An Analysis of Two Educational Policy Changes in New York State: Performance Standards and Property Tax Relief

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Abstract

This paper examines two educational policy changes in New York state: performance standards, which are designed to boost performance, particularly in troubled districts; and school property tax relief, which is designed to offset the state's high property tax burden. Our analysis pays particular attention to variation in educational costs across districts and to school districts' responses to policy change.

A school district's performance can be moved toward a standard by improving the district's efficiency, increasing the district's property tax rate, or increasing the district's state aid. We find that raising efficiency up to the current "best-practice" level would not be sufficient to bring many districts up to even minimal performance standards. Moreover, without increases in aid or efficiency, many districts could not reach performance standards without a dramatic increase in their tax rate. In principle, a performance-based foundation aid system could help low-performing districts reach a standard. However, New York City currently receives so little aid, despite its relatively high costs and low wealth, that such an aid system would require a major shift of funds to the City and, without a significant increase in the state aid budget, would result in a significant decline in aid in all but the neediest districts. Moreover, even with performance-based foundation aid, significant performance improvements in large cities would require large increases in local property tax rates.

The School Tax Relief program, STAR, passed in 1997, provides a significant school tax reduction for homeowners through a new property tax exemption that is funded by the state. The initial STAR property tax savings create significant inequity across taxpayers. Moreover, they are skewed toward higher-wealth school districts, and therefore undermine the decades-long effort in New York state to make the school finance system more equitable. STAR also will have some unintended consequences. Because the homestead exemption results in a large drop in local voters' share of any school property tax increase, it will result in higher school tax rates, and hence in higher taxes on commercial and industrial property, including rental housing. Some of these tax increases may be passed on to workers, consumers, and renters. The tax-freeze aid provision in STAR involves far too little funding to prevent this from happening. Moreover, the STAR-induced property tax increases will boost the cost of the program to the state to about $2.8 billion per year, which is 25 percent above the official estimate. The paper concludes with a set of recommendations to eliminate these problems with STAR.

Introduction

The 709 public school districts in New York State, which served about 2.8 million students in 1995, range from the huge and varied New York City district to the three big upstate city districts to rich suburban districts on Long Island to small rural districts with fewer than 100 pupils. Despite local property tax rates that are, on average, among the highest in the country, this variety ensures that educational outcomes differ widely from one district to the next. Some districts receive national acclaim for their students' performance, while others struggle to bring their students up to minimal standards.

The poor educational performance of many districts and the high property tax rates have been a cause of concern to state policymakers for many years. This paper examines two policy changes that have been proposed or implemented in recent years, one, performance standards, designed to combat the first problem and the other, property tax relief, designed to combat the second. In particular, we explore the impact of these changes on educational outcomes and property tax rates, focusing on the behavioral responses of school districts. In addition, we explore the interaction between these reforms and a third type of change, namely a revised state aid formula designed to bring all districts up to a minimum performance.

The Analytical Framework

The analytical framework of this paper is based on three equations: a cost equation, a demand equation, and an efficiency equation. This section explains our approach to measuring performance, provides an intuitive explanation of each equation, and discusses of our method for simulating alternative educational policy reforms.

Measuring Performance

The performance of a school district can be measured in many ways, each of which has limitations. Most scholars measure performance by selecting, on a priori grounds, a single performance indicator, such as an average test score. Our approach attempts to capture a broader range of school activities by determining which performance indicators are valued by voters, as indicated by their correlation with property values and school spending. Our approach, which is

explained in detail in Duncombe and Yinger (1997), results in an index of educational performance. This index is a weighted average of the performance indicators that are found to be statistically significant, where the weights reflect the value voters place on each indicator.[1]

When applied to data for New York state, this approach results in an educational performance index based on three performance indicators: the average share of students above the standard reference point on the third- and sixth-grade PEP tests for math and reading, the share of students who receive Regents diplomas, and the graduation rate. These indicators cover a wide range of school district activities, including both elementary and secondary education programs and programs that focus on both retention and academic performance. Although we use an objective, statistically based procedure to select these indicators, they do not, of course, summarize all educational activities by a school district. The reader should be aware that all the analysis in this paper is based on this performance index and therefore ignores school districts' performance using other indicators. The general principles we illuminate would, we believe, still hold for many other sets of indicators, but all of our specific conclusions depend on the specific performance index we employ. Perhaps the key point for policy makers to keep in mind is that they cannot measure performance or design programs to promote it without selecting specific performance indicators. Our approach is by no means the only way to make this selection, but one cannot avoid the selection process.

The Cost Equation

One of the most central ideas in the educational finance literature is that the cost of providing education depends not only on the cost of inputs, such as teachers, but also on the environment in which education must be provided. A harsher environment, characterized by high rates of poverty and single-parent families, for example, results in a higher cost to obtain any given performance level. Just as the harsh weather "environment" in upstate New York ensures that people who live there must pay more during the winter time than do people in southern states to maintain their houses at a comfortable temperature, the harsh educational "environment" in some school districts, particularly in big cities, ensures that those districts must pay more than other districts to obtain the same educational performance from their students.

The concept of a harsh environment is clearly recognized in The State Education Department's report on the status of the state's schools (The University of the State of New York, 1997, p. 3), which says "Five indicators, each associated with poor school performance, are useful for identifying students at risk of educational disadvantage: minority racial/ethnic group identity, living in a poverty household, having a poorly educated mother, and having a non-English language background." An hint about the powerful role played by poverty also appears in this report in a table (Table 5.16, p, 128) indicating how one key performance measure, the percentage of third-graders above a standard reference point on the State's reading exam, falls as the poverty concentration in a school rises. Specifically, 90.5 percent of the students score above this point in schools with a poverty rate below 20 percent, but only 58.9 percent of students do so when the school poverty rate is above 80 percent. Despite this recognition of the importance of the cost environment, the State currently makes no attempt to identify all important environmental cost factors or systematically estimate their effects, and current state aid formulas account for such factors only in an ad hoc manner.

Our approach identifies important input and environmental cost factors and estimates their impact on educational costs. The details are presented in the Appendix, Table A1. In particular, we find that educational costs in New York state are influenced by the cost of the main input, namely teachers, and by four environmental cost factors: district enrollment, the percentage of children in poverty, the percentage of households headed by a single female, and the percentage of students with limited English proficiency. The estimated cost impact of teachers salaries recognizes that these salaries reflect not only labor market conditions, over which a school district has no control, but also a district's generosity in wage setting. Thus, we use an estimating procedure that limits the impact of salaries to the variation associated with underlying labor market conditions. The estimated impact of district enrollment is nonlinear. Following many previous studies, we find that the relationship between cost per pupil and enrollment is U-shaped, with relatively high costs in both the smallest and the largest districts.[2] Finally, we also recognize that costs depend on the number of students with disabilities, and measure this effect with the percentage of students with a severe handicap. Because expenditures for students with disabilities are so high in some districts, we include this variable in our cost calculations even though it is not statistically significant at conventional levels.[3]

On the basis of our regression results, we combine these input and environmental cost factors into a cost index, which indicates how much a district must spend to achieve the same performance (as measured by our index) as a district with average costs (see Duncombe and Yinger, 1997). An index value of 100 indicates average cost, for example, whereas an index value of 200 indicates that a district must spend twice the average amount to get any given performance result. Cost indexes by type of district are presented in Table 1. Upstate suburbs have the lowest average cost index at 90.9, and New York City has the highest cost index, namely 347.8. The three large upstate cities also have high costs, with an average index of 175.5.

It should be pointed out that these indexes are not driven by New York City. A regression analysis that excludes New York City results in cost indexes, both for the City and for other districts, that are similar to the indexes in Table 1. In fact, such a regression actually results in a somewhat higher index for the City. The plain fact is that, as shown in Table 1, the City faces both high labor costs and the harshest educational environment in the state; its costs are relatively high no matter which sample is used for the regression analysis.

The Demand Equation

An enormous literature establishes that the choices made by local school officials are heavily influenced by the preferences of voters. In particular, a school district's choices reflect the underlying demand for educational performance on the part of voters, as determined by their incomes and by what they must pay to obtain an increase in school performance. The latter variable, called the tax price, varies across districts for three reasons. First, some districts have higher costs than others, and therefore must spend more to obtain the same performance. Second, some districts are more inefficient than others, and therefore waste more of any increase in revenue (at least for the purpose of improving our outcome index). Third, some districts contain relatively extensive commercial and industrial property, which allows them to raise a given level of taxes with a relatively small burden on residents. This third factor is called the voter tax share; the higher the tax share, the higher the price of education.

In addition, voter demand for educational performance depends on state aid; the higher the aid, the greater the desired spending. Although an increase in aid is similar to an increase in income,

many studies have established that aid increases have a greater impact on district spending than do comparable increases in income. This is known as the flypaper effect; money "sticks where it hits."

The demand equation plays an important role in our analysis because many of the policies we simulate involve a change in state aid for many districts and therefore lead to a change in the performance level preferred by voters in those districts. Moreover, STAR changes the share of local property taxes that local voters must pay and therefore alters tax prices, again in different ways for different districts. These types of policies therefore lead to potentially large changes in the performance level preferred by voters and ultimately in actual school district performance. Our demand equation allows us to estimate what these changes are likely to be.

The Efficiency Equation

The third equation examines the determinants of school district efficiency, as measured using a "best-practice" technique. With this technique, a district is said to be inefficient if it spends more on education than other districts with the same performance and the same educational costs. The degree of inefficiency is measured by the extent of this excess spending. Although the "best-practice" technique we use, called data envelopment analysis or DEA, is well known, we are the first to use it in a comprehensive analysis of school district responses to educational policy reforms. As a result, this is the most exploratory part our analytical framework.

To keep our efficiency results in perspective, it is worth emphasizing that they depend both on our method for estimating efficiency and on our definition of performance. In other words, we explore the impact of various policy changes on best-practice efficiency in delivering educational performance as measured by our index. So far, scholars have not identified any other approach to efficiency that can be employed in an analysis of school district behavior, but our approach is not without limitations (see Duncombe and Yinger, 1997), so further research on this topic clearly is warranted. Moreover, other scholars might prefer to apply our approach to efficiency to a different performance index.

We find that efficiency measured in this way is influenced by many school district characteristics. Detailed results are presented in the Appendix, Table A2. For the purposes of our simulations, two types of results are particularly important. First, efficiency is influenced by a

district's state aid. In particular, districts are more efficient if (a) they receive less aid per pupil than other districts in their enrollment/property value class or (b) if they are in an enrollment/property value class that receives a relatively low amount of aid per pupil.[4] These results indicate that districts make extra efforts to keep up with comparable districts that are receiving more aid and that classes of districts receiving the least aid are forced to find additional ways to cut their expenses without sacrificing performance.

Second, efficiency is influenced by the share of any additional dollar of revenue that must be contributed by voters, which, as noted earlier, is called the tax share. The larger the tax share, the greater the bite that any tax increase takes out of voters' pocketbooks. A large tax share fosters voter vigilance and therefore promotes efficiency on the part of school administrators.

Simulation Methodology

These three equations allow us to simulate the impact of many different educational policies on educational performance, local tax rates, and school district efficiency. Policies that influence a district's lump-sum aid, for example, influence its educational performance both directly (through the aid effect) and indirectly (through their impact on efficiency). The same is true for policies that influence a district's tax share. A higher tax share directly lowers educational performance and results in more district efficiency, which has an additional impact on performance. Moreover, our analysis of costs and efficiency allows us to determine what changes in spending or in efficiency would be necessary to achieve any given performance target. Except where noted, our simulations also are budget neutral, in the sense that they simply redistribute the existing state aid budget.[5]

An Analysis of Performance Standards

Educational performance standards are now under active discussion at both the national and the state level. New York State has long been a leader in this debate because of its Regents Exams, which set implicit standards for success in high school. Moreover, the recent implementation of district report cards highlights district performance and facilitates a discussion of the standards that each district should be expected to reach. The Regents have been exploring the possibility of issuing more explicit performance standards, but have not yet determined whether to take this step, how to set these standards, or how to ensure that districts meet them.

The academic literature on standards is limited. One scholar, Bishop (1997), argues that clearly articulated standards can boost performance. In fact, on the basis of a statistical analysis of SAT scores in the United States, Bishop argues that the relatively high performance on SATs of students in New York state can be attributed in part to the existence of Regents exams.

A full analysis of performance must consider many issues. How can a system of standards avoid encouraging schools to "teach to the test"? Will a standard imposed on one performance indicator, such as Regents diplomas, lead to poorer performance on competing indicators, such as the graduation rate, or to accompanying performance increases on complementary indicators, such as PEP scores? This type of full analysis is beyond the scope of this paper. Instead, we will use our analytical framework to explore the magnitude of the task facing school districts and state policy makers if they want to bring low-performing districts up to a higher standard.

How Can a District Meet a Performance Standard?

Acting on their own, the only ways for low-performing school districts to reach a performance standard are (1) to raise their property tax rate and use the funds to purchase better performance, (2) to improve the efficiency with which they use their resources, or (3) some combination of the two. Our analytical framework does not allow us to determine how districts can find the political resources needed to raise their tax rates, nor does it show how they can improve their management practices so as to be more efficient. However, this framework does reveal the extent of the tax-rate or efficiency changes that would be necessary to meet a general performance standard.

We focus on operating spending, not total spending, and define the "local contribution rate" as the tax rate levied by a district in support of its operating budget. We then examine the increase in this tax rate required to bring each district up to three given standards, namely the 25^{th}, 50^{th}, and 75^{th} percentiles of the current performance distribution, as measured by our performance index. Recall that this index is based on elementary test scores, Regents diplomas, and graduation rates. Obviously, districts with higher costs (or higher inefficiency) will have to spend more to obtain any given increase in performance, districts that are far from the standard will have to spend more to reach it than other districts, and districts with relatively small property tax bases will have to raise their tax rates more than districts with relatively large bases.

Our results are presented in the first three columns of Table 2. The first panel of this table applies to a standard set at the 25th percentile of the current performance distribution. Most districts meet this standard, of course, but some districts in virtually every class do not. The second column indicates the average tax rate in each class of district if every district in the class raised enough money to meet the standard; the third column indicates the associated tax rate change over existing rates. Small-city, suburban, and rural districts would face relatively small tax increases, on average, but large cities would have to at least double their tax rate to have enough revenue to meet the standard. Even to meet this minimal standard, New York would have to increase its property tax rate by 312 percent. The fourth column of Table 2 reveals that the required tax increases in large cities also would be relatively high if expressed as a percentage of a district's median income.[6]

The next two panels examine higher standards. In the last panel, which refers to a standard set at the 75th percentile of the current performance distribution, all districts except suburbs would have to at least double their tax rates to meet the standard, and New York City would have to increase its rate by 534 percent. As before the required tax increases also are a relatively high percentage of income in large cities; indeed, expressed this way the increase is over 17 times as high in New York City as in its suburbs.

The second possibility mentioned above is for districts to become more efficient. We address this issue by raising the efficiency of all low-performing districts up to the highest level observed in current practice. It is theoretically possible for efficiency improvements beyond this point to be obtained, but since they would be outside the experience of any districts in the state, we do not examine them. The results are presented in the last three columns of Table 2. Small, downstate cities, for example, now reach 91.85 percent of the first performance target, on average. If these districts were all "perfectly" efficient, they would all be able to reach this target. The same cannot be said for large cities. New York City and Yonkers now reach about one-third of this minimal performance standard, but would still not even reach half of this standard if they were as efficient as current practice allows. Similar efficiency improvements would bring the large upstate cities only up to three-quarters of the standard. The next two panels of this table reveal that efficiency changes alone leave all districts even farther from higher performance standards. For example, best-practice efficiency would not bring New York City and Yonkers even up to one-third of the highest standard.

Can a Revised State Aid Program Help Districts Meet a Performance Standard?

A performance standard might induce low-performing districts to boost their performance by raising their taxes or improving their efficiency, but given the magnitude of the required changes, it seems unlikely that such efforts could be sufficient to reach the standards. An alternative, to which we now turn, is to combine a performance standard with aid changes designed to ensure that every district has the resources needed to meet it.

The type of aid program we consider is called a foundation plan and is used by 80 percent of the states, including New York.[7] However, our foundation plan, unlike the actual plan in any state, systematically account for cost differences across districts. Existing plans, including New York's, are designed to bring all districts up to a minimum spending level per pupil. Because they do not systematically account for cost differences across districts, these plans do not bring all districts up to a minimum performance level. Moreover, many existing foundation plans, again including New York's, have hold-harmless provisions or minimum aid amounts that limit their ability to bring all districts up to an adequate spending level per pupil, let alone adequate performance. Our aid programs do not contain any such provisions. For a detailed explanation of the design of a performance-based foundation plan, see Duncombe and Yinger (1997).

A foundation aid program is designed to provide every district with enough resources so that it would have enough revenue to provide the foundation level of spending per pupil, or in our case, of performance, at a tax rate specified by policy makers. Districts that are wealthy enough to raise the required revenue by themselves simply by setting this specified tax rate receive no aid from the state. We make the switch from spending to performance by bringing in the cost index derived from our estimated cost equation. This index allows us to determine how much a district with a certain cost level would have to spend to achieve a performance target. The amount of aid this district receives equals this spending level minus the amount of revenue it can raise at the specified tax rate.

The 1996 New York state aid programs include several provisions that could be interpreted as ad hoc cost adjustments. The first is that the operating aid, which provides 53 percent of the total aid paid to school districts, is based on the number of "weighted" pupils in a district. Pupils with extra weights include pupils in secondary school and pupils with "special education needs," defined as students who score below the minimum competency level on the third and sixth grade reading or

math PEP tests.[8] The first of these weighting factors is supported by some studies of school spending in other states (see, for example, Ratcliffe, Riddle, and Yinger, 1990), which find a higher cost for high school than for elementary school students. However, it is not supported by our analysis of data for New York state, which finds no cost differences by grade. The second factor is undoubtedly correlated with cost variables, but we believe it is inappropriate to include a performance measure based on PEP scores in an aid formula. This approach rewards districts for poor performance and gives them an incentive to perform poorly in the future. Aid formulas should be based on factors outside a district's control, such as concentrated poverty, that make it difficult for the district to reach a high performance standard, but not on performance indicators that are influenced by the district's actions. New York also has a relatively new program, called Extraordinary Needs Aid, which gives more aid to districts with lower incomes and higher poverty concentrations. The program provides less than 5 percent of the total aid budget, and the formula is ad hoc, i.e., it is not based on any estimate of the relationship between educational costs and poverty. Overall, therefore, these programs do a poor job accounting for cost differences across districts.[9]

Even with an aid program that accurately accounts for cost factors, a district can fall short of the foundation level of spending or performance either because it is inefficient or because it sets a tax rate that is below the specified rate. Because virtually all districts fall short of the best-practice efficiency level, we design our foundation formula so that every district will have enough revenue to achieve the foundation performance level if it at least reaches the 75^{th} percentile of the current efficiency distribution across districts, which we call the baseline efficiency level. If it falls short of this level, it will not achieve the foundation level of performance unless its tax rate is above the specified rate.

We examine aid programs with three different standards, namely the 25^{th}, 50^{th}, and 75^{th} percentiles of the current performance distribution, as measured by our outcome index. The impact of these aid programs depends primarily on four key issues:

First, additional aid makes it possible for a district to maintain its current service level while cutting back on local property taxes. In most states, but not New York, foundation plans are accompanied by a required minimum local tax rate to prevent such a cut back, and without a minimum-tax-rate provision, the stimulative impact of state aid is minimal. We examine aid

programs with and without a minimum-tax-rate provision. Our version of the minimum-tax-rate provision has two parts. (a) All districts that receive foundation aid must set their tax rate at or above the rate specified in the foundation formula. (b) All districts that are too wealthy to receive foundation aid must set their tax rate at or above the rate required for them to reach the foundation level of performance at the baseline level of efficiency. This minimum rate will be below the rate imposed on districts that actually receive foundation aid.

Second, performance is influenced by the generosity of the state aid program. As explained earlier, aid raises voters' desired performance level and hence raises school district performance. However, additional aid does not simply go into higher performance, it also leads to local tax reductions, so the impact of aid on performance may not be large. We examine aid programs using the 1990-91 New York State aid budget and twice this amount. Note that these first two issues interact because the generosity of the state aid program determines the property tax rate needed to reach any performance target; the more generous the aid, the lower the required rate.

Third, as explained earlier, aid programs influence school district efficiency. In general, the more aid a district receives, the less efficient it will be. Thus, a policy to improve the performance of low-performing school districts with more state aid is analogous to a leaky bucket; some of the aid these districts receives is lost in the form of higher managerial inefficiency. This principle applies not only to a redistribution of aid toward needier districts, which makes those districts less efficient, but also to an increase in the state aid budget with a given formula, which makes all districts less efficient. We are not, of course, the first scholars to point to the leaks in the aid bucket, and in fact some scholars think that it is much leakier than we do. See Hanushek (1996).

Fourth, the impact of any aid program in New York state is heavily influenced by the situation in New York City. Because New York City is such a needy district, with both the highest costs in the state and relatively low property value per pupil, any redistribution toward the neediest districts will increase New York City's aid per pupil. Moreover, because New York City has such a high enrollment, any increase in its aid per pupil will consume a large share of the state aid budget. At the current time, New York State deals with this issue by giving New York City significantly less aid per pupil than it gives the average district ($2,747 compared to $3,623 in 1995-95; see The University of the State of New York, 1997). In contrast, our aid systems are driven by the principle

that all districts should be brought up to a minimum performance standard, so New York City's aid per pupil is above average and less is left over for other districts.

Table 3 presents our predicted performance for each type of school district under various aid plans. The columns refer to the two different state budget levels and to plans with and without a minimum-tax-rate requirement. The three panels refer to the three different standards. Current outcomes, based on our index, are given in the first column.

A comparison of the first and second columns indicates that changing from the current aid formula to a performance-based foundation plan would actually lower outcomes in all types of districts except New York City. This result reflects the facts that a performance-based aid program, unlike the current one, recognizes the high costs and low capacity of New York City and that raising the aid per pupil to the City uses up a large share of the state aid budget. In fact, as shown in Table 4, aid per pupil declines in all classes of district except New York City, and indeed declines to zero in some classes of district. The only other districts with significant aid per pupil are the large upstate cities.

Imposing a minimum tax rate, in the third column of Table 3, enlists each school district in the effort to reach the performance standard. Because the state aid program is relatively ungenerous and so much money flows to New York City, the required local contribution is very large. Table 5 shows that a minimum-tax-rate requirement results in a higher local tax rate, on average, in every class of district. Not surprisingly, low-performing districts, such as the big cities, face particularly large rate increases. In fact, New York City and most of the upstate big cities are pushed all the way to the minimum tax rate in the foundation formula, which, for the highest standard, is almost five times the current New York City tax rate.

These large local contributions result in performance increases in every class of district. See Table 3. The resulting performance levels fall short of the standard in the big cities, however, because efficiency in the big cities falls short of the baseline efficiency in the formula. The large upstate cities fall just short of this efficiency level so they reach a performance that is about 94 percent of the standard in every case, but the higher inefficiency in New York City and, especially, Yonkers, keeps their performance farther below the standard.

Adding up these local tax increases across all districts reveals that it would cost taxpayers in the state about $16 billion to bring all districts near the lowest performance standard, with some

gaps remaining because some districts do not meet the baseline efficiency built into the formula. Similarly, it would cost taxpayers in the state about $25 billion to bring all districts near the middle performance standard, which is the median of the current performance distribution, and about $35 billion to bring all districts near the highest performance standard. Policy makers in New York state should be aware that performance standards cannot be achieved without tax or aid increases of this magnitude.

Doubling the state aid budget shifts the burden of financing the standard away from the local governments toward the state. Thus aid increases to every class of district (Table 4, 5th column compared to 3rd column) and results in aid that is higher than current aid for the upstate large cities as well as for New York City (5th column compared to 1st column). Moreover, local tax rates are lower without a minimum-tax-rate requirement (Table 5, 4th column compared to 2nd column) and with a minimum-tax-rate requirement (5th column compared to 3rd column). In addition, doubling aid significantly lowers the minimum tax rate in the foundation formula, which can be seen by comparing the results for New York City in the 5th and 3rd columns of Table 5. The net impact of a higher state budget on the local share of educational spending is documented in Table 6.

Without a minimum tax rate, doubling the state aid budget results in an increase in performance in every class of district as the aid dollars are used to boost recipients' performance. See Table 3 (4th column compared to 2nd column). Some of the aid increases also go to tax relief, however, and the higher aid also results in lower district efficiency. As a result, the net performance increases are not nearly sufficient to bring low-performing districts up to the foundation level. The efficiency effects of aid are summarized in Table 7.

With a minimum-tax-rate requirement, only the inefficiency effect on performance appears. In this case, higher aid simply shifts the tax burden from local to state taxpayers (Table 6) without altering the amount of revenue available to each district. Because it raises aid in every class of district, doubling the state aid budget increases inefficiency in every class of district, and, as shown in Table 7 (5th column compared to 3rd column), therefore lowers performance in every class of district. Performance in large upstate cities, for example, falls from 94 to 79 percent of the foundation level.

Conclusions

Performance standards are designed to encourage improved school district performance, especially in the districts that are currently at the bottom of the performance distribution. A school district's performance can be moved toward a standard in one of three ways: improving the district's efficiency, increasing the district's property tax rate, and increasing the district's state aid.

However, these changes face severe limits in their ability to help students in low-performing school districts in New York state. Raising efficiency up to the current "best-practice" level would not be sufficient to bring many districts up to even minimal performance standards. Even if the large central cities could become this efficient, their performance would still fall 40 percent below the current median performance in the state. Without increases in aid or efficiency, many districts could not reach performance standards without a dramatic increase in their tax rate. In fact, tax rates would have to double in the large upstate cities and quadruple in New York City for these districts to reach the current median performance level.

In principle, a performance-based foundation aid system could help low-performing districts reach a standard. However, such a system would involve a significant change in the distribution of aid in the state, and in particular a significant change in the aid to New York City. Because the City has relatively high educational costs and low wealth per pupil, a performance-based aid system would give it far-above-average aid per pupil, not below-average aid as in the current system. Because the City has so many students, this change would consume a large share of the state aid budget and, at current funding levels, would leave little money for assisting other districts. Indeed, without a significant increase in the state aid budget, shifting to a performance-based foundation aid system would result in a significant decline in aid in all but the neediest districts.

The ability of aid increases to boost performance in large cities is limited because it would induce districts to cut their own tax effort and to become less efficient. Increasing aid to New York City by 2 ½ times, for example, would result in an 20 percent drop in its tax effort and a 10 percent drop in its efficiency, so that its performance would go up by only about 35 percent.[10] Declines in tax effort can be prevented through minimum-tax-rate provisions, but, with the current state aid budget, significant performance improvements in large cities would require large increases in local property tax rates. Even with a performance-based foundation aid program, for example, New York

City would have to increase its tax rate by over 3 ½ times to reach the state's current median performance level. The resulting high tax rates might compromise cities' ability to provide other essential services.

Any effort to achieve a minimum performance standard in all districts therefore faces a tradeoff between the equity gains and efficiency losses associated with increased state financing. The burden of financing the state's educational system is distributed more equitably across school districts if the state, with its broad tax bases, provides more of the revenue; however, an increase in state revenue is likely to lower the efficiency with which educational performance is delivered. The current state share is probably too low on fairness grounds, but any increase in state funding should be accompanied by management assistance or monitoring to minimize efficiency losses (a step not taken in the program to which we now turn) .

An Analysis of the School Tax Relief Program

Local property taxes in New York state are among the highest in the nation. This heavy reliance on the property tax combined with a wide range in wealth per pupil across districts is a major source of existing disparities in educational funding. It is not surprising, therefore, that many policy makers have focused on property tax relief as a way to reform educational finance in the state. Indeed, the most significant change in educational finance in recent years, the School Tax Relief program, STAR, is a property tax relief program passed in 1997. STAR has profound implications both for the equity of the tax system across taxpayers and for educational equity across districts. Moreover, it will have some unanticipated impacts on student performance, district efficiency, and local property tax rates. This section provides our analysis of these effects.

Description of STAR

The main feature of STAR is a property tax exemption that will reach, in 2001, a base amount of $30,000 for the owners of owner-occupied one- to three-family houses, mobile homes, condominiums, and cooperative apartments or $50,000 if the owner is aged 65 or older with an income below $60,000. School districts must provide this exemption and the state will reimburse them for its cost. To give a simple example, consider a house worth $100,000 in a school district with a 1.5 percent property tax rate. Without STAR, the owner of this house pays a property tax of

(.015)×($100,000) = $1,500, but with STAR, this owner's tax drops to (.015)×($100,000 - $30,000) = $1,050, a tax reduction of $450, or 30 percent.

Perhaps the key feature of the STAR exemptions is that the base amount is multiplied by a "Sales Price Differential Factor," which is the ratio of the three-year average sales price of residential property in a district's county relative to the three-year average in the state as a whole. This factor cannot fall below 1.0. Thus, this provision greatly increases the amount of the exemption in counties with high property values. The STAR exemptions also are multiplied by an "Equalization Factor," which accounts for the fact that not all assessing districts assess property at 100 percent of market value.

STAR also sets aside $25 million for a new form of state aid called tax-freeze aid. Although the details of this new form of aid are complicated, it is designed to reward districts that increase their tax levy by less than about 3 percent per year, with the highest aid going to districts that do not increase their levy at all. Strange as it may seem, this "tax-freeze" provision does not even recognize the difference between a tax rate increase and a tax base increase, so a district that succeeds in attracting a new manufacturing plant will be penalized for increasing its tax levy, as will a district that raises its property tax rate.

First-Round Impacts of Star

A property tax exemption promotes equity across taxpayers by lowering the burden of the property tax the most on taxpayers with the smallest property values, and therefore with the least ability to pay. However, STAR's "Sales Price Differential Factor," offsets this equity improvement by giving a larger tax break to taxpayers in higher-wealth counties. The basic exemption in Westchester will be about $72,000, for example, compared to $30,000 in most of the state. We know of no equity principle that can justify this type of break to people in wealthy counties, who, after all, are living there by choice.

STAR also has widely varying impacts across school districts. The immediate property tax savings per pupil from STAR when it is fully implemented are presented in Table 8 for each class of district. The highest savings go to the downstate suburbs and small cities and to Yonkers, and the smallest savings go to New York City and upstate large cities, largely because of their large share of renters.[11] In fact, the per-pupil savings are three times as high in the downstate suburbs as in the

City. Upstate districts fall somewhere in between, with tax savings between $700 and $800 per pupil. Total savings in 1991 dollars, that is, the total cost to the state, comes close to $1.9 billion.

Overall, the STAR benefits are heavily weighted toward districts with higher property values, higher incomes, and better fiscal health. The correlation between tax savings and median income is 0.62, and the correlation with property value is 0.24. The correlation is almost as high, 0.23, between tax savings per pupil and a comprehensive measure of fiscal health that accounts for both educational costs and revenue-raising capacity (see Duncombe and Yinger, forthcoming).

The downstate districts tend not only to have relatively high wealth but also to have relatively high educational costs. Higher tax savings for these districts are appropriate to the extent that they offset cost factors, such as local market wages, that are outside the districts' control. Thus, Table 8 also presents, in column 2, the tax savings for each type of district after adjusting for educational cost differences across districts. As expected, this adjustment brings the savings in the downstate and upstate suburbs much closer together. However, it also magnifies the gap between large city and suburban districts because it recognizes that large cities have many characteristics, such as concentrated poverty, that raise the cost of education. Indeed, New York City's tax savings drop to about 12 percent of the savings in downstate suburbs.

Thus, STAR works against equalization. Given the enormous performance disparities that still exist between high- and low-wealth districts, and between low- and high-cost districts in New York state, this movement away from equalization is entirely inappropriate. We know of no fairness principle that would justify such a move. Indeed, it is profoundly ironic that STAR, the largest change in educational finance in New York in decades, serves to magnify the inequities that are at the heart of the state's educational problems.

Long-Run Impacts of STAR

These first-round effects are only the beginning, however, because school districts will change their behavior in response to STAR. First, and most important, STAR dramatically lowers local voters' share of property taxes. As explained earlier, this share is part of the "price" of educational performance, and a drop in this price induces voters to demand more services. Thus, STAR will lead to an increase in the performance of school districts in New York and, ironically, to a significant increase in local tax rates. Tax payments by homeowners will still fall, of course,

but tax payments by the owners of commercial and industrial property, including rental housing, will rise substantially.

The usual expression for the tax share is the median house value divided by property value per pupil. This expression indicates the dollars that the owner of the house with median value will pay when the district raises taxes enough to collect one more dollar per pupil. With STAR, however, a residential taxpayer pays taxes only on the excess of his property value over the STAR exemption. In other words, one must now subtract the STAR exemption from the numerator to obtain the new tax share expression. Consider a community where the median house value is $100,000 and the property value per pupil is $100,000. Then the standard tax share equals 100,000/100,000 = 1, but the tax share with STAR equals (100,000-30,000)/100,000 = 0.7. In this example, therefore, STAR cuts the tax share, and hence the price of educational performance, by 30 percent. When the price of this or any other service is cut, households will demand more of it. Indeed, a price cut of this magnitude, which is in fact typical of the actual price cuts, will lead to a large increase in voters' desired educational performance—and ultimately in actual performance. In some upstate districts, particularly in rural areas, the price cuts are much higher since the median house value is well below $100,000. Overall, the price cuts range from 11 percent to almost 100 percent of median housing value (in 1990), with an average of 37 percent.

It should be emphasized that this type of response to a price increase is not just a theoretical notion, but has been documented by dozens, if not hundreds, of scholarly papers. For reviews of this literature, see Inman (1979), Rubinfeld (1987), or Ladd and Yinger (1991). A typical finding in this literature is that a 1.0 percent decrease in the tax price of a public service leads to a 0.3 percent increase in the level of that service (which is the same thing as a 0.3 percent increase in spending, holding costs and efficiency constant). Thus a 30 percent cut in tax price, as in the above example, would lead to a 9 percent increase in the service level. Our estimate is very close to this consensus in the literature; using data from New York state, we estimate that a 1.0 percent decrease in tax-price leads to a 0.34 percent increase in educational performance, as measured by our index. (See the Appendix, Table A1).

However, the STAR-induced tax-share changes also have another effect, which offsets, to some degree, the effect of a lower tax price. Many studies have found that the stimulative impact of lump-sum aid depends on the median voter's tax share; the higher this tax share, the greater the

savings to the voter from $1.00 of aid. The large cuts in tax shares caused by STAR therefore lower the stimulative impact of existing state programs. In some cases, this effect offsets a large portion of the direct price effect.

Increases in educational performance are accomplished, of course, through increases in the local budget, through local taxes and/or aid. Our simulations determine the tax-rate increases that would be required to obtain the service levels desired by voters with the STAR tax shares. Despite these tax rate increases, homeowners still face lower tax payments with STAR than without it because the higher rates apply only to property values in excess of the exemptions. However, these tax rate increases will lead to a significant increase in the property taxes paid by taxpayers who do not receive the STAR exemptions, namely the owners of commercial and industrial property, including rental housing. These tax increases may be passed on, to some degree, to workers, consumers, and renters.[12]

Our analysis indicates that the STAR-induced cuts in tax shares have another, presumably unanticipated effect: They will lead to an increase in school district inefficiency. As explained earlier, our empirical analysis reveals that voters put more pressure on their school district to be efficient when they bear a larger share of any tax increase. By cutting tax shares, STAR will reduce the pressure voters place on school districts and will therefore reduce district efficiency. As a result, the STAR-induced tax rate increases will have a bigger impact on school spending than on school performance.

Analysis of these behavioral responses to the STAR property tax exemptions is complicated by two other provisions in STAR: tax freeze aid and a contingency budget cap.[13] Proponents of this tax-freeze aid apparently thought that it would prevent the tax increases that our analysis predicts.[14] We find that this is not the case. The annual budget for the tax-freeze aid is so small, only $25 million, that its financial incentive to hold back on property tax increases is swamped by the financial incentive to increase property taxes associated with the STAR exemptions. We find that about half of the districts will accept tax-freeze aid, but these districts are the ones that would have selected small or no increases in tax rates even without this form of aid. Moreover, the amount of aid these districts receive is so small, that it has virtually no impact on the tax rate they select. Overall, therefore, tax-freeze aid is almost totally ineffective in reducing school tax rates.

The impact of the contingency budget cap is less certain because it only affects growth in the budget if the annual budget proposal is turned down by voters. The contingency budget can only grow by 4 percent per year or 1.2 times the growth in the CPI, which ever is smaller. This provision is unlikely to influence the spending choices considered here, because they are driven by voter preferences. If it does limit the spending growth stimulated by STAR, however, it may also freeze in place spending disparities across districts. Districts with low wealth or high costs that attempt to significantly increase spending to raise student performance may be prevented from doing so.

Our simulations of the long-run performance effects of STAR after accounting for all these factors are presented in the first panel of Table 9. STAR will raise performance in every class of district. In the average district, STAR will increase spending by about 14 percent and performance by about 12 percent. Performance does not increase as much as spending because STAR also will result in a small increase in district inefficiency. The average local tax rate will increase by one-third, from 1.93 percent to 2.57 percent. The second panel of Table 9 indicates that similar effects would be seen if STAR were implemented with a performance-based foundation aid program in place.

Because the homestead exemption in STAR is, in effect, a matching grant, which increases as the local tax rate increases, the behavioral responses that boost tax rates also boost the cost of STAR to the state. Our estimates of the long-run costs are presented in Table 10. The savings are larger than the first-round savings in all classes of district and are still heavily tilted toward high-wealth districts, particular downstate suburbs, and away from large cities, particularly New York City. As before, the disparities between large cities and suburbs are even larger after accounting for educational costs (Table 11); in cost adjusted dollars, New York City receives only $167 per pupil and the upstate large cities $447 per pupil, compared to average tax savings of $1,000 or more in all other classes of districts.

Table 10 also shows that the long-run impacts of tax-freeze aid will be small.[15] Although about one-third of the districts will receive some tax-freeze aid, the total amount of tax-freeze aid comes to $12 for each of the 2.8 million students in the state, compared to almost $1,200 per pupil from the homestead exemption. The second panel indicates that far fewer districts would receive tax-freeze aid if a performance-based foundation system were in place, largely because many of the

districts that receive tax-freeze aid under the current aid system would experience cuts in aid under this new system and would therefore be induced to increase their tax rates.

We estimate that the total annual cost of the homestead exemption is about $2.3 billion in 1991 dollars (or almost $2.7 billion in 1996 dollars, see Table 10), which is almost 25 percent higher than the first-round impact of STAR in Table 8. Since all of the previously published estimates of the cost of STAR have ignored the behavioral responses, we conclude that they have all underestimated the cost of STAR by this percentage. The state's official estimate of the annual cost of STAR when it is fully implemented in 2001 is $2.24 billion. Boosting this estimate by 25 percent to account for districts' behavioral responses to STAR brings it up to $2.8 billion. Inflating our 1991 estimate of $2.3 billion to 2001 dollars, assuming the same rate of inflation between 1996 and 2001 as between 1991 and 1996, results in a somewhat higher estimate of $3.1 billion. In either case, the cost to the state taxpayers is considerably above the official estimates.

A Proposal to Fix STAR

STAR provides property tax relief through a sizeable homestead exemption to homeowners. The problem with this proposal is not with the use of property tax exemptions, per se, which, as noted earlier, can be a helpful way to promote equity across taxpayers and to lower the burden of property taxes. However, in it present form, STAR undermines equity across taxpayers and magnifies rather than reduces performance inequities across school districts. In this section we present a plan for correcting some of the major flaws in STAR. However, as discussed below, any plan that employs homestead exemptions as a form of state school aid runs into some problems that are hard to solve. We believe that New York State could probably do a better job of both reducing its property tax burden and improving the equity of its educational finance system by expanding the state income tax credit for property taxes (for both owners and renters) and redirecting the money needed for STAR, approximately $3 billion, to a performance-based aid system, such as the one described in the previous section.

If New York State decides to keep the STAR program, we recommend a five-part reform to address STAR's most serious problems.

First the variation in the property tax exemption across counties, officially called the "sales price differential factor", should be eliminated. This is one of the main sources of inequity in STAR,

both across taxpayers and across school districts. There is absolutely no justification for giving a higher exemption to property owners in wealthier counties. Homeowners, in these counties, can recoup the higher sales price when they sell their home, and the state government should not subsidize their choice to live in these counties. Moreover, sales prices are not highly correlated with educational costs, so the sales price differential factor is a very poor method for recognizing educational cost differences across districts.

Second, tax relief for renters should be added for all districts, not just for New York City. Because property taxes are passes on to renters to some degree, it is profoundly unfair to restrict property tax relief to home owners. One promising mechanism for aiding renters is an expansion of the current homestead exemption for renters in the New York state income tax, a provision that is commonly called a "circuit breaker". In papers presented to the New York State Board of Regents, both Lankford and Wyckoff (1995) and Netzer and Berne (1995) recommended a significant increase in the generosity of the circuit breaker in New York.

While circuit breakers may help to reduce disparities in tax burdens between homeowners and renters, they do not eliminate the resource disparities across school districts created by STAR. The State will reimburse school districts for STAR exemptions but has no mechanism for reimbursing districts on the basis of the circuit breaker. Moreover, the STAR property tax exemptions will stimulate more local education spending, whereas an expended circuit breaker is unlikely to have any such effect.

Hence, the third part of our proposal is for New York State to provide direct aid to districts that have a high proportion of renters. There no equity justification whatsoever for a program that penalizes these districts, as STAR does. As a matter of simple fairness, we propose that, in each district, the State provide the same aid for each child in a renter household that it implicitly will provide through STAR for each child in an owner household. Under our proposal, each district would still select its spending level and tax rate, the State would still reimburse each district for the tax losses due to the homestead exemption, and then the State would provide each district with equivalent per pupil aid for the children of renters.[16]

Fourth, we propose that the State set a maximum property tax rate at which a district would be reimbursed for the lost revenue associated with the STAR exemptions. This tax rate cap should be higher in districts with higher educational costs or lower fiscal capacity. Our specific proposal

is to determine the tax rate that each district would have to levy to be able to provide the current median educational performance level, as measured by test scores and the graduation rate.[17] This rate is higher for districts with low wealth per pupil and for districts in high-wage labor markets or with characteristics, such as concentrated poverty, that raise the cost of achieving a given performance level. This proposal would lower total STAR reimbursements and minimize the price subsidy for most fiscally healthy districts; these districts already tend to provide above-average performance and to have tax rates above the minimum just defined. However, this proposal would preserve the full reimbursements and price subsidy for the districts that are, through no fault of their own, facing high costs or low capacity, and would therefore help to close the performance gap between these districts and the fiscally healthy ones. Because it limits the reimbursement for fiscally healthy districts, this part of our proposal would also save some money to be devoted to the new renter-based aid.

On average, the rate cap calculated in this way is almost the same as the actual local contribution rate (compare the sixth column in Table 9 to the last column in Table 13). The rate cap is below the actual rate in 1991 in the downstate suburbs and small cities, and well above the actual rate in New York City and the large upstate cities. Districts that set a tax rate above the rate cap would be required to fund the difference between their actual tax rate and the rate cap (multiplied by the total value of their exemptions) with local taxes. In essence, once a district exceeds its rate cap, its tax base is limited to its property value minus its total exemptions.[18]

Finally, we recommend repeal of tax freeze aid. It is a poorly designed provision because it does not recognize the difference between tax rate and tax base increases, and it involves far too little money to be effective. Moreover, it does not recognize variation in costs or capacity across districts and therefore could, if modified to be effective, magnify the dramatic performance differences that already exist in the state. The best thing to do with this provision is to eliminate it!

The top panel of Table 12 provides estimates of aid distribution under this revised STAR proposal. Because it caps the tax rate at which districts can be reimbursed, the homestead portion of this proposal would cost the state 25 percent less than the existing STAR plan. The lower cost of the homestead exemptions is more than offset by the higher aid provided districts with a significant number of renters. Because New York City would be a major beneficiary of renter aid, the cost of the renter portion of this proposal is almost as high as the homestead portion. With

existing homestead exemptions, this new revised STAR would greatly expand (by 30 percent) the financial aid provided by the state. To reduce the financial burden of this proposal, the state would have to cut the size of the homestead exemption. If the homestead exemptions were cut by one-quarter, for example (to a $22,500 basic exemption and a $40,000 exemption for low-income elderly), the financial impact on the state would be approximately the same as the present STAR plan (second panel of Table 12).

This revised STAR plan would greatly change the distribution of aid across districts compared to the existing STAR. The large cities—New York City, Yonkers and the upstate large cities—would receive per pupil aid twice the state average. The higher aid going to these districts is entirely consistent with their relatively high educational costs and low wealth per pupil. In addition, our revised STAR plan would preserve the city districts' strong incentives to maintain or even expand their spending because they are not close to hitting the tax rate cap for reimbursement. Other upstate districts, especially the rural and small city districts, would also be provided with significant STAR aid, because of their relatively low wealth. The districts receiving the least assistance would be the downstate suburbs and small cities. While these districts have a high share of owner-occupied housing, which would receive the exemption, their reimbursement would be capped at a low level because of the high fiscal capacity and fiscal health of these districts. The revised STAR program would preserve the equity objectives of the present operating aid system by distributing more aid to lower-wealth (correlation of -0.35), lower-income (-0.39), and lower-fiscal-health districts (-0.41).

As shown by a comparison of Tables 9 and 13, our revised STAR plan also would provide some improvement in the relative performance in high-cost or low-wealth districts relative to the current STAR program (or to the pre-STAR situation). To be specific, our revisions to STAR with a $30,000 basic exemption would boost the outcome index relative to present outcomes by 7.5 percent in New York City, 30 percent in the three large upstate cities, and by over 9 percent in Yonkers. These compare to increases of 4 percent, 17 percent and 8.5 percent, respectively, under the present STAR program. The performance increases are somewhat smaller if the homestead exemption is cut by one-quarter to preserve a budget neutral plan (relative to present STAR).

The redistribution of aid under our revised STAR also would reduce the desired spending level in most other districts, particularly those with low costs or high wealth. On average, the

changes in spending and performance in these districts are similar with the original STAR and our revised STAR plan with a $30,000 basic homestead exemption (again, compare Tables 9 and 13). When the homestead exemption is reduced so that our plan has the same the budgetary impact on the state as does STAR, our plan reduces spending and performance in these districts relative to STAR. Because of these two effects—higher performance increases in cities and other high-cost or low-wealth districts and lower performance increases elsewhere—our plan lessens performance disparities in the state instead of increasing them as the current STAR plan does.

The performance boost in large city districts is not as large as one might expect given the large price subsidies these districts receive under our plan. The reason for this result is that, as explained earlier, lowering the median voter's tax share not only lowers the price of education but also lowers the perceived value of existing state aid programs. Consequently, our revised STAR plan would increase spending and performance in city districts but would also encourage them to cut property taxes. Depending on the size of the homestead exemption, the reductions in per pupil property taxes would range from 20 to 30 percent in large city districts (compare columns 5 and 7 in Table 14). Smaller property tax reductions would occur in most other districts, as well, with the cuts exceeding those under the present STAR in most upstate districts. Overall, therefore, our revisions would magnify—and make more equitable—the property tax reductions induced by STAR.

This analysis indicates that homestead exemptions are not a particularly effective mechanism for improving performance in high-cost, low-wealth districts. Neither STAR nor our revised STAR leads to a dramatic increase in the performance of these districts, although our revised STAR, unlike the current STAR, does lower performance disparities in the state. Other state programs, including performance-based aid, are likely to have a larger impact on performance in the neediest districts. If policy makers want to shift the focus back toward meeting minimal performance standards in all districts, they should seriously consider eliminating STAR altogether and shifting to another approach. At the very least, however, they should consider revising the provisions of STAR that magnify performance inequities in the state.

In short, our proposed revisions to STAR would not only improve the equity of the homestead exemption across taxpayers, they would also shift state aid toward districts with the highest costs and/or lowest wealth and largely preserve the STAR-created incentive for these low-performing districts to boost their performance. Incentives to boost performance would be lowered,

however, in high-performing districts, so that the revisions, unlike the current STAR, would lower performance disparities across districts. These outcomes are consistent both with a desire to reduce the burden and improve the equity of the property tax and with The Board of Regents' goal to bring students in all districts up to a minimum performance standard for graduation from high school.

Conclusions

The School Tax Relief program, STAR, passed in 1997, provides a significant school tax reduction for homeowners through a new property tax exemption that is funded by the state. The value of the exemption is higher in higher-wealth counties. STAR also includes a smaller new aid program designed to discourage school districts from increasing their tax rate and a small income-tax relief program for New York City.

The STAR property tax breaks involve inequity across taxpayers both because they are higher in high-wealth counties and because they ignore renters. Moreover, the initial STAR reimbursements are skewed toward higher-wealth school districts with fewer renters, primarily downstate suburbs and small cities. Because of their relatively high rental shares and low property values, large cities will experience particularly low property tax savings. Even including its income-tax relief, New York City fares only slightly better than the other large cities in the state. The anti-equalizing nature of the first-round tax savings in STAR dramatically undermines the decades-long effort in New York state to provide more assistance to lower-wealth school districts.

STAR also will have some striking unintended consequences. Because the homestead exemption results in a large drop in local voters' share of any school property tax increase, STAR will increase the school performance level desired by voters. The result will be widespread increases in school tax rates, spending, and performance. The decline in voters' tax share also will decrease their incentive to monitor their school district and will therefore result in lower school district efficiency. As a result, STAR will induce larger increases in spending and taxes than in performance. Two provisions of STAR, tax-freeze aid and a contingency budget cap, are designed to discourage local tax increases. We find, however, that these provisions are not up to the task. The tax-freeze aid is far too small to have a significant impact on district decisions and the contingency budget cap is not a deterrent to spending increases desired by voters, such as the STAR-induced increases considered in this paper.

After accounting for these behavioral responses, we estimate that, in the average district, STAR will increase performance by 12 percent, spending by 14 percent, and the tax rate by one-third. Thus, the owners of commercial and industrial property, including rental housing, will experience large tax increases because of STAR. Some of these increases may be passed on to workers, consumers, and renters, thereby magnifying inequity across taxpayers. Moreover, the STAR-induced property tax increases will boost the cost of the program to the state by about 25 percent. Thus, we conclude that, when fully implemented, STAR will cost the state at least $2.7 billion per year, not the $2.2 billion in the official estimate.

Overall, STAR will modestly raise school performance in New York state, but in a profoundly inequitable manner. Indeed, STAR is the antithesis of equitable school finance reform, and it represents a lost opportunity of historic proportions. Instead of making a major contribution to improved performance in the neediest districts, the $3 billion annually spent on STAR will serve primarily to subsidize homeowners in wealthy school districts.

These problems could be solved with a major set of reforms to STAR. We recommend (1) eliminating the "sales price differential factor," which rewards taxpayers in high-wealth counties, (2) adding some tax relief for renters, (3) adding a program to give each school district as much aid per pupil in a rental household as the STAR reimbursements implicitly give per pupil in an owner household, (4) setting a maximum property tax rate at which STAR reimbursements will be given, a maximum that is higher for districts with high educational costs and/or low wealth, and (5) eliminating tax-freeze aid. These reforms would preserve the equity gains across taxpayers that are made possible by property tax exemptions and redirect STAR to be a program that promotes, not undermines, equity across school districts. However, any program based on property tax exemptions is likely to have a minimal impact on performance in the neediest school districts in the state; to the extent that the State wants to boost the performance in these districts, it should consider alternatives or supplements to STAR, not just revisions.

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Footnotes

1. Strictly speaking, this interpretation of the weights depends on the assumption that educational performance is provided at constant cost. See Duncombe and Yinger (1997). This assumption is employed in virtually all the educational finance literature, although it has not been adequately tested.

2. As indicated in the Appendix, Table A1, we actually estimate a cubic relationship, which allows the U-shape to flatten out at the highest enrollment levels.

3. Other measures of disability, such as the percentage of students with any form of disability, are available but we do not use them because they are influenced by school district policies regarding the identification of disabilities. See Lankford and Wyckoff (1996).

4. Both of these effects are mediated by the district's income. See Duncombe and Yinger (1997) for an explanation.

5. Our simulations are based on the 1991 state aid budget. We include the following programs, which had a total cost of $5.7 billion: Operating Aid, Attendance Improvement-Dropout Prevention Aid, High Tax Aid, Limited English Proficiency Aid, Compensatory Education Needs Aid, Compensatory Education Needs Aid—Small Cities, Small City Aid, Educationally Related Support Services Aid, and Supplemental Support Aid.

6. Some might prefer this alternative method for calculating the burden because, unlike the percentage increase in the property tax rate, it is not affected by the types of taxes a district uses—or shares with other governmental activities. It is not affected, for example, by the income tax in New York City.

7. Historically, New York has used a modified foundation formula, but the current formula mixes elements of a foundation formula and a power-equalizing formula. In effect, the current formula appears to act as a power-equalizing formula for districts with spending levels in the middle of the spending distribution. The state aid formulas are described in The State University of New York (1996).

8. The other two weighting factors bring in students not counted in average daily attendance, namely students in half-day kindergarten (with a weight of 0.5) and students in summer school (with a weight of 0.12.).

9. New York State also provides aid for transportation and for students with disabilities, both of which raise other cost issues. We have no measures of the underlying cost factors (transportation needs, rates of disability in the population, and so on), so we do not alter these programs and we do not include transportation costs in our measures of operating spending. Our approach is consistent with the assumption that these programs correct for cost differences across districts in transportation services and services for students with disabilities, but we have no way to test this assumption.

10. Several factors account for the increase in only 35 percent in outcomes even though revenue increases 2.5 times. First, state revenues only account for 37 percent of New York City's

education expenditure in 1991. A 2.5 times increase in state aid leads to only a 55 percent increase in total revenue. In addition, the local contribution rate (without a minimum tax rate) drops by 20 percent from 2.15 percent to 1.71 percent. Finally, the efficiency rate drops by 10 percent.

11. These calculations do not incorporate STAR's supplemental income tax relief of $464 million, or $449 per pupil, for New York City. This brings the total tax relief to New York City up to $955 per pupil, which is still below every other class of downstate district. This supplemental tax relief is unlikely to have much impact on school performance or tax rates.

12. The academic literature contains no method for determining what percentage of a property tax increase will be passed on to workers, consumers, or renters. It does, however, recognize that the least mobile workers, consumers, or renters, are most likely to bear some of the tax burden. See, for example, Carroll and Yinger (1994).

13. There is a major problem with the timing of the tax-freeze aid. The aid is based on a district's appropriation as of January 15th of each school year and the aid is paid no later than March 15th. Thus districts must make their plans for a school year on the basis of anticipated tax-freeze aid, not an announced aid amount. With a fixed budget, each district's tax-freeze aid depends on the decisions made by all other districts, so they will have to take a wild guess as to what their tax-freeze aid will be.

14. The legislation authorizing STAR also contains a provision that specifically prohibits a district from considering the exemption when determining its tax rate. This provision is completely unenforceable.

15. Note that the total tax-freeze aid is $20,806,000 in 1991 dollars, which is approximately equal to $25 million in 1996 dollars. Our calculations probably exaggerate the number of districts that receive tax-freeze aid because they are based on changes in tax rates between 1990 and 1991, a period in which the rate dropped in many districts. Many fewer districts would receive this aid in a period of rapidly increasing income or of some other factor that boosts the demand for services and hence boosts tax rates.

16. Since renter households with children are assumed not to have an elderly head of the household, only tax savings from the basic exemption ($30,000) are used in calculating the renter aid. This renter aid lowers the tax share in districts with many renters and therefore boosts their performance and inefficiency.

17. Specifically, we calculate how much a district would have to spend to achieve the median performance level given its costs, assuming that it is at the 75th percentile of the current efficiency distribution. Then we subtract aid from this required spending and divide by the district's tax base to determine the maximum tax rate at which the homestead exemption would be reimbursed.

18. This feature of our proposal implies that our revised STAR program will still alter the tax share voters face in many districts. As noted earlier, with STAR the tax share is median house value minus the basic exemption divided by house value per pupil. Under our revised STAR the denominator of this expression is house value per pupil minus total exemptions

per pupil. This new tax share is never as low as the current STAR tax share, and it could be either above or below the pre-star tax share. Our simulations of district behavior with our revised version of STAR account for this tax-share change.

Table 1
Average Characteristics of School Districts by Region and Type,
New York School Districts, 1991[a]

		Downstate				Upstate			
Characteristic	**State Average**	**New York City**	**Yonkers**	**Small Cities**	**Suburbs**	**Large Cities**	**Rural**	**Small Cities**	**Suburbs**
Per pupil expenditure									
Unadjusted:									
Total expenditures	$8,399	$7,501	$10,001	$12,135	$11,874	$8,245	$7,472	$7,312	$7,402
Operating expenditures	$6,058	$6,082	$6,781	$8,741	$9,016	$5,186	$5,145	$5,194	$5,333
Adjusted for cost:									
Total expenditures	**$8,399**	**$2,157**	**$5,314**	**$9,105**	**$10,706**	**$4,699**	**$7,637**	**$6,868**	**$8,146**
Operating expenditures	**$6,058**	**$1,749**	**$3,602**	**$6,559**	**$8,129**	**$2,956**	**$5,259**	**$4,878**	**$5,869**
Fiscal Capacity									
Per pupil property value	$196,483	$178,828	$256,889	$329,178	$394,556	$112,903	$138,974	$137,110	$146,751
Median family income	$40,438	$34,360	$43,305	$54,635	$61,635	$26,527	$30,474	$32,518	$39,029
Local school property tax rate[b]	2	1.5	1.9	1.8	1.9	2.2	2.0	2.1	2.1
Cost and other Factors									
Cost index	**100.0**	**347.8**	**188.2**	**133.3**	**110.9**	**175.5**	**97.8**	**106.5**	**90.9**
Teacher salaries	$24,699	$27,669	$27,153	$29,409	$28,704	$26,230	$23,476	$23,492	$23,628
Enrollment	3,878	931,211	18,244	4,592	3,277	33,054	1,060	4,134	2,273
Percent of children in poverty	11.6	29.6	19.9	10.9	5.2	36.5	16.0	19.3	9.2
Percent female-headed households	8.8	18.1	15.7	12.3	9.3	19.1	8.2	11.7	8.2
Percent students with severe handicaps	4.5	6.3	10.0	7.1	5.3	7.8	4.1	5.6	4.0
Percent students with limited English	1.0	9.8	5.8	4.3	2.2	2.1	0.6	1.0	0.6
Population density	1,167.1	38,138.4	10,612.3	7,053.9	3,061.7	6,268.3	64.8	1,825.8	532.9

[a]The same sample of 631 districts was used in these calculations as in the other tables.

[b]The local school tax rate equals total property tax revenue in a district divided by full property value of a district.

Table 2
Comparison of Local Contribution Rate and Efficiency Rate Required to Achieve an Outcome Standard
1991 Aid Distribution
Averages by Region for New York School Districts, 1991[a]

	Local Contribution Rate[b]			Percent Increase	Percent of Standard Achieved at		
Region of State	1991 Rate	Rate to Achieve Standard	Percent Increase	in Revenue as % of Median Income	1991 Est. Efficiency Rate	Full Efficiency	Percent Increase
Standard imposed- 25th percentile (6,843)[c]							
Downstate							
Small cities	1.95%	2.32%	19.21%	1.72%	91.85%	100.00%	8.87%
Suburbs	2.30%	2.55%	10.67%	0.81%	96.62%	99.31%	2.79%
New York City	2.15%	8.86%	312.06%	34.93%	32.64%	48.55%	48.73%
Yonkers	2.32%	4.55%	96.32%	13.23%	33.20%	43.93%	32.31%
Upstate							
Large cities	2.15%	5.30%	146.76%	13.59%	56.11%	75.01%	33.70%
Rural	1.64%	1.88%	14.44%	0.98%	94.74%	98.70%	4.17%
Small cities	1.87%	2.35%	25.94%	1.86%	91.02%	99.38%	9.19%
Suburbs	1.99%	2.06%	3.27%	0.27%	98.31%	99.93%	1.64%
Standard imposed- 50th percentile (8,444)[c]							
Downstate							
Small cities	1.95%	2.97%	52.52%	4.67%	81.28%	97.98%	20.56%
Suburbs	2.30%	2.79%	21.13%	1.82%	92.83%	98.77%	6.39%
New York City	2.15%	11.19%	420.47%	47.07%	26.45%	39.34%	48.73%
Yonkers	2.32%	5.33%	130.07%	17.87%	26.91%	35.60%	32.31%
Upstate							
Large cities	2.15%	7.02%	226.93%	20.81%	45.47%	60.79%	33.70%
Rural	1.64%	2.39%	45.75%	2.85%	86.65%	96.42%	11.28%
Small cities	1.87%	3.08%	65.08%	4.58%	81.24%	96.44%	18.71%
Suburbs	1.99%	2.36%	18.28%	1.25%	93.22%	99.44%	6.67%
Standard imposed- 75th percentile (10,125.3)[c]							
Downstate							
Small cities	1.95%	3.80%	94.80%	8.62%	70.73%	95.95%	35.66%
Suburbs	2.30%	3.16%	37.17%	3.43%	87.69%	98.06%	11.83%
New York City	2.15%	13.64%	534.29%	59.81%	22.06%	32.81%	48.73%
Yonkers	2.32%	6.15%	165.49%	22.74%	22.44%	29.69%	32.31%
Upstate							
Large cities	2.15%	8.83%	311.11%	28.39%	37.92%	50.70%	33.70%
Rural	1.64%	3.24%	97.07%	5.88%	76.21%	91.90%	20.59%
Small cities	1.87%	4.09%	119.22%	8.27%	70.22%	90.37%	28.70%
Suburbs	1.99%	2.99%	50.00%	3.27%	84.34%	97.81%	15.98%

[a]The number of districts used in these calculations is 631. Missing data existed for the other districts which were predominately small school districts.

[b]The local contribution rate is calculated by subtracting per pupil lump-sum aid from operating expenditures and dividing by per pupil property values.

[c]Percentiles refer to the 1991 distribution for outcomes based on a composite index of three outcomes: percent of students receiving a Regents Diploma, percent of students not dropping out, and average percent of students above the state set standard reference point for 3rd and 6th grade PEP tests.

Table 3
Comparison of Predicted Outcomes With Different Budget Levels and Aid Systems
Foundation Aid Formula with Minimum Aid Level Set at Zero
Averages by Region for New York School Districts, 1991

		Current Budget[a]		Double the Current Budget[a]	
Region of State	1991 Outcomes	No Minimum Tax Rate	Minimum Tax Rate Imposed	No Minimum Tax Rate	Minimum Tax Rate Imposed
Standard imposed- 25th percentile (6,843)[b]					
Downstate					
Small cities	7237	6842	7937	7015	7419
Suburbs	9817	9587	9824	9646	9699
New York City	2234	3024	5507	4241	4418
Yonkers	2272	2194	3875	2217	3597
Upstate					
Large cities	3839	3673	6400	4041	5439
Rural	7812	7123	8276	7407	7979
Small cities	7180	6502	7821	6784	7370
Suburbs	8862	8172	8824	8390	8632
Standard imposed- 50th percentile (8,444)[b]					
Downstate					
Small cities	7237	6842	8616	6946	8241
Suburbs	9817	9586	10111	9629	9998
New York City	2234	3048	6847	4415	5443
Yonkers	2272	2196	5552	2152	5344
Upstate					
Large cities	3839	3640	8116	4022	6859
Rural	7812	7111	9816	7298	9538
Small cities	7180	6495	9454	6656	9095
Suburbs	8862	8165	9975	8297	9802
Standard imposed- 75th percentile (10,125.3)[b]					
Downstate					
Small cities	7237	6842	9684	6877	9553
Suburbs	9817	9586	10556	9619	10450
New York City	2234	3061	8240	4518	6534
Yonkers	2272	2197	7311	2153	7041
Upstate					
Large cities	3839	3630	9884	3981	8413
Rural	7812	7104	11579	7227	11363
Small cities	7180	6494	11230	6579	10986
Suburbs	8862	8160	11552	8241	11445

[a]The aid budget includes eight forms of aid besides operating aid (see note 5 in the text). The state aid budget for the 631 districts in our sample was $5.7 billion in 1991.

[b]Percentiles refer to the 1991 distribution for outcomes based on a composite index of three outcomes: percent of students receiving a Regents Diploma, percent of students not dropping out, and average percent of students above the state set standard reference point for 3rd and 6th grade PEP tests.

Table 4
Comparison of Aid Per Pupil Under Different Budget Levels and Aid Systems
Foundation Aid Formula with Minimum Aid Level Set at Zero
Averages by Region for New York School Districts, 1991 (1991 dollars)

			New Aid System			
Region of State	1991 Aid System[b]	1997 Aid System[b] (1991 Dollars)	Current Budget[a]	Percent of Districts Receiving Aid	Double the Current Budget[a]	Percent of Districts Receiving Aid
Standard imposed- 25th percentile (6,843)[c]						
Downstate						
Small cities	$2,384	$1,617	$0	0.0%	$735	28.6%
Suburbs	$1,660	$1,116	$123	4.6%	$353	16.9%
New York City	$2,235	$1,912	$5,805	100.0%	$10,464	100.0%
Yonkers	$831	$586	$0	0.0%	$773	100.0%
Upstate						
Large cities	$2,736	$2,534	$1,645	100.0%	$4,586	100.0%
Rural	$2,846	$2,546	$136	16.6%	$1,145	77.3%
Small cities	$2,820	$2,440	$84	14.9%	$1,277	85.1%
Suburbs	$2,487	$2,066	$46	7.8%	$682	58.9%
Standard imposed- 50th percentile (8,444)[c]						
Downstate						
Small cities	$2,384	$1,617	$0	0.0%	$435	28.6%
Suburbs	$1,660	$1,116	$118	4.6%	$288	9.2%
New York City	$2,235	$1,912	$5,865	100.0%	$10,899	100.0%
Yonkers	$831	$586	$0	0.0%	$0	0.0%
Upstate						
Large cities	$2,736	$2,534	$1,327	66.7%	$4,388	100.0%
Rural	$2,846	$2,546	$99	11.4%	$721	56.9%
Small cities	$2,820	$2,440	$51	4.3%	$743	55.3%
Suburbs	$2,487	$2,066	$32	4.3%	$381	35.5%
Standard imposed- 75th percentile (10,125.3)[c]						
Downstate						
Small cities	$2,384	$1,617	$0	0.0%	$136	14.3%
Suburbs	$1,660	$1,116	$114	3.8%	$254	6.9%
New York City	$2,235	$1,912	$5,900	100.0%	$11,140	100.0%
Yonkers	$831	$586	$0	0.0%	$0	0.0%
Upstate						
Large cities	$2,736	$2,534	$1,185	33.3%	$4,044	100.0%
Rural	$2,846	$2,546	$78	7.6%	$470	38.9%
Small cities	$2,820	$2,440	$45	4.3%	$431	34.0%
Suburbs	$2,487	$2,066	$24	3.5%	$217	20.8%

[a]Based on the composite outcome variable constructed from coefficients in the cost model.

[a]The aid budget includes eight forms of aid besides operating aid (see note 5 in the text). The state aid budget for the 631 districts in our sample was was $5.7 billion in 1991 dollars.

[c]Percentiles refer to the 1991 distribution for outcomes based on a composite index of three outcomes: percent of students receiving a Regents Diploma, percent of students not dropping out, and average percent of students above the state set standard reference point for 3rd and 6th grade PEP tests.

Table 5

Comparison of Local Contribution Rates to Operating Expenditures Under Different Budget Levels and Aid Systems[a]
Foundation Aid Formula with Minimum Aid Level Set at Zero
Averages by Region for New York School Districts, 1991

		Current Budget[b]		Double the Current Budget[b]	
Region of State	1991 Rates	No Minimum Tax Rate	Minimum Tax Rate Imposed	No Minimum Tax Rate	Minimum Tax Rate Imposed
Standard imposed- 25th percentile (6,843)[c]					
Downstate					
Small cities	1.95%	2.17%	2.86%	2.04%	2.36%
Suburbs	2.30%	2.43%	2.65%	2.41%	2.45%
New York City	2.15%	1.71%	5.66%	2.70%	3.05%
Yonkers	2.32%	2.56%	3.36%	2.35%	3.05%
Upstate					
Large cities	2.15%	2.79%	5.66%	1.33%	3.05%
Rural	1.64%	3.36%	4.08%	2.60%	2.95%
Small cities	1.87%	3.31%	4.16%	2.61%	3.00%
Suburbs	1.99%	3.28%	3.68%	2.84%	2.99%
Standard imposed- 50th percentile (8,444)[c]					
Downstate					
Small cities	1.95%	2.17%	3.24%	2.08%	2.95%
Suburbs	2.30%	2.44%	2.86%	2.43%	2.70%
New York City	2.15%	1.69%	7.71%	2.85%	4.89%
Yonkers	2.32%	2.56%	4.14%	2.58%	4.14%
Upstate					
Large cities	2.15%	2.97%	7.61%	1.45%	4.89%
Rural	1.64%	3.39%	5.05%	2.89%	4.24%
Small cities	1.87%	3.33%	5.16%	2.90%	4.42%
Suburbs	1.99%	3.29%	4.33%	3.03%	3.88%
Standard imposed- 75th percentile (10,125.3)[c]					
Downstate					
Small cities	1.95%	2.17%	3.78%	2.13%	3.69%
Suburbs	2.30%	2.44%	3.14%	2.45%	3.00%
New York City	2.15%	1.69%	9.88%	2.93%	6.95%
Yonkers	2.32%	2.56%	4.96%	2.58%	4.96%
Upstate					
Large cities	2.15%	3.05%	9.50%	1.64%	6.95%
Rural	1.64%	3.42%	6.09%	3.09%	5.54%
Small cities	1.87%	3.34%	6.21%	3.08%	5.77%
Suburbs	1.99%	3.30%	5.15%	3.15%	4.88%

[a]The local contribution rate is calculated by subtracting per pupil lump-sum aid from operating expenditures and dividing by per pupil property values.

[b]The aid budget includes eight forms of aid besides operating aid (see note 5 in the text). The state aid budget for the 631 districts in our sample was $5.7 billion in 1991.

[c]Percentiles refer to the 1991 distribution for outcomes based on a composite index of three outcomes: percent of students receiving a Regents Diploma, percent of students not dropping out, and average percent of students above the state set standard reference point for 3rd and 6th grade PEP tests.

Table 5

Comparison of Local Contribution Rates to Operating Expenditures Under Different Budget Levels and Aid Systems[a]
Foundation Aid Formula with Minimum Aid Level Set at Zero
Averages by Region for New York School Districts, 1991

		Current Budget[b]		Double the Current Budget[b]	
Region of State	1991 Rates	No Minimum Tax Rate	Minimum Tax Rate Imposed	No Minimum Tax Rate	Minimum Tax Rate Imposed
Standard imposed- 25th percentile (6,843)[c]					
Downstate					
Small cities	1.95%	2.17%	2.86%	2.04%	2.36%
Suburbs	2.30%	2.43%	2.65%	2.41%	2.45%
New York City	2.15%	1.71%	5.66%	2.70%	3.05%
Yonkers	2.32%	2.56%	3.36%	2.35%	3.05%
Upstate					
Large cities	2.15%	2.79%	5.66%	1.33%	3.05%
Rural	1.64%	3.36%	4.08%	2.60%	2.95%
Small cities	1.87%	3.31%	4.16%	2.61%	3.00%
Suburbs	1.99%	3.28%	3.68%	2.84%	2.99%
Standard imposed- 50th percentile (8,444)[c]					
Downstate					
Small cities	1.95%	2.17%	3.24%	2.08%	2.95%
Suburbs	2.30%	2.44%	2.86%	2.43%	2.70%
New York City	2.15%	1.69%	7.71%	2.85%	4.89%
Yonkers	2.32%	2.56%	4.14%	2.58%	4.14%
Upstate					
Large cities	2.15%	2.97%	7.61%	1.45%	4.89%
Rural	1.64%	3.39%	5.05%	2.89%	4.24%
Small cities	1.87%	3.33%	5.16%	2.90%	4.42%
Suburbs	1.99%	3.29%	4.33%	3.03%	3.88%
Standard imposed- 75th percentile (10,125.3)[c]					
Downstate					
Small cities	1.95%	2.17%	3.78%	2.13%	3.69%
Suburbs	2.30%	2.44%	3.14%	2.45%	3.00%
New York City	2.15%	1.69%	9.88%	2.93%	6.95%
Yonkers	2.32%	2.56%	4.96%	2.58%	4.96%
Upstate					
Large cities	2.15%	3.05%	9.50%	1.64%	6.95%
Rural	1.64%	3.42%	6.09%	3.09%	5.54%
Small cities	1.87%	3.34%	6.21%	3.08%	5.77%
Suburbs	1.99%	3.30%	5.15%	3.15%	4.88%

[a]The local contribution rate is calculated by subtracting per pupil lump-sum aid from operating expenditures and dividing by per pupil property values.

[b]The aid budget includes eight forms of aid besides operating aid (see note 5 in the text). The state aid budget for the 631 districts in our sample was $5.7 billion in 1991.

[c]Percentiles refer to the 1991 distribution for outcomes based on a composite index of three outcomes: percent of students receiving a Regents Diploma, percent of students not dropping out, and average percent of students above the state set standard reference point for 3rd and 6th grade PEP tests.

Table 6

Comparison of Local Share of Operating Expenditures Under Different Budget Levels and Aid Systems[a]
Foundation Aid Formula with Minimum Aid Level Set at Zero
Averages by Region for New York School Districts, 1991

		Current Budget[b]		Double the Current Budget[b]	
Region of State	1991 Rates	No Minimum Tax Rate	Minimum Tax Rate Imposed	No Minimum Tax Rate	Minimum Tax Rate Imposed
Standard imposed- 25th percentile (6,843)[c]					
Downstate					
Small cities	70.10%	100.00%	100.00%	86.53%	89.71%
Suburbs	79.66%	97.66%	98.56%	94.82%	95.11%
New York City	63.25%	34.50%	63.55%	31.61%	34.30%
Yonkers	87.75%	100.00%	100.00%	88.67%	91.03%
Upstate					
Large cities	46.76%	67.22%	80.16%	25.73%	43.26%
Rural	40.84%	96.18%	97.17%	72.04%	74.96%
Small cities	44.58%	97.68%	98.35%	71.80%	74.84%
Suburbs	51.09%	98.60%	99.02%	83.31%	84.47%
Standard imposed- 50th percentile (8,444)[c]					
Downstate					
Small cities	70.10%	100.00%	100.00%	90.89%	95.18%
Suburbs	79.66%	97.84%	98.89%	96.18%	97.04%
New York City	63.25%	34.07%	70.15%	31.84%	44.54%
Yonkers	87.75%	100.00%	100.00%	100.00%	100.00%
Upstate					
Large cities	46.76%	73.90%	87.14%	29.10%	56.19%
Rural	40.84%	97.31%	98.35%	81.98%	87.24%
Small cities	44.58%	98.47%	99.13%	83.23%	88.42%
Suburbs	51.09%	99.03%	99.46%	90.28%	92.94%
Standard imposed- 75th percentile (10,125.3)[c]					
Downstate					
Small cities	70.10%	100.00%	100.00%	97.09%	98.82%
Suburbs	79.66%	98.04%	99.12%	96.97%	97.96%
New York City	63.25%	33.86%	74.96%	31.97%	52.73%
Yonkers	87.75%	100.00%	100.00%	100.00%	100.00%
Upstate					
Large cities	46.76%	76.94%	90.35%	34.72%	66.51%
Rural	40.84%	98.00%	98.93%	88.26%	93.19%
Small cities	44.58%	98.64%	99.36%	90.00%	94.48%
Suburbs	51.09%	99.26%	99.67%	94.40%	96.72%

[a]The local share is calculated by subtracting most lump-sum aid from operating expenditures and dividing by operating expenditures. Represents

[b]The aid budget includes eight forms of aid besides operating aid (see note 5 in the text). The state aid budget for the 631 districts in our sample was $5.7 billion in 1991.

[c]Percentiles refer to the 1991 distribution for outcomes based on a composite index of three outcomes: percent of students receiving a Regents Diploma, percent of students not dropping out, and average percent of students above the state set standard reference point for 3rd and 6th grade PEP tests.

Table 7
Comparison of Predicted Relative Efficiency Rates Under Different Budgets and Foundation Aid Systems (Minimum Aid is Zero)[a]
Averages by Region for New York School Districts, 1991

Region of State	1991 Aid System	New Aid System: Current Budget[b]	New Aid System: Double the Current Budget[b]
Standard imposed- 25th percentile (6,843)[c]			
Downstate			
Small cities	47.6%	59.1%	53.9%
Suburbs	50.3%	55.7%	54.4%
New York City	67.2%	61.6%	49.4%
Yonkers	75.6%	78.3%	72.7%
Upstate			
Large cities	74.3%	76.6%	65.1%
Rural	72.6%	81.7%	78.0%
Small cities	69.6%	80.1%	74.9%
Suburbs	68.9%	78.0%	75.3%
Standard imposed- 50th percentile (8,444)[c]			
Downstate			
Small cities	47.6%	59.1%	55.9%
Suburbs	50.3%	55.8%	54.8%
New York City	67.2%	61.8%	49.2%
Yonkers	75.6%	78.5%	75.5%
Upstate			
Large cities	74.3%	77.5%	65.5%
Rural	72.6%	81.8%	79.4%
Small cities	69.6%	80.3%	77.1%
Suburbs	68.9%	78.0%	76.6%
Standard imposed- 75th percentile (10,125.3)[c]			
Downstate			
Small cities	47.6%	59.1%	58.1%
Suburbs	50.3%	55.8%	55.0%
New York City	67.2%	61.9%	49.1%
Yonkers	75.6%	78.5%	75.6%
Upstate			
Large cities	74.3%	77.9%	66.3%
Rural	72.6%	81.8%	80.3%
Small cities	69.6%	80.3%	78.5%
Suburbs	68.9%	78.0%	77.3%

[a]This table presents estimates of relative efficiency rates. All cost factors and additional outcomes are held constant at the mean and the aid and other efficiency factors are allowed to vary.

[b]The aid budget includes eight forms of aid besides operating aid (see note 5 in the text). The state aid budget for the 631 disricts in our sample was $5.7 billion in 1991.

[c]Percentiles refer to the 1991 distribution for outcomes based on a composite index of three outcomes: percent of students receiving a Regents Diploma, percent of students not dropping out, and average percent of students above the state set standard reference point for 3rd and 6th grade PEP tests.

Comparison of First Round Tax Savings from STAR Program with Fiscal Capacity and Cost Measures[a]
Averages by Region for New York School Districts (1991 Dollars)

Region	Per Pupil Property Tax Savings From Star	Cost-Adjusted[b] Per Pupil Property Tax Savings From Star	Percent of State Average: Tax Savings From Star	Per Pupil Operating Aid (1991)	Property Values (1994)	Median Family Income (1990)	Comprehensive Cost Index	Fiscal Health Index
Downstate								
Small cities	$1,436	$1,078	165	50	168	135	133	134
Suburbs	$1,306	$1,178	150	61	202	152	111	190
New York City[c]	$506	$146	58	88	91	85	348	26
Yonkers	$1,704	$905	195	30	131	107	188	70
Upstate								
Large cities	$521	$297	60	108	58	66	175	33
Rural	$692	$708	79	121	70	75	98	71
Small cities	$804	$755	92	103	70	80	106	68
Suburbs	$794	$873	91	104	75	96	91	83
Total Star Aid (000s of $s)	$1,869,586,455		**Correlations with Star Tax Savings**	-0.52	0.24	0.62	0.13	0.23

[a]Estimate of the tax savings from STAR is based on the exemptions for each county multiplied by an estimate of total owner occupied housing units in 1990. This estimate ignores the response of districts to the changing incentives in this proposal. The calculation is based on 631 districts; the tax savings for the other districts is estimated to be under $.2 million.

[b]Tax savings are divided by the cost index expressed as percent.

[c]The STAR plan also included supplemental income tax relief of $464 million or $449 per pupil for New York City. This has not been added to the estimated property tax savings.

Table 9

Comparison of the Effects of the STAR Program with Full Adjustment by School Districts[a]
Averages by Region for New York School Districts in 1991

	Outcome Index[b]		Operating Expenditures per Pupil		Local Contribution Rate	
Region	**Without Star**	**With Star**	**Without Star**	**With Star**	**Without Star**	**With Star**
Actual Aid System in 1991[c]						
State Average	8,519	9,575	$6,027	$6,865	1.93%	2.57%
Downstate						
Small cities	7,237	7,620	$8,741	$9,343	1.95%	2.12%
Suburbs	9,817	10,344	$9,016	$9,817	2.30%	2.56%
New York City	2,234	2,325	$6,082	$6,396	2.15%	2.33%
Yonkers	2,272	2,466	$6,781	$7,144	2.32%	2.46%
Upstate						
Large cities	3,839	4,490	$5,186	$5,889	2.15%	2.82%
Rural	7,812	9,462	$5,049	$6,138	1.64%	2.66%
Small cities	7,180	8,151	$5,194	$5,908	1.87%	2.51%
Suburbs	8,862	9,723	$5,333	$6,002	1.99%	2.52%
Foundation Aid System (Standard imposed- 50th percentile)[c]						
State Average	7,927	9,194	$5,012	$6,089	3.14%	4.02%
Downstate						
Small cities	6,842	7,370	$6,872	$7,263	2.17%	2.52%
Suburbs	9,586	10,209	$7,918	$8,776	2.44%	2.70%
New York City	3,048	2,968	$8,896	$8,186	1.69%	1.30%
Yonkers	2,196	2,405	$6,584	$7,767	2.56%	3.02%
Upstate						
Large cities	3,640	4,340	$4,809	$5,805	2.97%	3.92%
Rural	7,111	9,045	$4,097	$5,489	3.39%	4.78%
Small cities	6,495	7,675	$4,052	$5,118	3.33%	4.29%
Suburbs	8,165	9,244	$4,330	$5,273	3.29%	4.07%

[a]Estimate of the effects of STAR is based on an estimate of the response of school districts to both the homestead exemptions provided in the program, and the tax freeze aid which is limited to $25 million. The homestead exemptions are adjusted to 1991 property values. The calculations are based on 631 districts; the tax savings for the other districts is estimated to be under $.2 million.

[b]Percentiles refer to the 1991 distribution for outcomes based on a composite index of three outcomes: percent of students receiving a Regents Diploma, percent of students not dropping out, and average percent of students above the state set standard reference point for 3rd and 6th grade PEP tests.

[c] School aid used in the analysis includes most forms of lump-sum aid going to school districts. The state aid budget was $5.7 billion in 1991.

Table 10
Comparison of the State Aid Per Pupil With and Without the STAR Program
With Full Adjustment by School Districts[a]
Averages by Region for New York School Districts in 1991

Region	Operating Aid Without Star	STAR Aid Programs: Homestead Exemption	STAR Aid Programs: Tax Freeze Aid Program	STAR Aid Programs: All STAR	Total for Operating Aid and STAR Aid
Actual Aid System in 1991[c]					
State Total (000s of 1991$)[d]	$5,738,210	$2,298,771	$23,183	$2,321,954	$8,060,164
State Total (000s of 1996$)[d]	$6,610,317	$2,648,144	$26,706	$2,674,850	$9,285,167
Downstate					
Small cities	$2,384	$1,618	$31.68	$1,650	$4,034
Suburbs	$1,660	$1,541	$14.35	$1,555	$3,215
New York City[e]	$2,235	$580	$0.00	$580	$2,815
Yonkers	$831	$1,876	$0.00	$1,876	$2,707
Upstate					
Large cities	$2,736	$785	$32.14	$817	$3,553
Rural	$2,846	$1,047	$11.01	$1,058	$3,904
Small cities	$2,820	$1,069	$20.24	$1,089	$3,909
Suburbs	$2,487	$1,030	$10.25	$1,040	$3,527
Foundation Aid System (Standard imposed- 50th percentile)[c]					
State Total (000s of 1991$)[d]	$5,742,932	$2,255,226	$21,809	$2,277,035	$8,019,967
State Total (000s of 1996$)[d]	$6,615,756	$2,597,981	$25,124	$2,623,104	$9,238,860
Downstate					
Small cities	$0	$1,965	$0.65	$1,965	$1,965
Suburbs	$118	$1,651	$12.80	$1,664	$1,782
New York City[e]	$5,865	$149	$2.99	$152	$6,017
Yonkers	$0	$2,564	$0.00	$2,564	$2,564
Upstate					
Large cities	$1,327	$1,214	$0.00	$1,214	$2,541
Rural	$99	$1,926	$0.04	$1,927	$2,026
Small cities	$51	$1,892	$2.86	$1,895	$1,946
Suburbs	$32	$1,734	$0.07	$1,734	$1,766

[a]Estimate of the effects of STAR is based on an estimate of the response of school districts to both the homestead exemptions provided in the program, and the tax freeze aid which is limited to $25 million. The homestead exemptions are adjusted to 1991 property values.

[b]Percentiles refer to the 1991 distribution for outcomes based on a composite index of three outcomes: percent of students receiving a Regents Diploma, percent of students not dropping out, and average percent of students above the state set standard reference point for 3rd and 6th grade PEP tests.

[c]The aid budget includes eight forms of aid besides operating aid (see note 5 in the text). The state aid budget for the 631 districts in our sample was $5.7 billion in 1991 dollars.

[e]The estimates of total monetary costs underestimate because approximately 60 districts are not in the calculations. Our rough estimates of the costs for these districts are relatively small, under $200 million, so they were not included in the total.

[e]The STAR plan also included supplemental income tax relief of $464 million or $449 per pupil for New York City. This has not been added to the estimated property tax savings.

Table 11
Comparison of the Cost-adjusted State Aid Per Pupil With and Without the STAR Program
With Full Adjustment by School Districts[a]
Averages by Region for New York School Districts in 1991

Region	Operating Aid Without Star	STAR Aid Programs: Homestead Exemption	STAR Aid Programs: Tax Freeze Aid Program	STAR Aid Programs: All STAR	Total for Operating Aid and STAR Aid
Actual Aid System in 1991[c]					
Downstate					
Small cities	$1,789	$1,214	$24	$1,238	$3,027
Suburbs	$1,497	$1,389	$13	$1,402	$2,899
New York City[d]	$643	$167	$0	$167	$809
Yonkers	$441	$997	$0	$997	$1,438
Upstate					
Large cities	$1,559	$447	$18	$466	$2,025
Rural	$2,909	$1,070	$11	$1,081	$3,990
Small cities	$2,649	$1,004	$19	$1,023	$3,672
Suburbs	$2,737	$1,134	$11	$1,145	$3,882
Foundation Aid System (Standard imposed- 50th percentile)[c]					
Downstate					
Small cities	$0	$1,474	$0.48	$1,475	$1,475
Suburbs	$89	$1,239	$9.61	$1,249	$1,337
New York City[d]	$4,401	$112	$2.25	$114	$4,515
Yonkers	$0	$1,924	$0.00	$1,924	$1,924
Upstate					
Large cities	$996	$911	$0.00	$911	$1,907
Rural	$74	$1,446	$0.03	$1,446	$1,520
Small cities	$39	$1,420	$2.14	$1,422	$1,461
Suburbs	$24	$1,301	$0.05	$1,301	$1,325

[a]Estimate of the effects of STAR is based on an estimate of the response of school districts to both the homestead exemptions provided in the program, and the tax freeze aid which is limited to $25 million. The homestead exemptions are adjusted to 1991 property values. Tax savings are divided by the cost index expressed as percent.

[b]Percentiles refer to the 1991 distribution for outcomes based on a composite index of three outcomes: percent of students receiving a Regents Diploma, percent of students not dropping out, and average percent of students above the state set standard reference point for 3rd and 6th grade PEP tests.

[c]The aid budget includes eight forms of aid besides operating aid (see note 5 in the text). The state aid budget for the 631 districts in our sample was $5.7 billion in 1991 dollars.

[d]The STAR plan also included supplemental income tax relief of $464 million or $449 per pupil for New York City. This has not been added to the estimated property tax savings.

Table 12
Comparison of the State Aid Per Pupil With and Without the Revised STAR Program
With Full Adjustment by School Districts[a]
REVISED STAR PROGRAM
Averages by Region for New York School Districts in 1991

Region	Operating Aid Without Star	Revised STAR Aid Programs: Homestead Exemption[b]	Revised STAR Aid Programs: Equivalent Renter Aid[c]	Revised STAR Aid Programs: Total Revised STAR	Total for Operating Aid and STAR Aid
Actual Aid System in 1991[d]-- Same Exemptions in Present Star					
State Total (000s of 1991$)[e]	$5,738,210	$1,707,025	$1,314,401	$3,021,426	$8,759,636
State Total (000s of 1996$)[e]	$6,610,317	$1,966,463	$1,514,166	$3,480,629	$10,090,946
Downstate					
Small cities	$2,384	$704	83	$787	$3,171
Suburbs	$1,660	$698	30	$727	$2,387
New York City[f]	$2,235	$473	1,163	$1,635	$3,871
Yonkers	$831	$995	1,284	$2,279	$3,110
Upstate					
Large cities	$2,736	$905	1,144	$2,048	$4,785
Rural	$2,846	$783	159	$941	$3,788
Small cities	$2,820	$991	95	$1,086	$3,907
Suburbs	$2,487	$845	33	$878	$3,365
Actual Aid System in 1991[d]-- Two-thirds the Exemptions in Present Star					
State Total (000s of 1991$)[e]	$5,742,932	$1,294,654	1,003,493	$2,298,147	$8,041,079
State Total (000s of 1996$)[e]	$6,615,756	$1,491,419	1,156,006	$2,647,425	$9,263,181
Downstate					
Small cities	$2,384	$535	62	$598	$2,982
Suburbs	$1,660	$528	22	$550	$2,210
New York City[f]	$2,235	$372	898	$1,270	$3,505
Yonkers	$831	$787	999	$1,787	$2,618
Upstate					
Large cities	$2,736	$660	814	$1,474	$4,210
Rural	$2,846	$580	115	$695	$3,541
Small cities	$2,820	$728	69	$797	$3,617
Suburbs	$2,487	$640	25	$665	$3,152

[a]Revised STAR involves a cap on tax rates that adjusts to fiscal health differences across districts and similar aid to districts for children of renters. Estimate of the effects of STAR is based on an estimate of the response of school districts to both the homestead exemptions provided in the program, and the the renter aid program that we are proposing. The tax freeze aid program is assumed to be eliminated. The homestead exemptions are adjusted to 1991 property values.

[b]Homestead exemption is kept at $30,000 for basic exemption and $50,000 for low income elderly for all counties (no sales price differential factor). To keep the state budgetary committment similar to present STAR program, we cut the exemptions by one-quarter.

[c]The district receives approximately the same per pupil STAR aid for renters as homeowners. Differences exist because only the basic exemption is used to calculate the renter STAR aid.

[d]The aid budget includes eight forms of aid besides operating aid (see note 5 in the text). The state aid budget for the 631 districts in our sample was $5.7 billion in 1991.

[e]The estimates of total monetary costs underestimate because approximately 60 districts are not in the calculations. Our rough estimates of the costs for these districts are small, under $100 million, so they were not included in the total.

[f]The STAR plan also included supplemental income tax relief of $464 million or $449 per pupil for New York City. This has not been added to the estimated property tax savings.

Table 13
Comparison of the Effects of the STAR Program with Full Adjustment by School Districts
REVISED STAR PROGRAM[a]
Averages by Region for New York School Districts in 1991

Region	Outcome Index[b]		Operating Expenditures per Pupil		Maximum Reimbursement Rate Under Revised STAR
	Homestead Exemption[c]	75 Percent of STAR Homestead Exemption[c]	Homestead Exemption[c]	75 Percent of STAR Homestead Exemption[c]	
Actual Aid System in 1991[d]					
State Average	8,990	8,833	$6,599	$6,425	1.95%
Downstate					
Small cities	7,373	7,337	$9,045	$8,969	1.74%
Suburbs	9,848	9,842	$9,652	$9,470	1.55%
New York City[e]	2,402	2,355	$6,697	$6,532	9.36%
Yonkers	2,486	2,431	$7,165	$7,068	3.67%
Upstate					
Large cities	5,002	4,604	$6,453	$6,013	6.19%
Rural	8,745	8,391	$5,781	$5,514	2.96%
Small cities	7,748	7,547	$5,726	$5,564	2.45%
Suburbs	9,141	9,087	$5,730	$5,644	1.86%

[a]Revised STAR involves a cap on tax rates that adjusts to fiscal health differences across districts and similar aid to districts for children of renters. Estimate of the effects of STAR are based on estimates of the response of school districts to both the homestead exemptions provided in the program, and the renter aid program that we are proposing. The tax freeze aid program is assumed to be eliminated. The homestead exemptions are adjusted to 1991 property values.

[b]The index is based on a composite index of three outcomes in 1991: percent of students receiving a Regents Diploma, percent of students not dropping out, and average percent of students above the state set standard reference point for 3rd and 6th grade PEP tests.

[c]Homestead exemption kept at $30,000 for basic exemption and $50,000 for low income elderly for all counties (no sales price differential factor) to keep budget similar to present STAR program, we cut the exemptions by one-quarter.

[d]The aid budget includes eight forms of aid besides operating aid (see note 5 in the text). The state aid budget for the 631 districts in our sample was $5.7 billion in 1991.

[e]The STAR plan also included supplemental income tax relief of $464 million or $449 per pupil for New York City. This has not been added to the estimated property tax savings.

Table 14
Comparison of Per Pupil Property Tax Revenue
With the Existing STAR Program, the Revised STAR Program and Without STAR[a]
Averages by Region for New York School Districts in 1991

Region	Without STAR	With Existing STAR Program	Percent Change from Property Taxes Without STAR	With Revised STAR Present Homestead Exemption[b]	Percent Change from Property Taxes Without STAR	With Revised STAR 75 Percent of STAR Homestead Exemption[b]	Percent Change from Property Taxes Without STAR
Actual Aid System in 1991[c]							
State Average	$3,568	$3,244	-9.08%	$3,207	-10.13%	$3,325	-6.82%
Downstate							
Small cities	$6,357	$5,309	-16.49%	$5,874	-7.60%	$5,987	-5.81%
Suburbs	$7,356	$6,602	-10.25%	$7,765	5.55%	$7,260	-1.30%
New York City[d]	$3,846	$3,581	-6.91%	$2,827	-26.51%	$3,026	-21.32%
Yonkers	$5,950	$4,437	-25.42%	$4,055	-31.84%	$4,451	-25.19%
Upstate							
Large cities	$2,450	$2,336	-4.64%	$1,669	-31.88%	$1,803	-26.41%
Rural	$2,203	$2,233	1.37%	$1,993	-9.51%	$1,973	-10.45%
Small cities	$2,373	$1,999	-15.77%	$1,820	-23.33%	$1,947	-17.98%
Suburbs	$2,846	$2,474	-13.05%	$2,365	-16.89%	$2,492	-12.41%

[a]To allow comparisons across districts, the estimates of property tax revenues are based on the assumption that all non-aid revenue is raised by the property taxes. Revised STAR involves a cap on tax rates that adjusts to fiscal health differences across districts and similar aid to districts for children of renters. Estimate of the effects of STAR are based on estimates of the response of school districts to both the homestead exemptions provided in the program, and the renter aid program that we are proposing. The tax freeze aid program is assumed to be eliminated. The homestead exemptions are adjusted to 1991 property values.

[b]Homestead exemption kept at $30,000 for basic exemption and $50,000 for low income elderly for all counties (no sales price differential factor) to keep budget similar to present STAR program, we cut the exemptions by one-quarter.

[c]The budget for non-STAR aid includes eight forms of aid besides operating aid (see note 5 in the text), and was $5.7 billion in 1991 for the 631 districts in our sample.

[d]The STAR plan also included supplemental income tax relief of $464 million or $449 per pupil for New York City. This has not been added to the estimated property tax savings.

Table A-1
Education Cost and Demand Equations,
New York School Districts, 1991[a]

Variables	Coefficient	t-statistic
Cost Equation[a]		
Intercept	-3.6192	-1.40
Third- and Sixth-Grade PEP Scores (Average % above Standard Reference Point)[b]	5.2713	2.78
Percent non-dropouts[b]	2.8065	0.98
Percent receiving Regents diploma[b]	1.0255	2.43
Efficiency index (percent)[b]	-1.1107	-4.55
Log of teacher salaries[b]	0.8481	2.10
Log of enrollment	-1.2407	-2.84
Square of log of enrollment	0.1201	2.43
Cubic of log of enrollment	-0.0036	-1.92
Percent of children in poverty	0.9083	3.70
Percent female-headed households	1.9597	3.56
Percent of students with severe handicap	0.5089	0.79
Percent of students with limited English proficiency	4.0290	2.80
SSE	30.37	
Adj. R-square	0.40	
Number of Observations	631	
Demand Equation[a]		
Intercept	-0.9226	-1.08
Log of median family income	0.8993	10.21
Ratio of operating aid to median income	3.2059	3.56
Ratio of matching aid to median income	-4.0475	-0.87
Log of tax share	-0.3379	-7.77
Log of efficiency index[b]	0.5361	3.31
Percent owner-occupied housing	0.1784	1.24
Relative percent of adults with college education	0.0009	0.00
SSE	31.31	
Adj. R-square	0.45	
Number of Observations	631	

[a] The cost and demand models are estimated with linear 2SLS regression. The dependent variables are the logarithms of per pupil operating expenditures for the cost model and of the outcome index for the demand model.

[b] These variables are treated as endogenous. See Duncombe and Yinger (1997) for discussion of the instruments used in this procedurre.

Table A-2
Determinants of School District Efficiency,
New York School Districts, 1991[a]

Variables	Coefficient	t-statistic
Intercept	5.271468	4.241
Aid Variables[b]		
Within-class variation	-1615.109	-2.506
Between-class variation	-540.1668	-1.702
Within * log of income	310.841	2.536
Within * log of income squared	-14.98446	-2.572
Between * log of income	103.4956	1.693
Between * log of income squared	-4.980412	-1.692
Other efficiency factors		
Log of per pupil property value	-0.2409474	-7.665
Log of median family income	-0.368901	-3.771
Ratio of matching aid to median income	-0.0729103	-2.562
Log of tax share	0.2455416	2.669
City district (1=yes)	-0.0022302	-0.075
Log of area in square miles	0.0135248	1.515
Herfendahl measure of public school concentration	-0.0478602	-0.488
Percent of county students in private schools	-0.1942125	-1.253
Percent of adults with collect education	0.3793539	2.417
Omitted outcome measures		
Percent of grade taking Regents exam in:		
English	0.07289	1.478
Earth science	0.14391	3.752
Global studies	-0.02484	-0.429
History	-0.0061	-0.096
Math I	-0.0218	-0.465
Math II	-0.01653	-0.23
Math III	0.26874	3.719
Biology	0.13973	2.393
Chemistry	0.09997	1.686
Physics	0.01667	0.269
Per pupil art and music facilities	-1.955972	-1.444
Per pupil video equipment	-0.1310507	-0.959
Per pupil personal computers	-0.6864052	-1.55
Per pupil network facilities	-16.0502	-1.91
Cost factors		
Log of teacher salaries	-0.1421024	-1.691
Log of enrollment	0.8351809	2.65
Square of log of enrollment	-0.1007119	-2.731
Cubic of log of enrollment	0.0038765	2.779
Percent of children in poverty	-0.1443877	-0.779
Percent female-headed households	0.2997681	0.805
Percent of students with severe handicap	0.0089417	0.018
Percent of students with limited English	-1.893981	-2.677
Percent of students in high school	-0.1769601	-0.868
Weighted pupil index	0.2965195	3.784
Number of Observations	631	

[a] Estimated with a Tobit regression; OLS results are similar. The dependent variable is the logarithm of the efficiency index.

[b] Districts are divided into 16 classes based on per pupil property value and enrollment; the aid variable is from the demand model (all lump-sum aid divided by income); "within-class" is the difference between a district's aid and the average aid in its class; "between-class" is the average aid in its class.

Region of State	Total # of districts	New aid	New aid 2*budget
Standard imposed- 25th percentile (6,843)[b]			
Downstate			
Small cities	7	0	2
Suburbs	130	6	22
New York City	1	1	1
Yonkers	1	0	1
Upstate			
Large cities	3	3	3
Rural	211	35	163
Small cities	47	7	40
Suburbs	231	18	136
Standard imposed- 50th percentile (8,444)[b]			
Downstate			
Small cities	7	0	2
Suburbs	130	6	12
New York City	1	1	1
Yonkers	1	0	0
Upstate			
Large cities	3	2	3
Rural	211	24	120
Small cities	47	2	26
Suburbs	231	10	82
Standard imposed- 75th percentile (10,125.3)[b]			
Downstate			
Small cities	7	0	1
Suburbs	130	5	9
New York City	1	1	1
Yonkers	1	0	0
Upstate			
Large cities	3	1	3
Rural	211	16	82
Small cities	47	2	16
Suburbs	231	8	48

0.112398	0.129607
0.120638	0.128694
0.111945	0.461286
0.137388	0.269723
0.09161	0.227508
0.07218	0.081982
0.072507	0.091131
0.072304	0.074976

0.112398	0.159109
0.120638	0.138817
0.111945	0.582641
0.137388	0.316081
0.09161	0.299694
0.07218	0.100644
0.072507	0.118302
0.072304	0.084777

0.112398	0.19859
0.120638	0.154925
0.111945	0.710056
0.137388	0.364753
0.09161	0.375485
0.07218	0.130933
0.072507	0.155246
0.072304	0.105006