on 7 and 482 DF, p-value: < 0.00000000000000022

Math Share Below Basic

Outcome: Change in Sales Prices Between 2010-11 and 2014-15

	Estimate	Std. Error	t value	Pr(> t)
Intercept	\$199,587.75	25479.79	7.833	0.000 ***
Math Below Basic (2010-2011)	-\$756.65	248.62	-3.043	0.002 **
log(Average Home Sale Price, 2010-11)	-\$16,639.94	2136.46	-7.789	0.000 ***
Change Unemployment (2010-11 to 2014-15)	-\$1,535.39	932.26	-1.647	0.100
Change Population (2010-11 to 2014-15)	\$1.14	0.68	1.691	0.092 .
LOC_Rural	-\$6,365.18	5461.14	-1.166	0.244
LOC_Suburb	-\$7,595.76	2772.31	-2.740	0.006 **
LOC_Town	-\$5,157.23	2843.80	-1.814	0.070 .

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 19740 on 482 degrees of freedom
Multiple R-squared: 0.169, Adjusted R-squared: 0.1569
F-statistic: 14 on 7 and 482 DF, p-value: < 0.00000000000000022

Read Share Below Basic

Outcome: Change in Sales Prices Between 2010-11 and 2014-15

	Estimate	Std. Error	t value	Pr(> t)
Intercept	\$218,024.54	26898.70	8.105	0.000 ***
Reading Below Basic (2010-2011)	-\$775.90	210.88	-3.679	0.000 ***
log(Average Home Sale Price, 2010-11)	-\$17,965.94	2220.25	-8.092	0.000 ***
Change Unemployment (2010-11 to 2014-15)	-\$1,271.58	936.88	-1.357	0.175
Change Population (2010-11 to 2014-15)	\$1.17	0.67	1.742	0.082 .
LOC_Rural	-\$5,236.92	5449.06	-0.961	0.337
LOC_Suburb	-\$7,469.89	2759.66	-2.707	0.007 **
LOC_Town	-\$5,192.07	2821.67	-1.840	0.066 .

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 19660 on 482 degrees of freedom
Multiple R-squared: 0.1761, Adjusted R-squared: 0.1642
F-statistic: 14.72 on 7 and 482 DF, p-value: < 0.00000000000000022

Reinvestment Fund has published a range of reports related to housing and market impact. For details, please visit the Reinvestment Fund's Policy Publications site at:

WWW.REINVESTMENT.COM/IMPACT/RESEARCH-PUBLICATIONS

2009

School Quality and Housing Prices



2014

Strategic Property Code Enforcement and its Impacts on Surrounding Markets



2016

Estimating the Supply and Demand for Child Care in Newark, NJ



MARCH 2017

Documenting the Influence of Fund for Quality Investments on the Supply of and Demand for Child Care in Philadelphia



REINVESTMENT FUND

www.reinvestment.com
www.policymap.com

REINVESTMENT FUND is a catalyst for change in low-income communities. We integrate data, policy and strategic investments to improve the quality of life in low-income neighborhoods.

PHILADELPHIA

1700 Market Street, 19th floor
Philadelphia, PA 19103
TEL 215.574.5800

BALTIMORE

1707 North Charles Street
Suite 200B
Baltimore, MD 21201
TEL 410.783.1110

ATLANTA

229 Peachtree Street NE
Suite 750, International Tower
Atlanta, GA 30303
TEL 404.400.1130



real estate



early education



healthcare



healthy food



housing



k-12 education



data & analysis



clean energy

Reinvestment Fund is an equal opportunity provider.