



Unpacking Racial Disparities in School Spending: Why “progressiveness” and “comparability” are not enough

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Studies of racial and economic disparities in school funding typically rely on simple spending comparisons or “progressiveness” measures that ignore variation in the cost of achieving common educational outcomes. This article argues that such approaches essentially ignore how much it costs schools in order to provide students with an adequate opportunity to learn. Simplistic spending measures tend to mask the degree of inadequacy, or even reverse the true pattern of inequity. Using national district-level data from the School Finance Indicators Database and National Education Cost Model alongside school-level cost models from five states (New York, New Jersey, Oregon, Colorado, and Delaware), we compare nominal and cost-adjusted (“adequacy”) measures of spending with respect to race and poverty. Nominal spending patterns appear modestly progressive with respect to child poverty and Black and Hispanic enrollment shares nationally and within most states. However, when spending is benchmarked against the cost of achieving common outcome goals, the pattern reverses: districts and schools serving larger shares of Black, Hispanic, and low-income students are systematically further below adequate funding levels, and adequacy explains far more outcome variation than relative spending alone. Detailed case studies of large and mid-sized New York and New Jersey districts further show that between-district underfunding constrains the capacity of high-poverty districts to equalize resources across their own schools. We conclude that cost modeling is the more valid and policy-relevant method for evaluating equal educational opportunity, and that continued reliance on simpler comparability and progressiveness measures risks understating racial and economic disparities in school funding and misdirecting policy remedies.

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Unpacking Racial Disparities in School Spending: Why “progressiveness” and “comparability” are not enough

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Abstract

Studies of racial and economic disparities in school funding typically rely on simple spending comparisons or "progressiveness" measures that ignore variation in the cost of achieving common educational outcomes. This article argues that such approaches essentially ignore how much it costs schools in order to provide students with an adequate opportunity to learn. Simplistic spending measures tend to mask the degree of inadequacy, or even reverse the true pattern of inequity. Using national district-level data from the School Finance Indicators Database and National Education Cost Model alongside school-level cost models from five states (New York, New Jersey, Oregon, Colorado, and Delaware), we compare nominal and cost-adjusted ("adequacy") measures of spending with respect to race and poverty. Nominal spending patterns appear modestly progressive with respect to child poverty and Black and Hispanic enrollment shares nationally and within most states. However, when spending is benchmarked against the cost of achieving common outcome goals, the pattern reverses: districts and schools serving larger shares of Black, Hispanic, and low-income students are systematically further below adequate funding levels, and adequacy explains far more outcome variation than relative spending alone. Detailed case studies of large and midsized New York and New Jersey districts further show that between-district underfunding constrains the capacity of high-poverty districts to equalize resources across their own schools. We conclude that cost modeling is the more valid and policy-relevant method for evaluating equal educational opportunity, and that continued reliance on simpler comparability and progressiveness measures risks understating racial and economic disparities in school funding and misdirecting policy remedies.

Keywords: School Finance, Equity, Equal Opportunity, Cost

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Introduction

This article explores alternative approaches to measuring education spending or revenue when making comparisons regarding equity and fairness in school funding in research, policy and practice. Our analyses in this article focus primarily on evaluating racial disparities in school funding, both across and within local public school districts. We start with a broader discussion of traditional *spending* comparisons versus comparisons of *spending* that consider *costs of providing equal educational opportunity*. We assert that the latter is most often the preferred approach where sufficient data are available, but that the former can still provide useful information if conducted and interpreted appropriately. We also assert that both should be applied similarly when evaluating spending and cost variation across districts within states and across schools within districts.

Figure 1 provides an overview to the different approaches applied herein. Both have at their center, a measure of spending per child which should be a measure of the spending attributed to the programs and services that are provided to the relevant children.¹ On both the left and right hand side of Figure 1, we must consider factors that affect the value of each dollar per pupil with respect to the costs associated with achieving any set of outcome goals. That is, even our left hand side spending model importantly includes consideration of major cost drivers when making spending comparisons. Not all spending comparisons go even this far and we would suggest that those which don't are wholly insufficient. Input prices include variations from one labor market to another in the competitive wages needed to recruit and retain teachers and other school staff, as well as the prices of other inputs to schools (materials, supplies,

¹ that is, excluding spending provided for out of district services, for services provided to children in other schools not counted in the "per student" calculation, or for community services not delivered to the enrolled children.

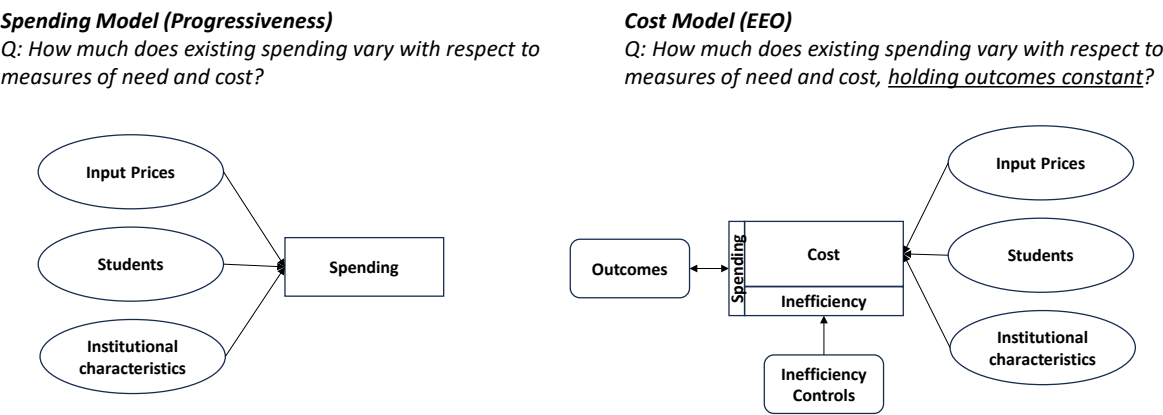
equipment, utilities, etc.). Within district comparisons generally do not require controlling for geographic variation in competitive wages, except, for example, in Hawaii (a single district with several geographically isolated labor markets). Student population characteristics typically include distributions of enrolled students by measures of language proficiency, disability classifications and family economic status. It is especially important in comparison across schools within districts to account for the distributions of children with disabilities across schools. Institutional characteristics may include measures of district or school size (economies of scale) and grade ranges served. More discussion is included in our methods section related to the specific models used herein. Appendix A provides a list of commonly used measures.

On the left hand side, we simply ask, how does spending vary with respect to these factors. We do have expectations for how spending *should* vary with respect to certain factors. We expect a positive sign on regional labor cost variation (higher spending supporting higher competitive wages), a negative sign on total enrollment (smaller institutions lacking economies of scale, thus having higher spending), and positive signs on concentrations of English Learners, children with disabilities, and children from low income families. Notably, this model tells us little or nothing about whether the magnitudes of differences are sufficient.

The model on the left can also be used to evaluate differences in spending with respect to some other measure of interest. For example, one might ask whether charter schools are commensurately funded with district schools. In doing so, one should compare charter and district schools a) facing similar labor cost pressures, b) serving similar students, and c) of similar scale and grade range (as an example) (Baker, Libby, & Wiley, 2015; Levin et al., 2016; Atchison, Levin, & de los Reyes, 2018). Comparisons of simple averages for charter vs district schools across an entire state would be insufficient and likely misleading.

But comparisons using the approach on the left, while better than some approaches, are still insufficient. It might be the case, for example, that schools serving high need populations on average spend less per pupil than those serving low need populations. That is, the coefficients on student factors are negative. We might be interested in exploring racial differences in spending using the approach on the left and we might find that districts or schools serving more Black children spend more, on average, than similar schools or districts having similar child poverty rates. But we may also find that schools with higher child poverty rates have lower per pupil spending, and that all schools serving larger shares of Black children have higher poverty rates. As such, the best our spending model approach can tell us is that high poverty schools which spend less on average may have marginally more funding where Black enrollment shares are larger. While limited, such information is still more complete than comparisons of simple averages in spending by school racial composition.

Figure 1. Spending Models vs. Cost Models



The missing piece in the left-hand side spending model, is consideration of the goals or expected outcomes for students given the dollars provided (Baker, Atchison & Levin, 2026; Duncombe & Yinger, 1999). It is the inclusion of outcomes in our model that allows us to

address not only the direction of relationships that should exist, but also the magnitude. One might think of the model on the left as useful for characterizing *what is* and the model on the right as more useful for characterizing *what should be*. Duncombe and Yinger (1999) explained that performance standards, or outcome goals are necessary for understanding costs, and Baker and colleagues (2026) have reinforced that understanding costs to achieve specific outcome goals is necessary for measuring the extent that education spending provides for equal educational opportunity. When we ask, “how much does spending vary with respect to measures of needs and costs, *holding outcomes constant*” we are, in effect, estimating the costs across settings and children to achieve a set of common outcomes. If we can estimate the costs across children and settings to achieve some set of common outcome goals, we then have benchmarks for *what should be*, not only in the direction that costs vary with respect to student characteristics, but also in their magnitude. Such benchmarking is critical to deeper understanding of school funding disparities across other dimensions (Atchison et al, 2023, 2024; Baker, 2025a & 2025b; Brooks et al. 2025).²

Conflicting Goals & Inconsistency across Reports, Studies and Policies

Policy reports and scholarly articles have adopted a variety of strategies for comparing spending between higher and lower poverty schools and districts and between Black, Hispanic and White students across schools and districts (Table 1). The realms of academic scholarship and policy reporting often favor presenting a novel strategy for evaluating a common problem

² A more comprehensive explanation of cost modeling methods is provided by Baker and colleagues (2026) and we provide some additional explanation in our methods herein. Most prior literature has applied cost modeling to school district level data within individual states, but in recent years, we have developed a national model of district level costs associated with achieving national average outcomes in reading and math and have successfully estimated school level models in multiple states. See Baker, Weber & Srikanth (2021) and Baker (2025a)

or issue. But we assert that common, established, rigorous methods are more useful for informing and affecting policy. Varied approaches can lead to substantively different conclusions, which in turn have vastly different policy implications, providing excuses for inaction. And the reality is that some approaches are simply more rigorous, more appropriate and lead to more valid and reliable findings.

Federal regulations for Title I funding under ESSA provide their own guidance for evaluating school spending differences between higher and lower poverty schools within the same district. The impetus for federal regulations on “comparability” of funding between those schools identified as “Title I” schools and those schools not identified as such is that the Federal Title I funding that flows through states, which distribute the funds to districts, and the districts to these schools requires that the funds are used to supplement, not supplant state and local funding. But these regulations, and the calculation bases for comparability are flawed. First, they apply only to differences between schools in the same district, when the largest gaps in funding in most states occur between not within districts. Second, most districts in most states do not have a mix of Title I and non-Title I schools. Rather, they have mostly (or entirely) one or the other.

Most other approaches used in policy reporting and scholarly publications also simply calculate whether children from low-income households, or disadvantaged minority groups have access to the same, less, or more resources per pupil, applying similar methods to compare across and within districts. Systems that provide districts with larger proportions of higher need or disadvantaged populations with more resources per pupil are considered “progressive” and those where higher need or disadvantaged populations have fewer resources are considered “regressive.”

Only some of those go to the extent of controlling for the factors we identify for a thorough spending model in Figure 1. Most take simpler averages on only the dimension of interest (poverty or race). A modified approach that considers “cost factors” involves dividing the revenue or spending amount by a regional wage adjustment, and calculating a weighted student enrollment count to address differences in costs associated with student needs – the weights assumed to correct for the magnitude of cost difference associated with each student population characteristic. The most rigorous approach for selecting these weights would be to rely on existing cost modeling research, as done by Bifulco and Souders (2024) in a study of school level racial disparities in funding.³ But weights from one context are not always equally applicable in another because there can be large cost differences. Estimating context specific cost models is preferable.

Table 1.

Method Class	Source / Method	Between Districts	Between Schools
Simple Averages	“Comparability” (Federal Title I Regulations)		state and local funds spent per student at Title I schools are equal to or greater than those at non-Title I schools
	Funding Gap ^[1]	Difference in funding between top and bottom quartiles by poverty or race	
	Progressiveness: Group or Weighted Averages ^[2]	Average revenues or spending for different student groups (enrollment weighted calculation)	
Spending Model (conditional averages)	Progressiveness: Regression Slopes ^[3]	Relationship (slope) between student population measure of interest and revenue or spending, controlling for other major “cost” factors.	
Cost Model (conditional on outcomes)	Cost Adjusted (outcome-based) Equal Educational Opportunity	National (District Level) Education Cost Model ^[4]	State Specific (School Level) Cost Models ^[5]

[1] Education Trust: <https://edtrust.org/wp-content/uploads/2014/09/Technical-Appendix-Equal-Is-Not-Good-Enough-December-2022.pdf> & Carey (2004)

[2] Urban Institute: https://apps.urban.org/features/school-funding-trends/files/202204_K12_funding_technical_appendix.pdf

[3] Baker, Sciarra & Farrie (2010)

[2] Baker, Weber & Srikanth (2021) and schoolfinancedata.org

³ They note “For free and reduced-price lunch–eligible students, the low, medium, and high weights are 0.33, 0.50, and 1.25, respectively. For ELLs, the weight is set to 0.10 for the low-weight case, 0.16 for the medium-weight case, and 0.92 for the high-weight case.” (Bifulco & Souders, 2024)

[5] Atchison et al. (2023, 2024), Baker (2025a, 2025b), Brooks et al. (2025)

Also missed when making only relative comparisons between districts within states or between schools within districts, are the ways in which the overall level of revenues may constrain the allocation – hence variation – in resources (Baker, 2012; Baker & Weber, 2016). We provide more discussion of this particular issue in our findings.

Illustrations: Why Cost Matters

Figure 2 – left panel – compares nominal per pupil spending by U.S. Census Poverty rates for all school districts nationally. Per pupil spending is measured as a ratio of each school district’s spending to the average spending for all other districts in the same labor market (metropolitan or micropolitan core based statistical area or rural area outside of CBSA, within each state). A district with a spending ratio of 1.0 would be spending at the average of those districts around it. This approach compares districts subject to similar input prices. What we see here is that on average, districts with higher rates of child poverty tend to have higher per pupil spending. In fact, moving from 0% to 100% child poverty would be associated with .62 increase in per pupil spending (from average to 62% above average). More realistically, within the actual range of data, the highest poverty district would be expected to have about 31% higher relative spending than the lowest poverty district, in 2023, weighted for district enrollment. That sounds rather progressive. But, is it progressive enough? To provide equal opportunity? Similarly, as we can see in Figure 2 – left panel – districts that serve majority black student enrollments tend to be above the “average” line, while also being generally high in child poverty rate. Measured this way, a district that is 100% black would be expected to have about 25% higher relative spending. Again, progressive.

Figure 2 – right panel – shows what happens when we measure current spending with respect to the cost of achieving national average outcomes in reading and math, based on our National Education Cost Model (more details to follow). Despite the uphill (progressive) slope in the left panel, we see a regressive slope with respect to poverty in the right panel. If the slope in left panel was steep enough – progressive enough – the right panel would have all districts falling along the horizontal line. The right panel captures both adequacy and equal opportunity. Adequacy – measured as a low bar of national average outcomes in reading and math, is captured in the dashed horizontal line. Many low poverty (left) districts spend well above what would be needed to achieve merely “adequate” outcomes measured by this low bar. Meanwhile, most high poverty districts and nearly all majority black districts fall below spending needed to achieve “adequate” outcomes. The distance of each district to the horizontal line, or ratio to it, measures equal educational opportunity.

Figure 2

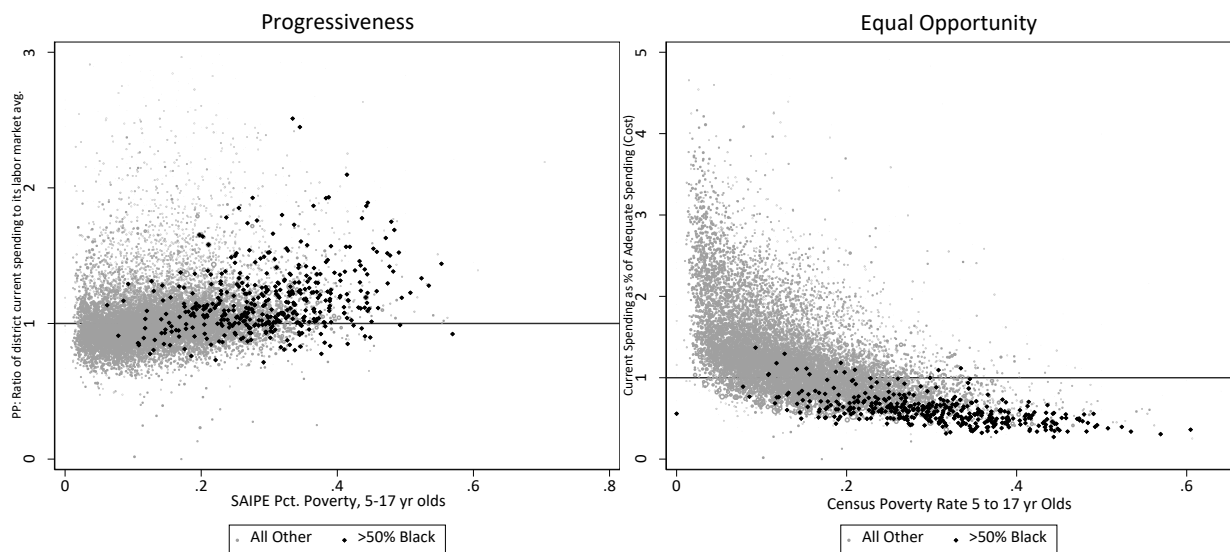


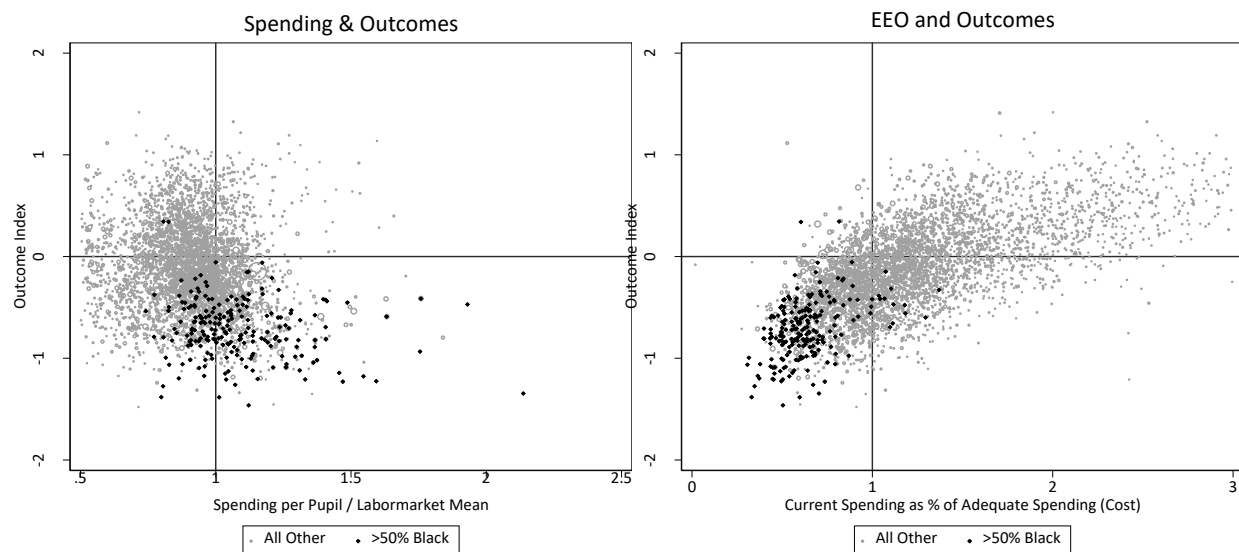
Figure 3 shows why this reframing is so important. It is important that we understand the outcome implications of inadequate funding. That the goal of a well-designed funding formula is to ensure that all children have resources adequate to achieve a common set of educational outcomes. State school accountability systems are premised on as much – that all children are expected to achieve “X.” And that school and district officials shall be subject to penalties if or when they do not. That is, even if the state has not calibrated the school funding formula to provide equal opportunity to do so.

Figure 3 – left panel – shows that if we look just at relative spending and student outcomes, higher spending districts have lower outcomes, with majority black districts having relatively higher spending but particularly low outcomes (combined, normed index of reading and math achievement). The opposite is true when comparing the adequacy of spending to outcomes – more adequate spending leads to higher outcomes, consistent with the research on how and why money matters. Additionally, the adequacy of district spending explains nearly 40% of outcome variation, whereas relative spending alone explains about 5%, but in the “wrong” direction. Spending adequacy is simply the better, more correct (more valid⁴) measure for comparing access to fiscal resources across children and setting. These are the same data used above, also for 2023. Collectively what Figures 2 and 3 tell us is that while spending on average is “progressive” it is far from “progressive enough,” leaving large gaps in equal educational opportunity, including significant racial gaps. In the most recent national report, we found:

⁴ Valid in the sense that the measure has predictive validity – can predict the outcome measures of interest (with the correct sign, sufficient magnitude and variance explained) – which, in this case are measured student outcomes in reading and math. See also: Baker (2006)

“African American students are twice as likely as white students to be in districts with funding below estimated adequate levels, and three times more likely to be in chronically underfunded districts. The discrepancies between Hispanic and white students, as well as those between Native American and white students, are also substantial.”⁵

Figure 3. Money and Outcomes



Notes on the Within vs. Between District Problem

Most racial and economic segregation occurs between local public school districts, not within them – so it can be difficult to identify and evaluate disparities across schools within districts.⁶ Not many districts, except for a handful of very large ones, have schools serving a wide range of racial or socioeconomic composition. More simply, in many states, not many school districts have large numbers of schools at all – across which measurable inequities might occur or be measured (10 or more schools). For example, in a 2016 paper, we found that in New

⁵ <https://www.schoolfinancedata.org/the-adequacy-and-fairness-of-state-school-finance-systems-2026/>

⁶ https://edopportunity.org/papers/Trends-in-Racial-Ethnic-Segregation_Rnd6.pdf

Jersey, about 1/3 of children attended districts with at least 10 elementary schools and in New York, while just over 50% do, most of those (36%) are in New York City alone. In Florida, that level rises to 98% (in districts with at least 10 schools), but few states are this high (Baker & Weber, 2016). Bifulco and Souders, in their evaluation of school level racial disparities in spending, also explain “In the Northeast, for instance, 91% of the Black–White gap and 97% of the Hispanic–White gap are due to differences across districts. In contrast, in the South and West, where there are many countywide school districts, within-district differences play a larger role than in the Northeast and Midwest.” (Bifulco & Souders, 2024, p. 11)

Between-district disparities occur because of failures of state aid programs to sufficiently offset differences in local capacity to raise revenues and differences in costs of meeting student needs. Between school disparities exist in this context, and are constrained by it. Local boards of education may face significant constraints on the extent to which they can mitigate disparities across schools within districts, but should be expected to do so to the extent they can.

Schools within districts may not only be vastly racially and economically different from those in their surroundings, but may also have systematically lower cost adjusted (or even nominal) spending per pupil. Two prior papers discuss this problem (Baker & Weber, 2016; Baker, 2012). Schools and districts in a metropolitan area may serve the full range of student needs, but within a specific high need district, schools may vary only from very high, to the highest needs. At the same time, high poverty schools or districts may have less adequate funding. This can make it quite difficult for resource allocations decisions made in a high poverty district to have much effect on equity and equal opportunity across schools within the district. Overall, there’s not enough funding to go around, and the schools range from high need

to very high need. Meanwhile, sometimes immediately across a given street serving as a district boundary, are schools with much lower need populations and far more resources.

Of course, there are still many disturbing examples of large districts that have large resource differences between schools within their boundaries. For example, in the report *Green Still Follows White: A National Report on Inequitable Within-District Spending*, based on data from 2018-19, using the limited simpler analysis of per-pupil spending, still found that over 41% of Black and Native American Indian students and over 53% of Latinx students attended schools where a regressive within district spending pattern was identified.⁷ Further, 44% of school districts that reported they were still under desegregation orders or agreements were found to have within-district regressive spending on Black students based on school demographics.⁸ Although the *Green Still Follows White* report did not consider between district differences, nor did they have a model to compare funding levels to any estimate of the cost of providing adequacy. Yet, they still found 2.5% of Black students attended a school where the within district spending pattern showed that per-pupil expenditures were 10% *or more below* the district's average.⁹ Importantly, findings like these, despite their acknowledged limitations, might be useful to local advocates confronted with blatantly inequitable spending. That said, it is critically important to look more deeply at the costs of adequacy and the between district differences. A deeper understanding of these differences, and increasing our capacity to recognize inequity, are both essential if we ever intend to pursue effective remedies.

⁷ See Sarah LaCour, Bruce Easop and Dan Losen, pgs 13, National Center for Youth Law, 2024. Available online at <https://youthlaw.org/resources/green-still-follows-white/>

⁸ Id at 18.

⁹ Id at 13. It should be noted that the researchers acknowledged that between district inequities were not considered, and that their chosen method used to highlight within district inequity failed to sufficiently capture the degree of inequity that students experience, and that even many of the districts they labeled “progressive” could be inequitable within if the cost of meeting the needs were considered. Id at 12-13.

Research Questions

The analyses that follow, using national, district level data from the School Finance Indicators Database and National Education Cost Model, and school level data from select states on which we have collaborated in cost modeling studies, we address the following three questions:

1. Using national, district level data, how do racial disparities in spending differ when comparing nominal spending to spending adequacy, adjusted for costs of achieving common outcomes?
2. Using school level data for select states how do racial disparities in spending differ when comparing nominal spending to spending adequacy, adjusted for costs of achieving common outcomes?
3. Within select large and mid-sized districts in New York and New Jersey, how do racial disparities in spending differ when comparing nominal spending to spending adequacy, adjusted for costs of achieving common outcomes?

Data & Methods

National, district level data are drawn from the district level panel of the School Finance Indicators Database (SFID) and from our own updated estimates of the National Education Cost Model (NECM), where a version of the data is available for download as the District Cost Database (DCD) at [Schoolfinancedata.org](https://schoolfinancedata.org). District cost estimates provided in the DCD are constructed using a cost modeling approach with a long history in academic literature.¹⁰ We

¹⁰ For a thorough review of that literature and history, see: Baker, Atchison & Levin (2026). For more detail on the most recent National Education Cost Model, see (Baker, 2025a)

focus on data from 2018 forward (to 2023) to align our time period with the data from our state specific, school level models.

School level, state specific cost models are fully documented in the reports cited herein. These models are estimated using data available through state agencies on school level expenditures and student characteristics. In some cases (as documented in the related reports), other data sources, including from SFID/NECM are used to supplement state data. Appendix B provides detailed estimates for the cost models from New York and New Jersey, which we use for further exploration herein. When aggregated to the district level, the findings of our school level cost models – the per pupil cost predictions to achieve a common outcome goal – are highly correlated with the district level cost predictions from the NECM.

Table 2. Correlations between state model and national model cost predictions

State	Correlation with NECM (2022)
Colorado	.941
Delaware	.917
New Jersey	.803
New York	.877
Oregon	.802

Data in the state models are mostly state sourced measures, which in some cases differ significantly from the supposed same measure in federal data. Additionally, while the NECM includes only harmonized measures of reading and math scores, grades 3 to 8, the state level models include outcome factor indices based on a wider array of outcome measures (see appendix A).

To address the research questions laid out above, we provide both simple, bivariate visual characterizations relating student population characteristics and spending measures, and

regression analyses controlling for a) other population characteristics, and b) institutional characteristics, like grade ranges served. Our dependent measures of interest are:

School or District Spending per Pupil:

Option 1: Nominal spending per pupil

Option 2: Spending per pupil as a ratio to the average spending per pupil of all districts in the same labor market.

Spending Adequacy: Current spending as a ratio to the predicted spending needed to achieve a common outcome goal.

Findings: Racial & Economic Disparities in Spending & Adequacy

Here, we review our findings on racial and economic disparities in school funding:

1. Across public school districts (local education agencies) nationally (within and between states, and for select states), applying the National Education Cost Model (NECM);
2. Across local public schools in 5 states (New York, New Jersey, Oregon, Colorado and Delaware), including cost adjustments from recent cost modeling studies conducted in these states.

Figure 4 shows the slope of the relationship between:

1. Per pupil spending as a ratio to labor market (metro area) average spending, with respect to a) child poverty, b) black enrollment share, and c) Hispanic enrollment share;
2. Per pupil spending as a percent of adequate spending (to achieve national mean outcomes), with respect to a) child poverty, b) black enrollment share, and c) Hispanic enrollment share.

As shown in Figure 4, in the top 3 panels, (4a-4c), the relationship between relative spending and poverty is positive – that is, the overall pattern is progressive. A district that has 0% children from families in poverty is expected to have 90% of labor market average spending and a district that has 60% children from families in poverty is expected to spend 30% above labor market averages. The range of difference is much smaller by race (.95 to 1.1 for Black, .98 to <1.01 for Hispanic, from 0% to 60%). Contrary to the top panels, figure 4's bottom panels(4d-4e) one can see that when the cost of adequacy was considered, what had looked like progressive spending is revealed to be regressive across the board. Specifically, wealthier districts serving 0% children from families in poverty spent 50% *above* the cost of achieving adequate outcomes. In stark contrast, those districts serving 60% children from families in poverty spent only half of what they'd needed to spend to achieve national average outcomes. Black and Hispanic populations appear to have been similarly shortchanged once their spending was compared to the cost of adequacy.

Figure 4. District Nominal vs. Cost Adjusted “Progressiveness” with respect to Poverty & Race

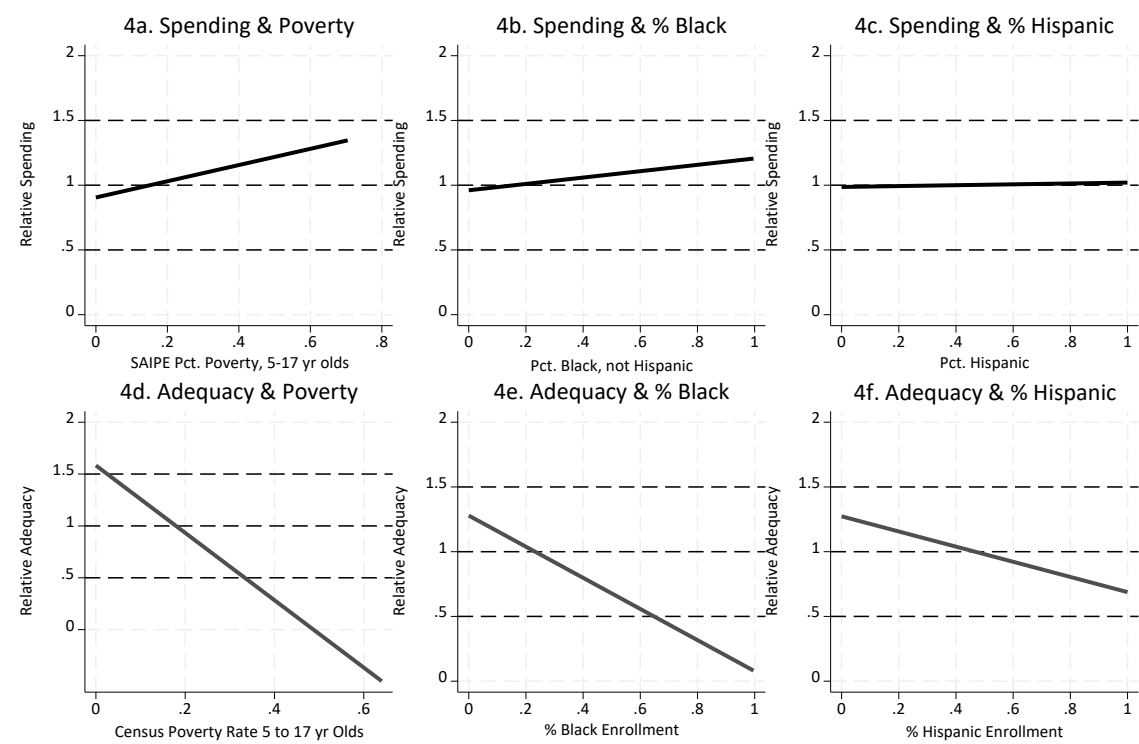


Table 3 shows findings from several regression models in which we control for district size, regional labor cost variation and other student population characteristics (Poverty, English Learners, Disability share). Complete regression results are in Appendix B. National, district level models include data from 2018 to 2023, and state level models include data between 2018 and 2024 (with some panels ending at 2023). “Race Only” models exclude child poverty (or neighborhood poverty in school model) and share of English Learners, as these measures are correlated with racial composition. Running models, with and without these measures, paint a more thorough picture of the disparities.

In addition, two additional models were run: a) national district level models with and without state fixed effects; and b) state level school models, with and without district fixed effects. The national model without fixed effects characterizes the average differences in

spending across all school districts, nationally, without regard to state borders. The fixed effect model is capturing the differences in spending, by race, across districts within each state – averaged across all states.

In the first column – Spending per Pupil, Race Only – we can see, consistent with our figures above, that on average, districts with larger shares of Black or Hispanic students tend to have higher per pupil spending than districts with lower shares of Black and Hispanic students when using national district level data, across all states (for % Hispanic, not statistically significant). Moving from 0% to 100% Black enrollment leads to just over \$1,000 additional dollars per pupil, controlling for year, district size and disability share. Within states (fixed effect), on average, a district with 100% Black enrollment is expected to have \$3,000 higher spending per pupil.

Controlling for child poverty and English learner shares, in the model without fixed effects, we see that Hispanic enrollment share is negatively associated with per pupil spending, in large part because states with large Hispanic enrollment shares tend to have low spending school districts. This difference is washed away when we compare districts only to those within their state – and take the average of those differences across states (fixed effect model). In other words, in some cases the observed inequity reflects more about differences in each state’s total funding commitment to support public education than it reflects an inequity in the state’s distribution of the committed funds to the districts within

State models reveal some different patterns than the national overall picture. On nominal spending both within and across districts, New Jersey school spending is consistently higher in schools with larger shares of Black or Hispanic students. Notably, however, a relatively small share of New Jersey students attends racially diverse school districts which have more than a

few schools. Funding is more progressive (values larger) across schools within districts than across schools statewide, when controlling for poverty.

New York State and New York City, however, are another story. Nominally, without controlling for child poverty and English learners, schools with larger Black and Hispanic enrollment shares spend less per pupil. These differences are mitigated when controlling for poverty, but as in other states and nationally, poverty and race are highly correlated in New York. Research has well established that due to both the legacy and continuation of racial and ethnic discrimination, which contribute to current and generational wealth differences, race and poverty are often inextricably linked, and should not be regarded as truly independent or neutral variables. Therefore, we argue that the analyses provided showing racialized patterns of inequitable spending before controlling for poverty deserve the full attention of policymakers. However, it is especially noteworthy if differences are still found for any group of students of color, after controlling for poverty.

In this analysis, even after controlling for poverty and other factors, we found that schools within districts having larger Hispanic enrollment shares spent less than peer schools within the same district. This disparity is particularly pronounced in New York City.

Table 3. Regression results for racial disparities

			Spending per Pupil		Spending Adequacy	
			Race Only	Race, Poverty & ELL	Race Only	Race, Poverty & ELL
National, District Level						
	Dollars per Pupil	%Black	1,018.846*	-749.037	-1.442*	-0.977*
		% Hispanic	92.309	-1,696.438*	-0.945*	-0.403*
		% Census Poverty		3,931.342*		-1.598*
		% ELL		-636.588		-0.792*
	State Fixed Effects	%Black	3,156.121*	1,665.626*	-0.774*	-0.246*
		% Hispanic	2,523.121*	627.814	-1.211*	-0.730*
		% Census Poverty		5,444.270*		-1.700*
		% ELL		3,494.646*		-0.583*
5* State, School Level						
	State Fixed Effects	%Black	2,278.121*	4,464.993*	-0.381*	-0.251*
		% Hispanic	2,039.503*	978.892*	-0.360*	-0.166*
		Neighborhood IPR		6.685*		0.000*
		% ELL		6,173.339*		-0.204*
	District Fixed Effects	%Black	7,121.786*	7,476.969*	-0.371*	-0.377*
		% Hispanic	3,608.132*	1,662.472*	-0.428*	-0.322*
		Neighborhood IPR		1.566*		0.000*
		% ELL		3,389.676*		-0.240*
New Jersey						
	Dollars per Pupil	%Black	5,061.486*	5,794.796*	-0.556*	-0.393*
		% Hispanic	3,210.312*	2,017.582*	-0.434*	-0.218*
		% Free Lunch		-1,125.972*		-0.241*
		% Multilingual		6,983.131*		-0.113*
	District Fixed Effects	%Black	5,593.310*	7,569.720*	-0.436*	-0.317*
		% Hispanic	1,511.393*	3,445.768*	-0.404*	-0.108*
		% Free Lunch		-3,341.833*		-0.351*
		% Multilingual		799.243		-0.346*
New York						
	Dollars per Pupil	%Black	- 1,899.214*	6,663.182*	-0.508*	-0.153*
		% Hispanic	- 1,617.632*	767.501	-0.522*	-0.095*
		% Econ Disadv		-12,874.606*		-0.568*
		% ELL		19,842.721*		-0.062*
	District Fixed Effects	%Black	1,024.308	4,100.770*	-0.324*	-0.246*
		% Hispanic	-939.991	-3,867.354*	-0.348*	-0.173*
		% Econ Disadv		-2,732.343*		-0.252*
		% ELL		17,412.610*		-0.167*
New York City						
	Dollars per Pupil	%Black	-29.897	1,867.873*	-0.641*	-0.767*
		% Hispanic	-1,413.461	-5,390.100*	-0.607*	-0.487*
		% Econ Disadv		195.797		-0.258
		% ELL		16,560.421*		-0.631*

*New York, New Jersey, Delaware, Colorado, Oregon

Select NY & NJ Cities: School Level Data

Here, we take a deeper dive into a handful of school districts in New York and New Jersey. We start with Figures 5 which presents the relative progressiveness/regressiveness of nominal spending per pupil and spending adequacy in each city. As with our state and national graphs earlier we can see that nominal spending is generally flat to progressive and spending adequacy is generally regressive. There are a few key features here that are particularly relevant to evaluating within district disparities. First, in many cities, the range of population differences is relatively small, as shown by the length of the lines. Note that only New York City's trendlines span the full range of economic disadvantage. Buffalo, NY and Jersey City, NJ are also relatively diverse, but other district's schools range from high to very high rates of economic disadvantage. The case is similar by race. Some districts have very narrow ranges of variation across schools in the share of enrollments that are Black or Hispanic, like Newburgh which has few Black and mostly Hispanic students.

The other important features appear in the bottom half of the figure where we are comparing spending adequacy by population characteristics. The horizontal dashed lines represent spending needed for students to have equal opportunity to achieve state average outcomes. New York City has schools with spending levels both above and below this line, and Jersey City, NJ has schools mostly above that line. Both have regressive spending distributions with respect to economic disadvantage or race. If New York City were to correct those disparities, it would achieve a level – horizontal line that is marginally below the adequacy line. If Jersey City were to correct those disparities, and have a progressive enough spending distribution to provide equal opportunity, it would have a horizontal line that is still above the

dashed “adequacy” (for average outcomes) line. This would require, in each case, substantially more progressive distribution of spending across schools within the district.

Other districts like Syracuse and Rochester face more significant problems. Their entire distribution of spending across schools falls well below the adequacy threshold to achieve average outcomes. And, the range of economic disadvantage across schools is from high to very high and mostly Black or Hispanic.

Figure 8

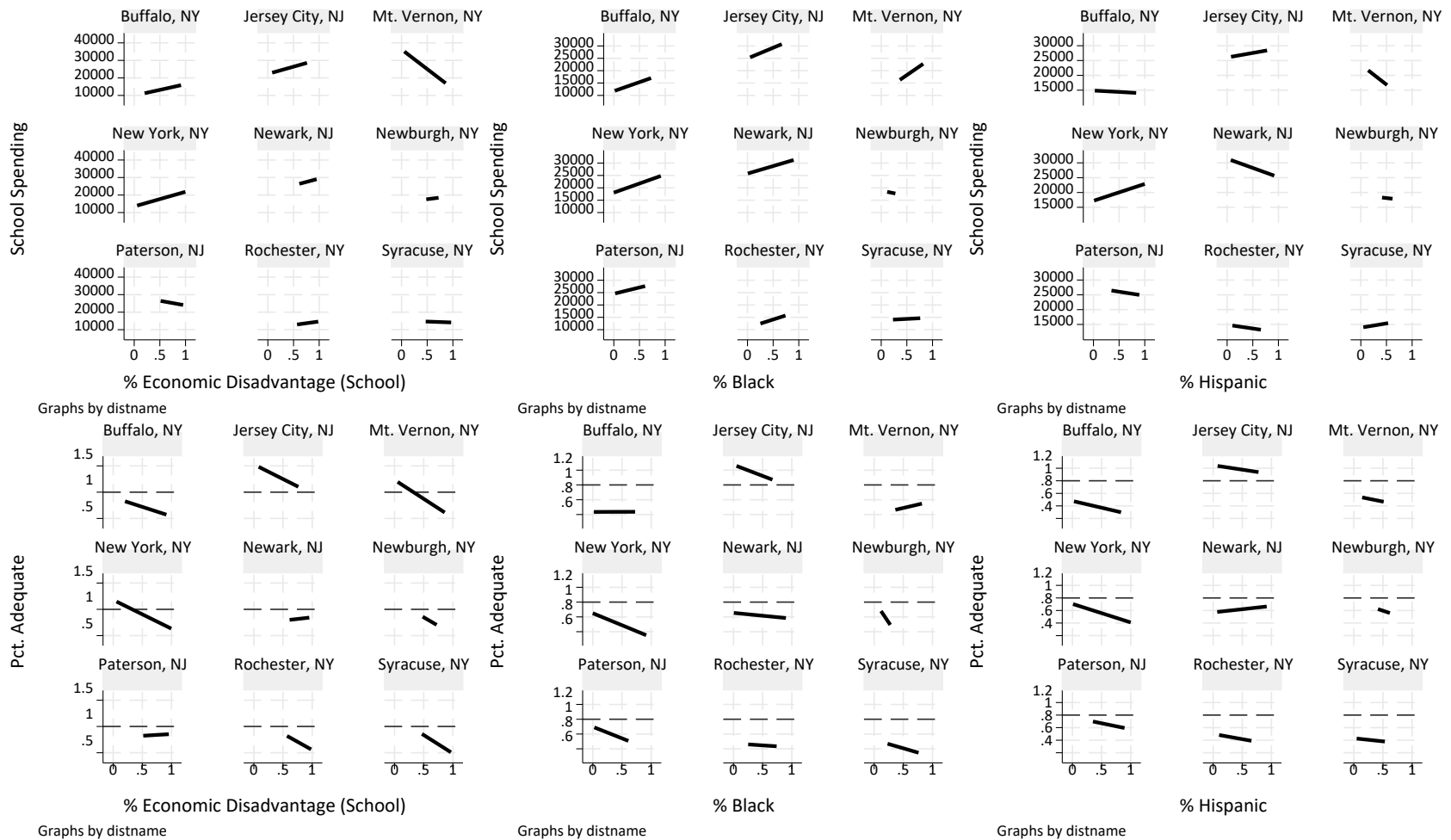


Table 4 summarizes the distributions of enrollments by adequacy category. In Buffalo, Mt. Vernon, Newark, Newburgh, Paterson, Rochester and Syracuse, NY nearly all students attend schools with less than 80% adequate funding to achieve state average outcomes. Only small handfuls of children in each of these districts attend schools with spending 20% above adequacy, and none in Newburgh or Syracuse. Notably, if evaluating equity depended primarily on looking at the within district scenario those in which resources were equally distributed, (whether all were adequate, above adequate or inadequate) across all schools within a district would be regarded as attending a district where resources were equitably distributed. Yet, in districts like these, most of the students experience an inequitable opportunity to learn. This is why including cross district and even cross state comparisons to reasonable cost estimates of adequacy are vitally important. In districts like these, where nearly all children are subject to less than 80% adequacy, the state is responsible for the systemic failure, not the individual district/LEAs. This also means that the state's accountability system, which focuses on school and district performance, but excludes its own roll lets the entity most responsible off the hook. The extent to which the observed inequities are found between districts is of vital importance for those seeking remedies, whether through legislative, or legal recourse.

**Table 4. Distribution of students across schools within districts by spending adequacy
(Average 2019-2023)**

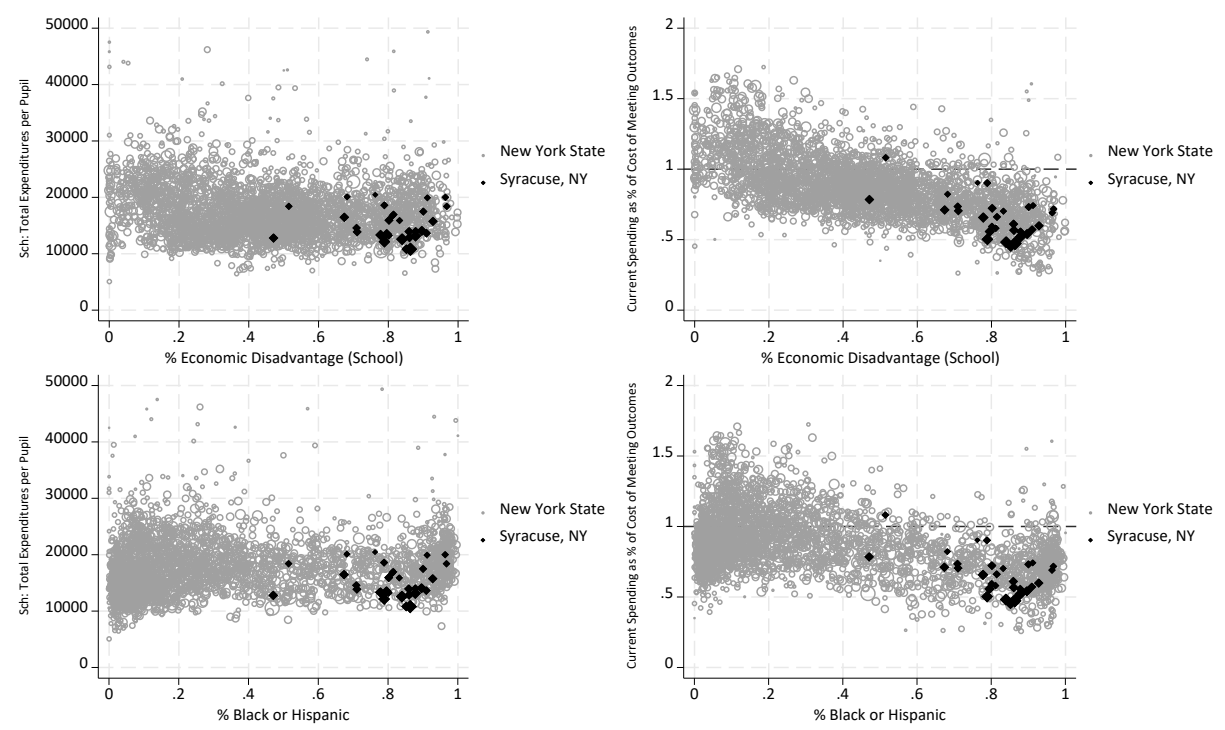
		Less than 80%		>80% & <120%		More than 120%	
		Number	Percent	Number	Percent	Number	Percent
Buffalo, NY							
	Total	27,258	88%	3,468	11%	312	1%
	Black	11,617	90%	1,141	9%	191	1%
	Hispanic	5,572	91%	481	8%	44	1%
Jersey City, NJ							
	Total	3,044	11%	18,240	67%	5,763	21%
	Black	1,016	15%	4,911	71%	977	14%
	Hispanic	1,346	13%	7,023	68%	2,027	20%
Mt. Vernon, NY							
	Total	6,008	81%	1,214	16%	167	2%
	Black	3,884	82%	735	15%	134	3%
	Hispanic	1,517	81%	326	17%	32	2%
New York, NY							
	Total	630,935	73%	227,255	26%	5,813	1%
	Black	152,415	88%	20,097	12%	474	0%
	Hispanic	289,178	83%	56,588	16%	1,083	0%
Newark, NJ							
	Total	13,105	35%	23,085	62%	952	3%
	Black	5,835	41%	7,734	55%	582	4%
	Hispanic	6,322	32%	13,049	66%	331	2%
Newburgh, NY							
	Total	6,376	58%	4,560	42%		0%
	Black	1,339	59%	933	41%		0%
	Hispanic	3,547	60%	2,356	40%		0%
Paterson, NJ							
	Total	13,824	60%	9,239	40%	143	1%
	Black	3,230	69%	1,408	30%	35	1%
	Hispanic	9,785	61%	6,031	38%	103	1%
Rochester, NY							
	Total	19,965	85%	2,818	12%	834	4%
	Black	10,119	85%	1,398	12%	443	4%
	Hispanic	6,338	87%	650	9%	295	4%
Syracuse, NY							
	Total	17,734	93%	1,289	7%		0%
	Black	8,178	94%	492	6%		0%
	Hispanic	2,464	96%	113	4%		0%

Figure 9 explores this issue further using Syracuse, NY as an example, with school level spending per pupil (nominal) on the left and adequacy of spending per pupil on the right. The top panels show schools by rates of children from low-income families (economic disadvantage in NYSED data) and the bottom panels by % Black or Hispanic. While schools across the state,

excluding New York City, range from 0 to 100% economic disadvantage, Syracuse schools mostly fall above 60% economic disadvantage, and >60% Black or Hispanic.

Compared to schools with similar student populations, Syracuse schools spend less per pupil (close to bottom of the distribution). When represented as a % of adequate funding, most Syracuse schools spend only about half of what they'd need to achieve state average outcomes on our comprehensive outcome index (including language arts & math achievement, graduation rates and regents diploma rates). Needless to say, it would be difficult for Syracuse to make much progress toward improving equal educational opportunity across schools within the district without New York State first improving the level of funding for Syracuse.

Figure 9. Disparities across districts & within Syracuse in New York State



Conclusions & Implications

We have illustrated here that:

- Cost modeling methods are increasingly consistent and robust for measuring cost variation at both the district and school level and predicting levels of spending associated with outcome goals;
- Cost modeling provides deeper insights into the provision of equal educational opportunity because cost models provide estimates of the magnitude of cost difference associated with achieving common outcome goals across varied student population, school and district dimensions;
- Cost modeling provides useful insights for evaluating both within district and between district disparities in spending, including how between district disparities in funding and relative adequacy may constrain within district re-allocation;
- Less thorough and less rigorous methods may be useful in some contexts, especially where they expose the most blatant inequities. However, they often provide misleading findings, which may completely mask serious inequities. The great risk of these misunderstandings is that much of the inequity that students experience is overlooked, and where it is noticed, the incomplete understanding can contribute to counter-productive policies, or ineffective remedies that frustrate public educators and shortchange our children and our future.

Consistent findings and conclusions are necessary for informing policy at the federal, state or local level. Such findings should be drawn from the most rigorous and appropriate empirical

methods. When it comes to evaluating a) how much school funding is needed to achieve a particular set of goals or b) how much more or less should be provided in some settings than others, for some children versus others, to have equal opportunity to achieve those goals, education cost modeling is the most rigorous and appropriate method. While political debate often favors simplicity over rigor, simplicity cannot be accepted where findings are insufficient, invalid or inaccurate. Mixed findings lend confusion to political discourse, providing cover for inaction. Some methods are more valid than others for addressing specific questions pertaining to school funding equity and adequacy. As we show herein, simpler measures often lead to incomplete information at best (direction but not magnitude), and misinformation at worst (wrong direction and magnitude). As such, more rigorous methods presented herein should be the primary methods for evaluating the equity and adequacy of school funding both across and within districts and should play a greater role in informing a) state school finance policies, b) federal regulations regarding within district distribution of funding, and c) potentially, federal allocation of Title I funding across states and districts, nationally.

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Appendix A. Cost Model Parameters

Table A1. Student Need and Context Measures Used in Recent & Ongoing Studies

Student Needs		Context		
Individual	Collective	Institutional / Structural	Geographic Location	Input Prices
English Learners By WIDA ^[1] Disability By Severity ^[2]	Child Poverty ^[3] SAIPE NSLP (FRL) Direct Cert Predicted Index IPR Racial Isolation ^[5] Homelessness Migrant Students	Grade Range Distributions % in 6 to 8 % in 9 to 12 Institution Size/Scale Enrollment groups (up to 2,000)	Population (or enrollment) Sparsity	Regional Comparable Wage Index for Teachers ^[4]

[1] WIDA refers to the Access for ELLS standards which identify language proficiency at multiple levels and have been adopted by several states. Data reporting remains too sparse for use, as of yet, in our models (<https://wida.wisc.edu/assess/access>)

[2] LD/BD/OHI vs. Other, or state-defined severity categories.

[3] Residential location measures include Census Small Area Income and Poverty Estimates (SAIPE) <https://www.census.gov/programs-surveys/saie/data/datasets.html> & the Neighborhood Poverty Index, or Income to Poverty Ratio <https://nces.ed.gov/programs/edge/Economic/NeighborhoodPoverty>.

[4] Comparable Wage Index for Teachers <https://nces.ed.gov/programs/edge/Economic/TeacherWage>

[5] see Baker, 2025c

Table A2. Outcomes, Spending & Efficiency Measures used in Recent & Ongoing Studies

	Outcomes	Instruments	Spending Measures	Efficiency Measures
Elementary & Secondary	Outcome Factor Score (OFS) ^[1] ELA & Math Assessments Absenteeism Cohort Graduation Adv. Diplomas Dropout Rates	Neighbor ^[2] Outcomes Assessments OFS Neighbor Demographics Income/Poverty Ratio Racial Composition Education Levels (% BA or higher)	Annual Operating Expenditures per Pupil Excluding Debt (principle & interest) & tuition transfers	Fiscal Capacity Relative Income Taxable Wealth Public Monitoring % School Aged % over 65 % intergov aid % Residential Value Competition Density Herfindahl Index Charter/Private Mkt Share

[1] Weighted factor score generated via structural equation modeling

[2] Neighbors have been defined in a few different ways. At the district level, we've used averages of all other districts in the same labor market (or metro area) space. At the school level, we've used measures of the nearest X (5 or 10) other schools outside of the observed district.

Table A3. New York Cost Model(s)

		School Level Model		District Level Model (1 NYC)		District Level Model (NYC Boroughs)	
		coef	se	coef	se	coef	se
Outcome Factor		0.221***	0.027	0.216**	0.085	0.164**	0.071
Student Characteristics							
	% Economic Disadvantage	0.104**	0.046				
	% Census Poverty			0.909***	0.257	0.794***	0.227
	% Black	0.465***	0.042	0.369***	0.132	0.271**	0.106
	% Hispanic	0.199***	0.029				
	% ELL	0.524***	0.043	0.065	0.186	0.207	0.182
	% Students with Disabilities	2.263***	0.101	1.020***	0.269	1.065***	0.240
	% Homeless	0.906***	0.086	1.582***	0.451	1.311***	0.405
	% in Foster Care	6.789***	0.578	3.779**	1.673	3.421**	1.541
District & School Structural Characteristics & Location							
	Grade Range Distribution						
	% in Pre-k through 5	-0.002	0.008				
	% in Grades 6 to 8	-0.001	0.010	-0.147	0.293	0.593*	0.318
	% in Grades 9 to 12			0.682***	0.123	0.170	0.119
	Population Density (ln)	-0.035***	0.004	-0.034***	0.008	-0.024***	0.007
	School/District Enrollment						
	School Enrollment<300	0.134***	0.008				
	District Enrollment 600 to 2000	0.074***	0.010	0.054***	0.015	0.064***	0.015
	District Enrollment 300 to 600	0.109***	0.023	0.079***	0.025	0.116***	0.026
	District Enrollment <300	0.301***	0.034	0.202***	0.038	0.278***	0.039
	Comparable Wage Index for Teachers	0.741***	0.086	1.101***	0.107	0.985***	0.104
	Charter School	-0.039*	0.023				
Time (t0 = 2019)		0.040***	0.001	0.040***	0.001	0.041***	0.002
Efficiency Measures							
	% Population between 5 & 17	-0.955***	0.153	-0.646	0.488	-1.113***	0.352
	Herfindahl Index	-0.623**	0.309	-0.640	0.467	-0.534	0.485
	Household Income Ratio to Surroundings	0.007	0.022	-0.143**	0.062	-0.097*	0.050
	Taxable Assessed Value per Pupil (ln)			0.090***	0.015	0.101***	0.014
	Municipal Fiscal Dependent						
Constant		9.408***	0.039	8.291***	0.203	8.109***	0.205
	Number of observations	22,696		3,225		3,878	
		0.338		0.542		0.565	
Partial F		111.75		15.57		22.86	
p-value of Hansen J		0.9218		0.2464		0.0153	
note: *** p<0.01, ** p<0.05, * p<0.1							

Table A4. New Jersey Cost Model

DV=(ln) spending per pupil		Coefficient	r.s.e	P>t
Outcome Factor		0.188	0.025	*
Student Population				
	% Free Lunch	0.267	0.048	*
	% Black	0.481	0.055	*
	% Hispanic	0.185	0.039	*
	% ELL	0.444	0.057	*
	% SWD	2.019	0.200	*
Grade Distribution				
	% Ungraded	0.302	0.113	*
	% Grades 6 to 8	0.083	0.012	*
	% Grades 9 to 12	0.207	0.016	*
School / District Size				
	School <100 Pupils	0.099	0.069	
	School 101 to 300 Pupils	0.054	0.015	*
	School 301 to 600 Pupils	0.030	0.009	*
	District <500 Pupils	0.118	0.018	*
	District 501 to 1500 Pupils	0.066	0.011	*
	District 1501 to 2000 Pupils	0.047	0.015	*
Density <500 sqmile		0.082	0.013	*
	Herfindahl Index	-2.757	1.398	**
	Charter Share (District)	0.679	0.079	*
	Private School Share (District)	0.138	0.048	*
Comparable Wage Index (NJ Based)		-0.362	0.098	*
Time		0.044	0.001	*
Constant		9.933	0.090	*
	Hansen J p-value	0.199		
	Partial F (instruments)	75.170		
Number of obs		13,236		
Number of clusters (schid)		2,281		

*instruments include the average of the nearest (by linear distance) 5 schools % Hispanic population and Income to Poverty Ratio (Neighborhood Poverty Index)

Appendix B. Regression Models of Spending & Adequacy

Table B1. National Nominal Spending

	Poverty & ELL Only		Race Only		Race, Poverty & ELL	
<i>DV = Labor Market Centered per Pupil Spending</i>	coef	se	coef	se	coef	se
<i>Student Population</i>						
Pct. Hispanic			0.091***	0.012	-0.055***	0.017
Pct. Black, not Hispanic			0.225***	0.020	0.130***	0.015
Ratio of district pct. in poverty, 5-17 to labor market	0.082***	0.009			0.051***	0.008
Pct. ELL (LEP pre-2002)	0.091***	0.027			0.265***	0.038
Pct. Special Education	0.424***	0.063	0.675***	0.214	0.489***	0.057
<i>District Enrollment</i>						
Enrollment <100	0.656***	0.048	0.763***	0.045	0.674***	0.049
Enrollment 101 to 300	0.255***	0.015	0.318***	0.018	0.274***	0.015
Enrollment 301 to 600	0.113***	0.007	0.158***	0.010	0.130***	0.007
Enrollment 601 to 1200	0.039***	0.005	0.075***	0.007	0.053***	0.004
Enrollment 1201 to 1500	0.017***	0.006	0.053***	0.010	0.028***	0.006
Enrollment 1501 to 2000	0.011**	0.005	0.044***	0.009	0.021***	0.005
<i>Year</i>						
Year=2018						
Year=2019	-0.001	0.001	-0.002*	0.001	-0.001	0.001
Year=2020	-0.003	0.002	-0.004*	0.002	-0.002	0.002
Year=2021	-0.004**	0.002	-0.005*	0.003	-0.005**	0.002
Year=2022	-0.009***	0.003	-0.008**	0.004	-0.008**	0.004
Year=2023	-0.005*	0.003	-0.009**	0.004	-0.007***	0.003
<i>Constant</i>	0.839***	0.011	0.837***	0.030	0.837***	0.010
Number of observations	54,434		74,550		54,424	
R2	0.147		0.070		0.172	

note: *** p<0.01, ** p<0.05, * p<0.1

Table B2. National Spending Adequacy

	National Model						National Model with State Fixed Effects ("within" state)					
	Poverty & ELL Only		Race Only		Race, Poverty & ELL		Poverty & ELL Only		Race Only		Race, Poverty & ELL	
	coef	se	coef	se	coef	se	coef	se	coef	se	coef	se
<i>Student Population</i>												
% Hispanic Enrollment			-0.945***	0.033	-0.403***	0.041			-0.774***	0.032	-0.246***	0.033
% Black Enrollment			-1.442***	0.032	-0.977***	0.043			-1.211***	0.036	-0.730***	0.032
Census Poverty Rate 5 to 17 yr Olds	-3.086***	0.078			-1.598***	0.094	-2.668***	0.083			-1.700***	0.078
% ELL	-0.868***	0.068			-0.792***	0.085	-0.679***	0.056			-0.583***	0.063
% Students with Disabilities	2.151***	0.160	0.878***	0.286	1.467***	0.187	-2.721***	0.223	-3.714***	0.327	-2.953***	0.246
<i>District Enrollment</i>												
Less than 100 Students	0.202***	0.030	-0.012	0.029	0.055*	0.029	0.094***	0.026	-0.056**	0.026	0.018	0.025
101 to 300 Students	0.211***	0.016	0.038**	0.016	0.085***	0.015	0.070***	0.013	-0.057***	0.013	0.003	0.012
301 to 600 Students	0.161***	0.014	0.010	0.014	0.047***	0.014	-0.001	0.011	-0.109***	0.012	-0.062***	0.010
601 to 1200 Students	0.186***	0.013	0.049***	0.013	0.082***	0.012	0.001	0.009	-0.091***	0.009	-0.053***	0.008
1201 to 1500 Students	0.204***	0.017	0.073***	0.017	0.108***	0.016	0.026**	0.012	-0.063***	0.012	-0.025**	0.011
1501 to 2000 Students	0.191***	0.016	0.075***	0.016	0.103***	0.015	0.020*	0.010	-0.054***	0.011	-0.026***	0.010
<i>Education Comparable Wage Index</i>	0.331***	0.036	0.796***	0.044	0.592***	0.041	-0.322***	0.041	0.114**	0.048	-0.115**	0.046
<i>Year</i>												
Year=2018												
Year=2019	-0.044***	0.003	-0.022***	0.003	-0.034***	0.003	0.011***	0.003	0.028***	0.004	0.014***	0.003
Year=2020	-0.104***	0.004	-0.068***	0.005	-0.090***	0.004	-0.001	0.005	0.025***	0.007	0.002	0.006
Year=2021	-0.134***	0.005	-0.167***	0.007	-0.154***	0.005	0.033***	0.008	-0.003	0.010	0.010	0.009
Year=2022	-0.148***	0.010	-0.184***	0.015	-0.175***	0.011	0.085***	0.017	0.037*	0.022	0.051***	0.019
Year=2023	-0.195***	0.011	-0.269***	0.013	-0.240***	0.011	0.112***	0.016	0.033*	0.019	0.064***	0.017
<i>Constant</i>	0.821***	0.059	0.097	0.095	0.486***	0.077	3.090***	0.168	2.160***	0.173	2.679***	0.170
Number of observations	72,493		72,493		72,493		72,493		72,493		72,493	
R2	0.442		0.462		0.508		0.766		0.755		0.795	

note: *** p<0.01, ** p<0.05, * p<0.1

Table B3. Multi-state, School Level Nominal Spending

	Nominal Spending							
	No Race/State Fixed Effect		Race/State Fixed Effect		No Race/ District Fixed Effect		Race/ District Fixed Effect	
	coef	se	coef	se	coef	se	coef	se
Student Population								
% Black	2,278.121***	363.480	4,464.993***	364.943	7,121.786***	573.861	7,476.969***	582.694
% Hispanic	2,039.503***	261.301	978.892**	427.910	3,608.132***	377.009	1,662.472***	492.736
Neighborhood Poverty Index (IPR)			7.827***	0.374			1.362***	0.515
% English Language Learners (School)			8,884.355***	728.474			5,438.205***	626.044
% Students with Disabilities (School)	67,481.367***	3,227.090	67,785.914***	3,175.317	27,995.848***	1,970.313	29,438.065***	2,078.792
% Students Grades 9 to 12	733.266***	146.154	942.224***	147.153	-197.459**	93.593	10.381	100.246
State								
Colorado	(dropped)		(dropped)		(dropped)		(dropped)	
Delaware	-1,469.801***	412.810	-1,598.744***	438.380	-7,885.428**	3,064.565	-8,360.714***	3,043.311
New Jersey	16,681.946***	320.570	16,451.414***	334.154	45,270.213***	3,045.032	45,101.505***	3,025.025
New York	8,739.373***	204.163	8,851.368***	196.935	35,531.152***	3,120.918	3,405.343	3,827.285
Delaware	1,896.221***	204.556	2,551.746***	200.541	7,625.200*	4,262.742	7,653.701*	4,216.457
Year								
Year=2018	(dropped)		(dropped)		(dropped)		(dropped)	
Year=2019	-293.614***	56.719	-223.492***	56.041	34.137	45.192	69.629	45.490
Year=2020	384.228***	57.455	460.937***	56.913	749.424***	46.039	794.989***	46.484
Year=2021	943.800***	66.194	1,002.708***	65.040	1,434.487***	51.519	1,466.851***	52.102
Year=2022	2,949.309***	68.036	2,978.570***	67.223	3,486.938***	54.620	3,510.922***	55.104
Year=2023	4,058.578***	82.841	4,063.420***	81.765	4,682.487***	64.269	4,693.803***	65.089
Year=2024	6,342.739***	178.845	6,229.435***	183.245	6,938.650***	174.798	6,895.578***	179.389
Constant	2,426.604***	331.341	-1,740.548***	378.499	13,277.325***	3,050.078	12,746.342***	3,032.123
Number of observations	52,874		52,693		52,874		52,693	
R2	0.639		0.659		0.854		0.856	

note: *** p<0.01, ** p<0.05, * p<0.1

Table B4. Multi-state, school level spending adequacy

	Spending Adequacy							
	No Race/State Fixed Effect		Race/State Fixed Effect		No Race/ District Fixed Effect		Race/ District Fixed Effect	
	coef	se	coef	se	coef	se	coef	se
Student Population								
% Black	-0.381***	0.010	-0.251***	0.010	-0.371***	0.014	-0.377***	0.014
% Hispanic	-0.360***	0.008	-0.166***	0.011	-0.428***	0.013	-0.322***	0.015
Neighborhood Poverty Index (IPR)			0.000***	0.000			0.000***	0.000
% English Language Learners (School)			-0.204***	0.019			-0.240***	0.022
% Students with Disabilities (School)	-0.487***	0.029	-0.508***	0.030	-0.468***	0.046	-0.510***	0.052
% Students Grades 9 to 12								
	-0.027***	0.005	-0.042***	0.005	-0.033***	0.004	-0.042***	0.004
State								
Colorado	(dropped)		(dropped)		(dropped)		(dropped)	
Delaware	0.017	0.012	0.031***	0.011	-0.353*	0.198	-0.333*	0.199
New Jersey	-0.082***	0.008	-0.135***	0.008	3.145***	0.506	3.145***	0.583
New York	-0.155***	0.007	-0.159***	0.006	0.693***	0.199	-0.619***	0.208
Delaware	-0.036***	0.009	0.001	0.008	-0.235	0.250	-0.234	0.251
Year								
Year=2018	(dropped)		(dropped)		(dropped)		(dropped)	
Year=2019	0.015***	0.003	0.012***	0.003	0.015***	0.003	0.013***	0.003
Year=2020	-0.000	0.003	-0.004	0.003	0.001	0.003	-0.002	0.003
Year=2021	-0.002	0.003	-0.006*	0.003	-0.001	0.003	-0.003	0.003
Year=2022	0.030***	0.003	0.026***	0.003	0.032***	0.003	0.030***	0.003
Year=2023	0.011***	0.004	0.006*	0.003	0.014***	0.004	0.011***	0.004
Year=2024	0.012	0.009	0.010	0.009	0.020**	0.009	0.020**	0.009
Constant								
	1.227***	0.007	1.020***	0.010	1.559***	0.198	1.541***	0.199
Number of observations	52,795		52,639		52,795		52,639	
R2	0.360		0.450		0.643		0.677	

note: *** p<0.01, ** p<0.05, * p<0.1

Table B5. New Jersey Nominal Spending

	Statewide				District Fixed Effects			
	Race Only		Race, Poverty & ELL		Race Only		Race, Poverty & ELL	
	coef	se	coef	se	coef	se	coef	se
Student Population								
%Hispanic	3,210.312***	185.662	2,017.582***	391.516	1,511.393***	455.679	3,445.768***	533.766
%Black	5,061.486***	262.932	5,794.796***	371.132	5,593.310***	474.432	7,569.720***	532.851
% Free or Reduced Lunch			-1,125.972***	371.490			-3,341.833***	395.149
%Multilingual Learners			6,983.131***	610.085			799.243	525.172
% Disability	31,346.606***	748.242	31,939.082***	747.944	14,455.378***	567.351	14,414.307***	567.186
Enrollment Distribution by Grade Range								
% Grades 6 to 8	603.993***	155.217	981.086***	158.376	256.430**	107.125	317.642***	109.911
% Grades 9 to 12	2,555.121***	139.589	2,921.375***	145.344	1,059.545***	106.899	989.689***	110.250
School Enrollment								
Under 300	1,645.913***	194.442	1,811.397***	194.859	1,610.385***	152.396	1,598.202***	152.422
301 to 600	684.380***	123.256	749.855***	123.933	543.170***	95.755	530.762***	95.685
District Enrollment								
Under 500	1,262.111***	272.070	1,367.165***	271.199	3,659.185***	957.041	3,656.793***	954.372
501 to 1500	664.057***	146.690	722.125***	146.170	1,432.031**	658.961	1,438.361**	657.128
1501 to 2000	240.470	188.434	301.173	187.800	599.000	419.814	633.005	418.662
Year								
Year=2019								
Year=2020	964.838***	157.850	929.089***	157.680	1,089.700***	109.069	1,115.969***	109.181
Year=2021	998.097***	158.052	940.685***	158.042	1,077.776***	104.244	959.225***	104.870
Year=2022	2,553.224***	159.692	2,475.572***	159.858	3,023.192***	129.578	2,836.263***	131.167
Year=2023	5,292.992***	160.801	5,144.223***	162.474	5,305.147***	169.971	5,174.515***	170.220
Year=2024	6,476.751***	156.582	6,319.831***	156.735	7,003.532***	105.539	6,908.270***	106.205
NJ Centered CWIFT Index								
Constant	1,683.828**	708.940	1,103.131	731.306	-7,364.974***	2,690.499	-7,212.090***	2,683.691
Constant	16,243.651***	831.458	16,861.555***	863.424	22,599.696***	3,217.351	23,288.742***	3,209.583
Number of observations	14,182		14,161		14,182		14,161	
R2	0.299		0.306		0.712		0.714	

note: *** p<0.01, ** p<0.05, * p<0.1

DV=School Spending per Pupil with District Overhead

Table B6. New Jersey Spending Adequacy

DV=Current Spending/Adequacy Prediction	Statewide				District Fixed Effects			
	Race Only		Race, Poverty & ELL		Race Only		Race, Poverty & ELL	
	coef	se	coef	se	coef	se	coef	se
Student Population								
%Hispanic	-0.434***	0.006	-0.218***		-0.404***	0.015	-0.108***	0.017
%Black	-0.556***	0.008	-0.393***		-0.436***	0.015	-0.317***	0.017
%Free Lunch			-0.241***	0.012			-0.351***	0.014
%Multilingual Learners			-0.113***	0.014			-0.346***	0.016
% Disability	-0.351***	0.024	-0.380***	0.018	-0.528***	0.018	-0.563***	0.018
Enrollment Distribution by Grade Range								
% Grades 6 to 8	-0.011**	0.005	-0.023***	0.003	-0.031***	0.003	-0.048***	0.003
% Grades 9 to 12	-0.049***	0.004	-0.072***	0.003	-0.108***	0.003	-0.138***	0.003
School Enrollment								
Under 300	0.020***	0.006	0.008	0.005	-0.011**	0.005	-0.021***	0.005
301 to 600	0.015***	0.004	0.004	0.003	-0.010***	0.003	-0.015***	0.003
District Enrollment								
Under 500	-0.055***	0.009	-0.051***	0.030	-0.003	0.031	-0.005	0.030
501 to 1500	-0.024***	0.005	-0.026***	0.021	-0.019	0.021	-0.021	0.020
1501 to 2000	-0.046***	0.006	-0.043***	0.013	-0.047***	0.014	-0.046***	0.013
Year								
Year=2019								
Year=2020	-0.013**	0.005	-0.012**	0.003	-0.001	0.004	-0.001	0.003
Year=2021	-0.048***	0.005	-0.055***	0.003	-0.048***	0.003	-0.057***	0.003
Year=2022	-0.043***	0.005	-0.052***	0.004	-0.015***	0.004	-0.031***	0.004
Year=2023	0.032***	0.005	0.015***	0.005	0.002	0.006	-0.008	0.005
Year=2024	-0.002	0.005	-0.009*	0.003	0.007**	0.003	0.004	0.003
NJ Centered CWIFT Index	1.004***	0.023	0.897***	0.085	0.198**	0.087	0.234***	0.084
Constant	0.048*	0.026	0.186***	0.101	0.728***	0.104	0.788***	0.100
Number of Observations	14,129		14,129		14,129		14,129	
R2	0.446		0.463		0.763		0.783	

note: *** p<0.01, ** p<0.05, * p<0.1

Table B7. New York Nominal Spending

	Statewide				District Fixed Effects			
	Race Only		Race, Poverty & ELL		Race Only		Race, Poverty & ELL	
	coef	se	coef	se	coef	se	coef	se
<i>DV = School Level per Pupil Spending with Overhead</i>								
Student Population								
% Hispanic	-1,617.632***	526.945	767.501	663.806	-939.991	673.497	-3,867.354***	832.141
% Black	-1,899.214***	499.870	6,663.182***	590.811	1,024.308*	580.179	4,100.770***	755.292
% Economic Disadvantage			-12,874.606***	569.756			-2,732.343***	800.886
% ELL			19,842.721***	1,271.208			17,412.610***	1,094.760
% Disability	83,475.907***	2,905.883	87,908.974***	2,755.925	90,072.159***	2,815.181	90,544.717***	2,716.859
Enrollment Distribution by Grade Range								
% Grades 6 to 8	-1,080.861***	247.167	-42.423	217.224	-1,305.731***	157.406	-539.190***	159.120
% Grades 9 to 12	-575.524**	249.012	254.632	215.949	-739.616***	189.364	-54.880	180.999
School Enrollment								
Under 300	3,098.510***	272.795	3,200.065***	257.360	3,284.093***	279.616	3,201.506***	269.057
301 to 600	8,627.272***	1,754.770	8,426.531***	1,530.527	714.464	960.930	655.435	952.267
District Enrollment								
301 to 600	-1,379.869*	776.753	-1,647.521**	721.217	-669.393	1,071.642	-625.661	1,080.169
601 to 1200	1.138	370.544	-960.920***	343.067	-495.899	481.387	-485.750	481.122
1201 to 2000	-3,003.640***	325.852	-3,417.049***	306.833	-682.031*	398.084	-732.934*	396.740
Year								
Year=2019								
Year=2020	206.879***	47.959	318.430***	49.500	178.779**	75.776	321.810***	76.420
Year=2021	44.375	75.255	271.821***	75.961	-15.837	179.652	219.508	181.220
Year=2022	1,946.093***	120.640	2,111.265***	118.492	1,805.300***	321.191	2,139.663***	322.466
Year=2023	1,244.996***	167.492	1,859.278***	169.583	1,076.709**	484.734	1,686.851***	484.927
Year=2024	1,717.449***	218.212	2,569.791***	213.338	1,484.882**	613.232	2,265.210***	613.612
ECWI	7,897.361***	419.321	5,862.662***	417.182	8,217.679***	1,364.922	6,286.961***	1,367.174
Constant	-1,648.083*	982.556	5,981.676***	1,003.335	-3,921.125	2,826.515	-1,836.507	2,883.472
Number of observations	28,129		28,129		28,129		28,129	
R2	0.651		0.688		0.757		0.770	

note: *** p<0.01, ** p<0.05, * p<0.1

Table B8. New York Spending Adequacy

		Statewide				District Fixed Effects			
		Race Only		Race, Poverty & ELL		Race Only		Race, Poverty & ELL	
		coef	se	coef	se	coef	se	coef	se
Student Population									
	% Hispanic	-0.522***	0.007	-0.095***	0.009	-0.348***	0.007	-0.173***	0.008
	% Black	-0.508***	0.007	-0.153***	0.009	-0.324***	0.007	-0.246***	0.008
	% Economic Disadvantage			-0.568***	0.008			-0.252***	0.011
	% ELL			-0.062***	0.015			-0.167***	0.013
	% Disability	-0.677***	0.015	-0.503***	0.014	-0.481***	0.011	-0.456***	0.011
Enrollment Distribution by Grade Range									
	% Grades 6 to 8	0.025***	0.004	0.030***	0.004	0.011***	0.003	0.011***	0.003
	% Grades 9 to 12	0.016***	0.003	0.013***	0.003	0.005**	0.002	0.002	0.002
School Enrollment									
	Under 300	-0.034***	0.005	-0.030***	0.005	-0.031***	0.004	-0.031***	0.004
District Enrollment									
	Under 300	0.047**	0.024	0.094***	0.021	0.182**	0.074	0.180**	0.072
	301 to 600	0.003	0.012	0.057***	0.011	0.422***	0.044	0.421***	0.043
	601 to 2000	-0.008*	0.005	0.009**	0.004	0.018	0.018	0.016	0.018
Year									
	Year=2019								
	Year=2020	-0.027***	0.004	-0.031***	0.004	-0.034***	0.003	-0.035***	0.003
	Year=2021	-0.068***	0.004	-0.064***	0.004	-0.045***	0.004	-0.045***	0.003
	Year=2022	0.016***	0.004	0.005	0.004	0.006*	0.003	0.004	0.003
	Year=2023	-0.013***	0.004	-0.015***	0.004	-0.025***	0.003	-0.023***	0.003
Constant									
	2021-22 CWIFT, centered on NY minimum CWIFT	1.180***	0.006	1.390***	0.006	1.430***	0.029	1.554***	0.029
		0.731***	0.016	0.400***	0.015	-1.019***	0.116	-1.023***	0.114
	Number of observations	23,454		23,454		23,454		23,454	
	R2	0.415		0.523		0.715		0.728	
note: *** p<0.01, ** p<0.05, * p<0.1									