Education Finance Reform in New York:
Calculating the Cost of a "Sound Basic
Education" in New York City

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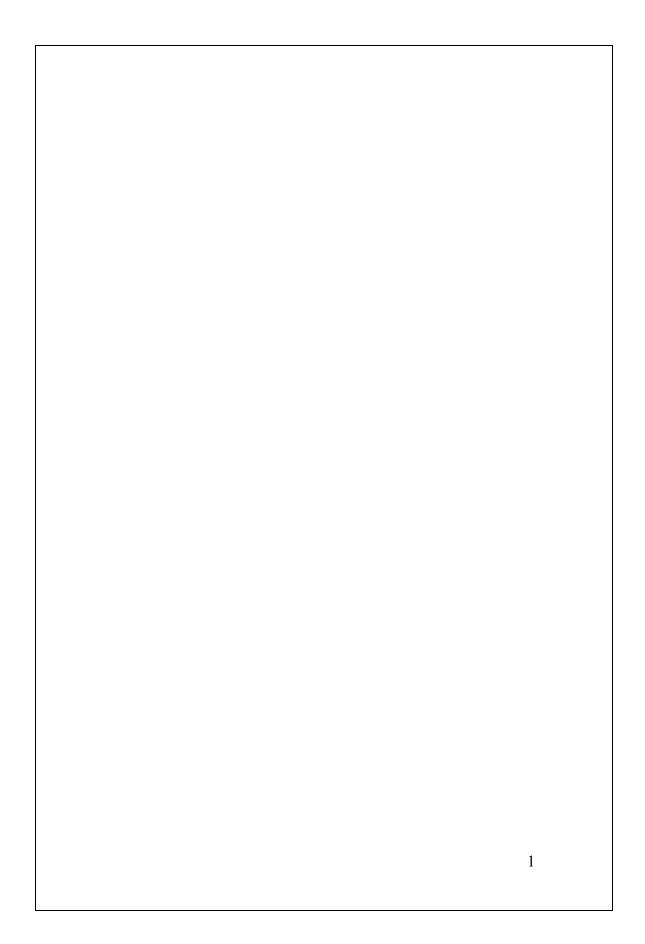
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Policy Brief

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Introduction

In June, 2003, the New York State Court of Appeals altered the education-finance landscape with its ruling in *Campaign for Fiscal Equity v. New York*. This ruling called for "[r]eforms to the current system of financing school funding" designed to ensure "that every school in New York City would have the resources necessary for providing the opportunity for a sound basic education."[1] This ruling addressed a wide range of issues, but also declared that "the funding level necessary to provide City students with the opportunity for a sound basic education is an ascertainable starting point." This policy brief addresses the question: How can this funding level be determined?

Any calculation of the cost of a "sound basic education" must begin with a definition of this term, that is, with a decision about the educational standard every district is supposed to reach. This is a decision to be made by lawmakers, with input from the Court of Appeals. We begin with an overview of the issues that arise in making this decision, and then turn to the main concern of this policy brief, namely, how to calculate the cost of a sound basic education once it has been defined by lawmakers.

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Defining a Sound Basic Education

A debate about the definition of a sound basic education is equivalent to a debate about the minimal educational performance, also called the educational adequacy standard, that New York State should set.[2] The Court of Appeals gives some guidelines on this issue, but does not provide a specific definition. Moreover, the Court's decision simply provides guidelines for its own *minimum* standard; nothing in the Court's decision prohibits state lawmakers from selecting a standard above the one that the Court would accept.

The New York Board of Regents has defined a set of Learning Standards for the schoolchildren in the state (New York State Education Department, 2004), but the Court of Appeals explicitly rejected these standards as the definition of a sound basic education. "[S]o to enshrine the Learning Standards," says the Court, "would be to cede to a state agency the power to define a constitutional right." Moreover, these Learning Standards appear to be higher than the minimum standards required by the Court. The Learning Standards describe an "intellectually powerful education" and they cover a wide range of subjects, including English, mathematics, social studies, a foreign language, the arts, and physical education (NYSED, 2004). In contrast, the Court's decision says that "[t]he issue to be resolved by the evidence is whether the State affords New York City schoolchildren the opportunity for a meaningful high school education, one which prepares them to function productively as civic participants." In short, state lawmakers could select the current Learning Standards as their target performance standard if they want to, but they are by no means required to do so, and indeed, they cannot simply turn the responsibility for defining a sound basic education over to the Regents.

Two recent reports on education finance reform in New York are based on the Regents Standards. The preliminary costing-out report recently released by the Campaign for Fiscal Equity (Chambers et al., 2004) argues that the standard should be an education system that "provide[s] an opportunity for all children to meet the Regents Learning Standards" (Chambers et al., 2004, p. i).[3] A recent education aid reform proposal by NYSED (2003) expresses a similar goal, namely that "all students have the opportunity to achieve the State's learning standards."

A related way to define a performance standard comes out of some of our work (Duncombe, Lukemeyer, and Yinger, 2003). We create an index based on passing rates for elementary, middle-school, and high-school mathematics and English exams, with a much higher weight on the exams from high school, which are the exams incorporated into the Regents Learning Standards.[4] The maximum possible value of this index, which corresponds to all students passing all tests, is 200, and the index has a value of 160 in the state's average district. This index also highlights the range in student performance across the state, as it reaches 169 in the average downstate suburb but is only 103 in New York City. One possible target for a revised state education finance system is to bring all districts up to the current state average of 160. A less ambitious target would be to bring all districts up to an index value of 130, which is still well above the level in the lowest-performing districts.

Costing Out, Overview

Once an educational performance standard has been selected, lawmakers face the task of determining how much it would cost to reach this standard in every district. Following the Court of Appeals ruling in the *CFE* case, we focus on the cost of achieving this standard, that is, of providing a sound basic education, in New York City, but our analysis can be applied to any other district in the state as well. Our approach is to calculate the cost of a sound basic education in the City in four steps. The first step is to calculate the cost of a sound basic education in a typical school district in New York State; the second step is calculate the extent to which the cost of attracting teachers raises educational costs in the City relative to those in this typical district; the third step is to calculate the extent to which the City must pay more than the typical district because it has a relatively high share of disadvantaged students; and the fourth step is to combine the first three steps to determine the cost of a sound basic education in the City. The next four sections of this policy brief examine these four steps. The final section offers some conclusions and policy implications.

Costing Out, Step 1: The Cost of a Sound Basic Education in a Typical District

Three approaches have been used to calculate the cost of a sound basic education: the professional judgment approach (also called the resource cost model), the successful schools approach, and the cost estimation

approach. Each of these approaches has been developed in the scholarly literature.[5] Moreover, each of these approaches has been used in various states around the country. The professional judgment approach has recently been used in Maryland, Minnesota, and Wyoming (Chambers et al., 2004), for example, and an aid program based on the cost estimation approach was implemented in Massachusetts (Bradbury et al., 1984).[6]

In New York, the professional judgment approach appears in the preliminary costing-out study just released by CFE (Chambers et al., 2004). According to a recent press release, the successful schools approach is being used by Standard and Poor's in work done for Governor Pataki's education finance reform commission (Standard and Poor's, 2004; Yan, 2004). The cost estimation approach appears in recent work of ours (Duncombe, 2002; Duncombe and Lukemeyer, 2002; Duncombe, Lukemeyer, and Yinger, 2003).[7]

Each of these three approaches provides a reasonable way to address the first step in a costing-out analysis, but they proceed in quite different ways.

- The professional judgment approach asks educators to list the staffing and program needs that a typical school requires to achieve a given set of student performance standards. The CFE report, for example, asked educators to determine the set of "instructional programs necessary to provide an opportunity for all children to meet the Regents Learning Standards" and then to "specify resource requirements needed to deliver those programs" (Chambers et al., 2004, p. i).

- The successful schools approach identifies schools that are thought to provide a sound basic education and then determines the lowest per-pupil spending in this set of schools (excluding schools with relatively high incomes or property values). This spending level is used as a measure of the minimum spending needed to provide a sound basic education.

- The cost estimation approach collects information on spending, student performance, and other variables for all the school districts in the state and then uses statistical procedures to determine how spending levels vary with student performance indicators, controlling for factors outside a district's control. The cost of a

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sound basic education is the level of spending required to meet a selected performance standard in a school district with average characteristics.

These three approaches lead to similar estimates of the per-pupil cost of a sound basic education for any given performance standard. This point is illustrated in Table 1, which presents various estimates of this cost. The first row presents the cost estimate from the CFE report (Chambers et al., 2004). This estimate, $12,500, combines the professional judgment approach and a very high performance standard, namely, providing "an opportunity for all children to meet the Regents Learning Standards."

Table 1. The Per-Pupil Cost of a Sound Basic Education in a Typical District, by Approach and by Student Performance Standard					
	Student Performance Standard				
	130	140	150	160	CFE
Professional Judgment					$12,520
Teacher Cost		$9,510	$9,629	$10,038	
Successful Schools		$10,280	$10,375	$10,812	
Cost Estimation	$8,626	$9,301	$10,027	$10,811	
Notes: The estimates in the first row are based on Chambers et al. (2004). The estimates in the next three rows are based on Duncombe and Lukemeyer (2002), except for the entry in the first column, which comes from Duncombe, Lukemeyer, and Yinger (2003). The estimates in the last three rows are adjusted for the growth in per pupil spending between 2000 (the year on which they are based) and 2002 (the year on which the entry in the first row is based.					

The second row is based on Duncombe and Lukemeyer (2002) and uses the student performance index described earlier. It provides cost estimates for various performance standards using an approach, which we call the teacher cost approach, that combines features of the professional judgment approach and the successful schools approach. To be specific, it observes staffing ratios in successful schools and calculates how much it would cost to reach those staffing ratios. According to this approach, the estimated cost ranges from $9,510 to $10,038 per pupil, depending on the student performance standard.

The third row is based on the successful schools approach, as implemented by Duncombe and Lukemeyer (2002).[8] This approach

yields a similar answer to the teacher cost approach when the performance standard is an index value of 160, but with this approach the estimated cost does not drop very much as the performance standard is lowered. This feature of the results reflects a limitation of the successful schools approach, discussed in more detail below, namely, that it does not adequately account for all the factors that influence school spending.[9]

The final row in Table 1 presents results using the cost estimation approach (Duncombe and Lukemeyer, 2002; Duncombe, Lukemeyer, and Yinger, 2003). These estimates range from $8,626 (with a performance standard of 130) to $10,811 (standard of 160). The results in this row are very similar to those in the second row and, for a performance standard of 160, in the third row, as well.

Overall, these results suggest that the main issue in calculating the cost of a sound basic education in a typical district is the selection of a performance standard, not the choice of an approach. The teacher cost and cost estimation approaches yield similar estimates of the cost of a sound basic education when they are based on the same performance standard. Moreover, extrapolating these results to the higher standard in the CFE report suggests that these two approaches and the professional judgment approach also yield similar cost estimates when the standard is the same. Finally, the successful schools approach yields a result that is similar to that of the other approaches for a performance standard of 160, but does not appear to be as well suited as the other approaches for estimating how costs change as the performance standard changes.

Costing Out, Step 2: The Added Costs of Attracting Teachers to New York City

Most scholars agree that educational costs vary across school districts due to differences in wage costs. This factor must be considered in any costing-out calculation. The focus here is not on actual wages, which are set by school officials, but is instead on the wage each district must pay to attract a teacher of given quality. This wage cost is outside a district's control. To be more specific, wage costs differ from one school district to the next both because of differences in the cost of living and because some districts have more favorable teaching environments than others. A district with a high cost of living or with many disadvantaged students, for example, must pay more than other districts to attach teachers of equal quality.

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The fact that some districts must pay more than others to attract teachers of a given quality is also recognized in many state education aid formulas. To be specific, Huang (2004) reports that 11 states include wage or cost-of-living adjustments in some of their education aid programs. The problem is that wage costs cannot be easily estimated because these costs are not the same as the wages districts actually pay.

Several methods have been developed to estimate wage costs. These methods are not directly linked to the three approaches described earlier for estimating the cost of a sound basic education in a typical district. The best method for isolating the underlying wage-cost concept depends on the type of information that is available. Once wage costs are determined, they can be added to any of the three main approaches for calculating the cost of a sound basic education.

Most scholars prefer to collect data on wages, teacher quality, local labor market conditions, and the teaching environment and then to estimate, using statistical methods, how these factors affect wages. This approach makes it possible to calculate the wages a district would have to pay to attract teachers of any specified quality, given its overall labor market conditions and teaching environment. The problem, however, is that the data needed to accurately measure teacher quality and other factors are often not available.

This data problem is illustrated in the preliminary costing-out report released by CFE (Chambers et al., 2004). This report estimates wage differences based on this type of statistical analysis but ends up with implausible results. To be specific, this report claims that the cost of teachers is only 4 percent higher in New York City than in the average district in the state, and only 1 percent higher in New York City than in the New York City suburbs. It seems unlikely that New York City, with its high cost of living and challenging teaching environment, could attract the same quality teachers as an average district by paying only 4 percent more. Although the underlying statistical analysis is not presented in this preliminary report, our experience with the New York data leads us to believe that these implausible results probably reflect problems with the way the study measured both teacher quality and the cost of living.[10]

Studies of other states have found much larger variation in teacher wage costs across school districts. See, for example, the analysis of

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wage costs in Texas conducted for the Texas State Legislature (Alexander et al., 2000). Moreover, other studies based on New York data yield substantially different results. Using alternative methods to account for teacher quality and the cost of living, for example, Duncombe, Lukemeyer, and Yinger (2003) estimate that wage costs are 54 percent above the state average in New York City and 13 percent above the state average in downstate suburbs.

Other methods for calculating wage costs are also available. A report released by the NYSED, for example, developed a regional wage cost index based on "median salaries in professional occupations that require similar credentials to that of positions in the education field (NYSED, The State Aid Work Group, 2003). This study finds that wage costs are 49.6 percent higher in the downstate region than in the rest of the state. This study did not consider the impact of a challenging classroom environment on the wage a school district would have to pay, however, and therefore has the same index value for New York City and its suburbs.

Costing Out, Step 3:Calculating the Added Costs of Educating Disadvantaged Students

The third step in determining the cost of achieving a sound basic education in New York City concerns the costs of educating disadvantaged students. A large literature demonstrates that it costs more to educate students who are poor, who have limited English proficiency, or who have disabilities, than it does to educate a student without any of these disadvantages.[11] As a result, the per-pupil cost at any given performance standard is higher in New York City, where students with disadvantages are concentrated, than in the typical district.

Any attempt to calculate the added costs of disadvantaged students faces three challenges:

(1) It is difficult to untangle the effects of the many different factors that influence school spending and student performance.

(2) There exists little scientific evidence about the effectiveness of various programs in boosting the performance of disadvantaged students.

(3) Examples of high student performance in poor, urban school districts are difficult, if not impossible, to find.

In the following discussion, we show how these challenges are addressed by each of the three main approaches to costing out.

The Professional Judgment Approach

The preliminary CFE report (Chambers et al., 2004) argues that this step can be accomplished with the professional judgment approach. In particular, the professional educators involved in this approach are asked to identify a set of extra programs that would bring a school up to the performance target when many of the students are poor or speak English as a second language. The extra cost of educating these students is then the cost of implementing these extra programs.

This approach relies on the judgment of educators to overcome the three challenges listed earlier. Educators must draw on their experience to identify the factors that account for the poor performance of students in poor urban schools and then to select a set of programs that will offset those factors. This is a difficult task both because so many factors influence student performance and because there is little consensus about which programs can successfully offset student disadvantages. Moreover, few educators have the experience in implementing programs that succeed in raising student performance in a school where disadvantages are concentrated. Instead, the CFE study and other applications of this approach draw on educators with a variety of backgrounds, some from urban schools and some from suburban schools. It is not clear how experience in a suburban school reveals the best programs to boost performance in an urban school, and it is not clear how experience in a low-performing urban school identifies programs that would boost those schools up to a high performance standard. The people who participate in this approach are experienced, dedicated professionals, but, through no fault of their own, their experience will give them little help when it comes time to identify the extra programs needed to bring disadvantaged students up to a performance standard.

The professional judgment approach is analogous to assembling a panel of experienced farmers to figure out what combinations of fertilizers and equipment could raise the crop yield on some low-yielding acres to a specific target that is significantly higher that the yield produced there so far—and then to calculate how much these combinations cost.

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Suppose that different plots of land receive different amounts of sunlight, a factor clearly outside farmers' control, and that the lowest-sunlight plots tend to have the lowest yields. The panel's task is to make an educated guess about the combination of fertilizers and equipment that is needed to reach the target yield on the plots in each sunlight category, including the plots that receive the lowest amount of sunlight. Experienced farmers would have some useful knowledge to draw on to complete this task, but they would have to try to untangle the roles of fertilizers, equipment, and sunlight in raising crop yield, and then to extrapolate to a situation that is outside their experience. They can do no better than an educated guess. Moreover, the higher the target yield, and hence the farther the target from current experience on low-sunlight plots, the harder it will be for these experts to determine what is needed.

One might think that educators can draw on research that demonstrates the impact of various programs on student performance. In fact, however, education programs are difficult to study and only limited evidence is available. There is extensive scientific evidence that class size reduction and pre-kindergarten programs can boost test scores, but it is hard to find a consensus on any other type of program.[12] The preliminary CFE report includes pre-kindergarten programs for all schools and some modest class size reductions in high-poverty schools, but based on the results in the scholarly literature, these changes are not quite sufficient to bring poor urban schools up to any reasonable performance standard—let alone to the high performance standard on which the CFE report is based.

The Successful Schools Approach

To find the impact of poverty on educational costs, the successful schools approach compares the lowest per-pupil spending observed among high-poverty schools that meet the performance targets with the lowest per-pupil spending observed among low-poverty schools that meet the performance targets. These observed differences in spending are interpreted as a measure of the added cost of educating students from poor families.

This approach stumbles, however, over the first and third challenges. First, comparisons across schools inevitably do not hold other things constant. One high-poverty school might have higher performance than another, for example, not because it has different programs, but because

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it operates in a lower-wage labor market and can hire more highly qualified teachers for the same wage.

Second, the school districts in the state with the highest poverty rates all have low student performance, so high-performing, high-poverty schools cannot be observed. To come up with schools that meet the performance standard, therefore, the successful schools approach must lump New York City with schools that have much lower poverty rates, so that it will inevitably understate the cost impacts of the concentrated disadvantage among students in the City. Moreover, this problem gets worse as the performance standard increases. With a very high performance standard, such as one set by the Regents, few school districts anywhere in the state currently meet the standard and successful school districts with high poverty rates simply do not exist.

To return to the farming analogy, the successful schools approach is like assuming that the cost of achieving a given yield target is the minimum amount spent growing crops on plots that currently have a high yield. The extra costs imposed by low sunlight are identified by comparing the minimum spending observed in high-sunlight and low-sunlight plots that meet the target. This approach is not compelling, however, because the causes of high yields on a given plot are not identified. Perhaps relatively little is spent on one plot, for example, because the proximity of a stream lowers the costs of watering the crops. Moreover, the approach breaks down when none of the low-sunlight plots have high yields; in this case it is not possible to observe the extra costs needed to meet the target on low-sunlight plots.

The Cost Estimation Approach

The cost estimation approach uses statistical procedures to determine the impact of poverty and limited English proficiency on educational costs, holding student performance and other factors constant. Thus, it is specifically designed to address the first challenge.[13] This strategy does not identify any particular programs for boosting the performance of disadvantaged students; instead, it addresses the second challenge by determining, based on observed spending patterns in the state, the minimum spending needed to achieve any given performance standard with any particular concentration of student disadvantages.

Turning to the third challenge, the statistical procedure on which this approach is based provides direct estimates of the added costs facing

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schools with disadvantaged students. Because this procedure holds student performance constant, these estimates apply to schools at all performance levels. These are, of course, still estimates, but they are estimates based on current cost experiences in all the state's school districts, including those with both high and low student performance and those with high and low student disadvantage.[14] These estimates can be used to calculate either a cost index, which indicates how much each district would have to spend, relative to the state average, to reach any performance standard, or to calculate a weight that indicates the extra cost of each student in poverty, with limited English proficiency, or with a disability. Once a performance standard is selected, the cost index or the student weights can be used to calculate how much it would cost each district to reach the standard.

In the farming analogy, the cost estimation approach begins by collecting information on spending, crop yields, fertilizer and equipment use, input costs, sunlight, and other relevant variables. The next step is to conduct a statistical analysis of spending as a function of these other variables. In effect, this analysis determines the impact of sunlight on the amount a farmer must spend to achieve any given crop yield, holding other variables constant. As a result, this analysis yields an estimate of how much more a farmer must spend on a low-sunlight plot than on a high-sunlight plot to achieve the same crop yield. This is precisely the information needed to complete the third step of a costing-out exercise.

Some observers dismiss the cost approach because it requires advanced statistical procedures, which are not as transparent as the procedures used in the other two approaches. As one study put it, the technical complexity of this approach makes it difficult to explain to "reasonably well-educated policymakers" (Guthrie and Rothstein, 1999, p. 223).

We do not find this argument compelling. A recent survey (Huang, 2004) finds, for example, that 18 states use extra weights for poor students, students with limited English proficiency, or both in their education aid formulas.[15] Although most of these weights are derived in an ad hoc manner and are far lower than the weights in the scholarly literature, they nevertheless are consistent with the cost estimation approach.[16] Moreover, weights similar to those found in the cost estimation research are included in state aid programs in New Hampshire and Maryland[17] and in the aid proposal released by NYSED

in 2003.[18] The logic of student weights is clearly not beyond the understanding of state legislators, well-educated or not. Moreover, as mentioned earlier, the complexity of this problem did not prevent Massachusetts from implementing a state aid formula based on the cost estimation approach.

The problem of estimating the costs of disadvantaged students is analogous in some ways to the problem of estimating state revenues, a key issue in preparing a state budget. States around the country base their revenue estimates in part on complex macroeconomic models of the state economy. Legislators may not understand the technical details of these models, but they understand the need for accurate revenue estimation. Legislators know that a state will not meet its responsibilities by selecting a simplistic solution to a complex problem.

Critics of the cost estimation approach also claim that it is abstract and disconnected from the everyday decisions of schools because it does not identify a specific set of successful programs or a particular successful school. As pointed out earlier, however, the cost approach makes full use of available information on the relationship between spending and student performance throughout the state. It does not identify specific programs but instead examines current best practice in the state to determine the minimum spending required to reach a performance standard with any given student mix.[19]

Moreover, the apparent connections to specific programs and schools in the other approaches are illusory. The professional judgment approach does not really identify a set of programs that can raise high poverty schools to the target performance level, but instead only provides an educated guess as to what such programs might look like. The successful schools approach does not really identify a high-poverty school district that achieves the target performance level; instead, this approach finds a high-performing school with above-average poverty and then makes the implausible assumption that the highest-poverty schools could reach the same performance level if they spent as much as this school.

Finally, some critics argue that the cost estimation studies are limited because they "necessarily rely on a limited number of outcome (achievement) measures" (Guthrie and Rothstein, 1999, p. 220). These critics go on to say that "many of the desirable outcomes…are not presently measured and cannot be quantified for use in such a statistical

model." It is, of course, true that some desirable outcomes, such as good citizenship, cannot be quantified, but if they cannot, then no approach can determine whether any district provides them, let alone how much extra more it would costs to achieve these outcomes in a high-poverty district. The cost estimation approach cannot be blamed for the complexity of educational outcomes![20] Moreover, any outcome that can be measured can readily be included in the cost estimation.[21]

A Comparison of Results

The preliminary report commissioned by CFE (Chambers et al., 2004) concludes that the Regents standards could be achieved with programs that cost 16.6 percent more in New York City than in a district with an average ratio of need to capacity.[22] This result combines the wage cost adjustment described earlier and an adjustment for the extra programs needed to educate disadvantaged students. By removing the wage increment for New York City, which was discussed earlier, this estimate indicates that New York City needs to spend only 12.1 percent more than the average district, because it has so many disadvantaged students.[23] In our judgment, these results reflect the weaknesses of the professional judgment approach. Given the large performance gaps that now exist, we do not find it plausible that, holding wages constant, New York City could reach the high standard in the CFE report by spending only 12.1 percent more per pupil than the average district in the state.

Applications of the cost estimation approach to New York yield very different results than those in the CFE report. To be specific, Duncombe, Lukemeyer, and Yinger (2003) estimate that the per-pupil cost of education in New York City is 36 percent above the state average based on student needs alone. These estimates correspond to an extra cost weight of about 1.2 for a student in poverty and of 1.0 for a student with limited English proficiency.[24] These weights are close to the weights in the Maryland aid program and, in the case of poverty, in the aid program proposed by the NYSED (2003).

Costing Out, Step 4:The Cost of a Sound Basic Education in New York City

The cost of a sound basic education in New York City equals the cost of a sound basic education in a typical district in the state (Table 1) adjusted for the relatively high wages and the relatively high concentration of disadvantaged students in New York City. There is no reason why different methods cannot be used for the three different steps of this calculation. Thus, for example, the professional judgment approach could be used for the first step (the cost in a typical district), an analysis of wages in comparable occupations could be used for the second step (teacher wages), and estimated weights for pupils in disadvantaged groups could be used for the third step (pupil needs).

Table 2.	The Per-Pupil Cost of a Sound Basic Education in New York City, by Approach and by Student Performance Standard				
	Combination of Wage and Student Need Adjustment				
Approach (and standard) for Determining the Cost in a Typical District	Wage: CFE		Wage: SED		Wage: DLY
	Need: CFE	Need: Cost	Need: CFE	Need: Cost	Need: Cost
Professional Judgment (Regents Learning Standards)	$14,601	$17,708	$21,003	$25,473	$26,222
Teacher Cost (Index Value of 160)	$11,706	$14,198	$16,839	$20,423	$21,024
Cost Estimation (Index Value of 160)	$12,608	$15,291	$18,136	$21,996	$22,643
Cost Estimation (Index Value of 130)	$10,060	$12,201	$14,471	$17,550	$18,066

Notes: The figures in this table equal the figures in Table 1 adjusted for the estimated wage costs and pupil needs in New York City. The row labels indicate the starting point from Table 1. The column headings come in two parts. The first part indicates the method for making the wage cost adjustment; CFE is the index in Chambers et al. (2004); SED is the index in NYSED, State Aid Work Group (2003); DLY is the index in Duncombe, Lukemeyer and Yinger (2003). The second part indicates the method for making the pupil need adjustment; CFE is the adjustment in Chambers et al. (2004); Cost is the cost index in Duncombe, Lukemeyer and Yinger (2003).

Table 2 presents estimates of the cost of a sound basic education in New York City using a variety of different calculations. The first row presents the results based on the student performance standard in the CFE report (Chambers et al., 2004). All the entries in this row begin with the estimated cost in a typical district from Table 1, namely $12,520. The columns then adjust this estimate using various

approaches to both teacher costs and student disadvantage. The first two column uses the wage index in the CFE report; the first column combines this with the CFE estimates of pupil needs, and the second combines it with the student need index estimated by Duncombe, Lukemeyer, and Yinger (2003). The next two columns use the wage estimate by NYSED, State Aid Work Group (2003). The third column combines this wage estimate with the CFE estimate of the cost of disadvantaged students, and the fourth column combines it with the Duncombe, Lukemeyer, and Yinger (DLY) index of student needs. Finally, the fifth column combines the DLY estimate of wage costs and the DLY index of student needs.

As this table makes clear, the choice of an estimating method for wage costs and the costs of student disadvantage makes a huge difference in the estimated cost of a sound basic education in New York City. The approach in the CFE report, which we believe dramatically understates the cost disadvantages of New York City, produces an estimate of $14,601. Bringing in a more reasonable student need estimate (column 2) or a more reasonable wage index (column 3) boosts the estimated cost by at least 20 percent. Moreover, introducing reasonable calculations for both wages and student needs raises the cost estimate by over 70 percent, to a figure above $25,000 per pupil.

The same lesson appears in the other rows. The second row describes the educational cost in a typical district found using the teacher cost approach and a student performance index of 160 ($10,038 in Table 1). The next two rows make use of the cost estimation approach; row three is based on a student performance index of 160 ($10,811 in Table 1) and row four is based on a student performance index of 130 ($8,626 in Table 1). The wage and student need adjustments for New York City in the CFE report (first column) boost each of these starting points by 16.6 percent, whereas the comparable adjustments in Duncombe, Lukemeyer, and Yinger (2003) (last column) boost these starting points by 109.4 percent—over 6 times as much.

The importance of accurate cost adjustment can be demonstrated by comparing the entry in the first column and first row of Table 2 with the entry in the last column of the last row. The first of these entries, $14,601, corresponds to the high performance standard in the CFE report combined with the CFE's underestimated wage and student need adjustments. The second entry, $18,066, corresponds to a performance standard well below the current performance level in the average

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school district in the state combined with a more accurate estimate of New York City's added costs due to high wages and student needs. In terms of impact on the cost of a sound basic education in New York City, the selection of adjustments for wage costs and student needs is even more important than the selection of a student performance standard.

Conclusions

After lawmakers have defined a sound basic education, any calculation of the cost of achieving this performance standard in New York City must (1) estimate the cost of reaching this standard in a typical district, (2) adjust this cost estimate for the relatively high wage costs in the City, and (3) adjust this cost estimate for the relatively high student needs in the City. Although several approaches are available for undertaking the first step, they all lead to approximately the same answer when they are applied to the same student performance standard. One possible exception to this rule is that the successful schools approach appears to understate how much educational costs change when the performance standard is raised or lowered.

The second and third steps raise difficult technical issues about the best way to use available information to identify variation across districts in wage costs and in the costs of educating disadvantaged students. These issues are particularly important in New York because New York City has higher wage costs and a higher concentration of disadvantaged students than virtually any other district in the state. The approaches used for these steps, therefore have an enormous impact on the estimated cost of a sound basic education in the City.

Unfortunately, however, two of the approaches that have been used to carry out the third step, namely, the professional judgment approach and the successful schools approach, have serious limitations that lead them to understate the extent to which costs in the City exceed those in the average district. These approaches have intuitive appeal because they appear to be linked to specific educational programs and to specific successful schools. In fact, however, this linkage is a mirage because it is not possible to identify either the programs that would bring schools with high student needs up to the performance standard or schools with high student needs in which the standard is already being met.

The cost estimation approach does not attempt to link to specific programs or schools, but it does make the best use of available information to estimate the impact of student needs on the cost of achieving any given performance standard. As a result, it provides the best solution to the third step in any costing-out study.

Estimating the cost of a sound basic education in New York City is, of course, only part of the requirements set forth by the Court of Appeals decision in the *CFE* case. Lawmakers in New York also must devise a new education finance system that enables New York City to fund a sound basic education; design an accountability system to help ensure that New York City uses its new funding in an efficient manner; and come up with some combination of new local taxes, new state taxes, and reductions in aid to low-need school districts that will pay for these reforms.[25] These are all serious challenges. Nevertheless, calculating the cost of a sound basic education in New York City is, as the Court of Appeals declared, "an ascertainable starting point." To meet the Court's requirements and be fair to the students in New York City, lawmakers should select a method for calculating this cost that accurately accounts for the City's high wages and high student needs.

Endnotes

1.   *Campaign for Fiscal Equity v. New York* (2003). This quotation is from page 51 of the manuscript version of the opinion (available at http://www.cfequity.org) and the quotation in the next sentence is from page 50.

2.   This debate is not unique to New York. The highest courts in several other states have called for minimum standards as well (Lukemeyer, 2004). For example, a widely decision by the Kentucky Supreme Court, *Rose v. Council for Better Education, Inc.* (1989), calls for an education providing all children with seven "capacities" including "sufficient oral and written communication skills to enable students to function in a complex and rapidly changing civilization."

For further discussion of education finance reform in other states, see Yinger (2004).

3.   The concept of an 'opportunity' to achieve is appealing because it recognizes that students bear some responsibility for their own academic achievement. Nevertheless, what constitutes an 'opportunity' is difficult to specify or measure. How can the 'opportunity' to meet the Regents Learning Standards be measured? Does it correspond to a particular passing rate on Regents exams?

4.   One important issue is neglected by this study and the two based on the Regents Learning Standards, namely, what to do about dropouts. No state should select a performance standard that gives schools an incentive to boost their passing rate by encouraging poor students to drop out. For studies that address this issue, see Duncombe and Yinger (1998, 2000).

5.   The professional judgment approach is discussed in Chambers et al. (2004) and Guthrie and Rothstein (1999); the successful schools approach is discussed in Augenblick (1993, 1997); the cost estimation approach is discussed in Bradbury, et al. (1984), Downes and Pogue (1994), Duncombe (2002), Duncombe, Lukemeyer and Yinger (2003), Duncombe, Ruggiero, and Yinger (1996), Duncombe and Yinger (1998, 2000), and Reschovsky and Imazeki (1998, 2001, 2003, 2004). All three methods are discussed in Duncombe and Lukemeyer (2002).

6.   The cost estimation approach was also used for a tax study commission in Nebraska (Ratcliffe, Riddle, and Yinger, 1990), and has been applied by scholars to Arizona (Downes and Pogue, 1994), Kansas (Duncombe and Johnston, 2004), Michigan (Courant, Gramlich, and Loeb, 1995), Texas (Reschovsky and Imazeki, 2001, 2003, 2004), and Wisconsin (Reschovsky and Imazeki, 1998).

7.   A recent article in *The New York Time*s (February 5, 2004), claims that the preliminary study released by CFE "is the first in which anyone has tried to figure out the cost of making sure that every child in the city—or anywhere else in the state, for that matter—is able to obtain a Regents high school diploma." In fact, however, Duncombe (2002), Duncombe and Lukemeyer (2002), Duncombe, Lukemeyer,

and Yinger (2003), and NYSED (2003) all estimate the cost of reaching various standards based on the Regents exams. A similar misleading statement appears in CFE (2004, p. 9), namely "This educational model is the first in New York State to directly confront the critical issue of the precise level of resources needed to provide *all* students in the state the opportunity to meet the Regents Learning Standards."

8.   The NYSED proposal also uses the successful schools approach. As noted earlier, this proposal is based on an expressed performance standard similar to the one in the CFE report (Chambers et al., 2004). In practice, however, the version of the successful schools approach in the NYSED proposal appears to result in a much smaller estimate of the cost of a sound basic education. Although the NYSED report does not present an estimate of this cost and does not describe all its calculations in detail, we have attempted to estimate the cost of a sound basic education that is implicit in their approach. To make the NYSED figure comparable to those in Table 1, our calculations adjust for the unique features of the NYSED proposal, such as the fact that it does not include special education funding. We estimate that the implied cost of a sound basic education in the NYSED proposal is only about $8,000 per pupil.

9.   Duncombe and Lukemeyer (2002) show that the lack of cost variation across performance standards in New York appears to reflect a failure to account for differences in wage costs across districts; there is much more variation when a correction for wage costs, which is not usually part of the approach, is added.

10.   Indeed, a cost-of-living index, were one available, would be an improvement on the index in the CFE report. Moreover, the CFE report yields virtually identical predictions for wage costs in New York City relative to the rest of the state as a seriously flawed analysis based on national data by one of the authors of the CFE report (Chambers, 1998). A critique of this study is provided by Yinger (2001).

11.   See, for example, Downes and Pogue (1994), Duncombe, Ruggiero, and Yinger (1996), Duncombe and Yinger (1998, 2000), and Reschovsky and Imazeki (1998, 2001, 2003, 2004).

12.   See Krueger (1999) on class size and Karoly et al. (1998) on pre-kindergarten programs. There is no consensus on another widely used type of program, called whole-school reform. According to Ladd and Hansen (1999, p. 213), for example, these programs "have achieved popularity in spite rather than because of strong evidence of effectiveness and replicability."

13.   Statistical methods cannot be used, of course, unless a large number of school districts—and their characteristics—can be observed. This is not a problem in New York, which has almost 700 school districts. Moreover, even states with only a few school districts can make use of extra cost weights for disadvantaged students that have been estimated for similar states. These weights are discussed in the text.

14.   When the combination of high student performance and high student disadvantage is not observed, as it is not in New York, one cannot rule out the possibility that the cost impact of an increment in poverty, holding performance constant, is not the same at high performance levels and at low performance levels. This is not a disadvantage of the cost estimation approach relative to other methods, however, because it applies to all methods; the cost estimation approach still makes the best use of available information to estimate the cost impact of an increment of poverty at all observed levels of performance. Moreover, if, as seems likely, educational production is like other production processes, the cost of boosting performance one unit increases as the level of performance increases. If so, the inability to observe the combination of high performance and high disadvantage will cause any approach to underestimate the added cost from highly concentrated student disadvantage.

15.   Some states also use pupil weights for students with handicaps or use some method other than pupil weights to adjust for student disadvantages. Indeed, Huang finds that only three states distribute aid to local school districts without any type of cost adjustment.

16.   For estimated weights that apply to various student disadvantages, see Reschovsky and Imazeki (1998), Duncombe (2002),

Duncombe, Lukemeyer, and Yinger (2003), and Duncombe and Yinger (2004).

17.   See Huang (2004). The weights in Maryland come from a report commissioned by the legislature: Maryland Commission on Education Finance, Equity, and Excellence (2002). They are based on the professional judgment approach. The judgment about the added costs of poor students by the educators who participated in the Maryland panels obviously differed from that by the educators on the New York panels.

18.   In this proposal, each poor student in a high-poverty school district, such as New York City, receives an extra weight of 100 percent. This weight will later be phased down to 80 percent. The NYSED proposal does not include an extra cost weight for students with limited English proficiency, however.

19.   As with any statistical procedure, different scholars may come to different conclusions about the specific variables to include or about other technical issues. An open technical debate is therefore an important part of the process of implementing the cost estimation approach. The range of possible outcomes should not be exaggerated, however. Citing a publication of ours (Duncombe, Ruggiero, and Yinger, 1996), Guthrie and Rothstein (1999, p. 221) claim that an analysis based on the "preferred 'indirect' measure" of education performance leads to "widely divergent" cost results from an analysis based on "'direct' performance measures." In fact, however, our publication makes it clear that the use of "direct" performance measures is an innovation that clearly improves on earlier studies that used "indirect" measures. Alternative sets of direct measures lead to fairly similar cost results. Moreover, as shown in footnote 17, the educated guesses in the professional judgment approach sometimes yield widely divergent results themselves.

20.   Guthrie and Rothstein (1999, p. 221) also argue that the cost estimation approach falls short because it cannot identify the resources each district would have to reach a performance target if those resources were "used efficiently." This is another example of blaming the cost estimation approach for the complexity of the world.

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Efficiency cannot be directly measured and no approach can fully account for it. Professional educators can, of course, make a guess about the resources that would be needed if "used efficiently," but they can do no more than guess. It is true, as Guthrie and Rothstein point out, that the cost estimation approach must use "indirect" controls for district efficiency, but because efficiency cannot be directly measured, no other method can do any better. Guthrie and Rothstein offer no evidence to support their claim that educator guesses are better than indirect statistical controls. For a thoughtful discussion of the linkages between state education aid and school district accountability, see Figlio (2004).

21.   Guthrie and Rothstein (1999, p. 220) also argue that "[i]ncorporating additional achievement measures would…inject unknown errors into the results" because of a statistical problem known as multicollinearity. This argument is highly misleading, at best. Multicollinearity arises when two or more variables (in this case, outcome variables) are so closely related that it is impossible to separate their impacts on another variable (in this case, spending per pupil). If it exists (and Guthrie and Rothstein offer no evidence that it does), this problem is a feature of the world, not a problem with statistical procedures. The professional judgment approach and the successful schools approach are even less equipped to solve this problem than is the cost estimation approach.

22.   Chambers et al. (2004, Exhibit C) present the cost of a sound basic education for a district with an average ratio of need to capacity but do not present this cost for the average district in the state. They do present an estimate for the average student in the state ($12,520) and for districts with a low ratio of need to capacity ($11,841). Using either of these figures as a base would *lower* the student need correction for New York City.

23.   This estimate is found by dividing 1.166 by 1.04 and then subtracting 1.0.

24.   These are our latest weight estimates, which come from Duncombe and Yinger (2004). They are based on an equation that includes students receiving special education (weight of 2.0).

25.   An extended discussion of all these issues can be found in Yinger (2004).

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