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The Distribution of School Resources in The United States: A Comparative Analysis Across Levels of Governance, Student Sub-groups, And Educational Resources

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The Distribution of School Resources in The United States: A Comparative Analysis Across Levels of Governance, Student Sub-groups, And Educational Resources

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Abstract:

Levels of governance (the nation, states, and districts), student subgroups (racial and ethnic minoritized and economically disadvantaged students), and types of resources (expenditures, class sizes, and teacher quality) intersect to represent a complex and comprehensive picture of K-12 educational resource inequality. Drawing on multiple sources of the most recently available data, we describe inequality in multiple dimensions. At the national level, racial and ethnic minoritized and economically disadvantaged students receive less K-12 expenditures per pupil than White and economically advantaged students (between $400 to $1,200 less per pupil). At the state and district levels, racial and ethnic minoritized and economically disadvantaged students receive more K-12 expenditures per pupil than white and economically advantaged students (between $200 to $400 more). The notable exception is Hispanic students, who receive no additional funding per pupil than white students, on average, at the state level. Among districts, minoritized and economically disadvantaged students have smaller class sizes than their subgroup counterparts, but these students also have greater exposure to inexperienced teachers. About 20 percent of additional teacher hires favoring traditionally disadvantaged student subgroups is for novice teachers. We see no evidence that district-level spending in favor of traditionally disadvantaged subgroups is explained by district size, average district spending, teacher turnover, or the size of the special education population.

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Introduction

In recent years, both popular media and academic scholarship have offered conflicting conclusions about U.S. school funding distributions. A report from *The Heritage Foundation* (2011) shows that Black students receive more funding than White students, while a report from EdBuild (2019) finds that Black students receive much less money than White students. Similarly, *The Economist* (2017) and the *Urban Institute* (Chingos & Blagg, 2017) report that students living in poverty receive more education funding relative to nonpoor students, but articles from the Education Law Center, Rutgers University (Baker, et al. 2018a; Baker, et al., 2018b), and *The Atlantic* (2016) argue that states spend less on students living in poverty. What is especially confusing about these contradictory inferences is that they rely on the same underlying data and similar methodological approaches.

These conflicting accounts have added confusion to an already complex debate about how schools are—and how they should be—funded. In this paper, we provide a detailed description of how districts and states distribute school funds and track the distributions of other resources related to school quality, including teacher counts and counts of novice teachers. We examine how funding and teacher resources are distributed to Black and Hispanic versus White students and to poor compared to nonpoor students to gauge whether distributions are progressive (favoring disadvantaged students) or regressive (favoring advantaged students). By studying three dimensions that determine distributional progressivity—governance level, resource type, and student group comparison—we provide comprehensive descriptions of how educational funding and resources are distributed in the U.S. Our goal with this work is to offer clarity that may reconcile conflicting accounts of funding progressivity or regressivity and to help structure policy initiatives that can improve distributions of funding and important school resources.

We emphasize several contributions of this work. First, although data on school-level spending have historically been limited, newly available national data offer opportunities to track spending distributions across multiple levels of governance: within districts, within states, and across the country. This contribution helps elucidate the sources of some of the conflicting narratives regarding how equitably resources are distributed, since analyzing at different governance levels can lead to different inferences regarding progressivity. States, for instance, can distribute additional funds to districts serving more free and reduced-price lunch eligible students, leading to progressive within-state distributions on average. If, however, lower-income students are concentrated in relatively lower-spending states or in states that distribute funds regressively, the national picture of funding distribution will be regressive.

Second, we conduct our analysis using multiple resource variables in addition to spending. We use these additional variables to show how variation in school quality may not align directly to spending progressivity because there may be limits to what additional funding can purchase. For example, even in districts that allocate additional funds to schools serving higher proportions of low-income students, these schools may have difficulty hiring experienced teachers. Describing both funding distributions and resource distributions can point to where additional policy tools may be useful for improving school quality.

Third, we conduct our analysis for multiple student group comparisons: Black and Hispanic versus White students and economically disadvantaged versus economically advantaged students. State funding formulas often target economic disadvantage through categorical aid grants and by directing state revenues to low property wealth districts, but do not make similar provisions based on race or ethnicity. A state's funding formula may therefore allocate funding progressively in the dimension of economic disadvantage but regressively in the dimension of race and ethnicity. By analyzing across governance levels, student groups, and resource types, we provide a more comprehensive portrait of resource distributions than has been conducted previously.

Finally, we also describe how district-level characteristics moderate the distribution of resource allocations. We test to what extent progressivity is explained by district size, special education enrollment, state-level differences, and teacher turnover.

Conceptual framework

An assessment of distributional progressivity depends on the intersection of three factors: governance level, student group, and resource type (e.g., Berne and Stiefel, 1979, 1999; Odden and Picus, 2019). Here we outline how each of these three factors contributes to a holistic description of school resource inequality.

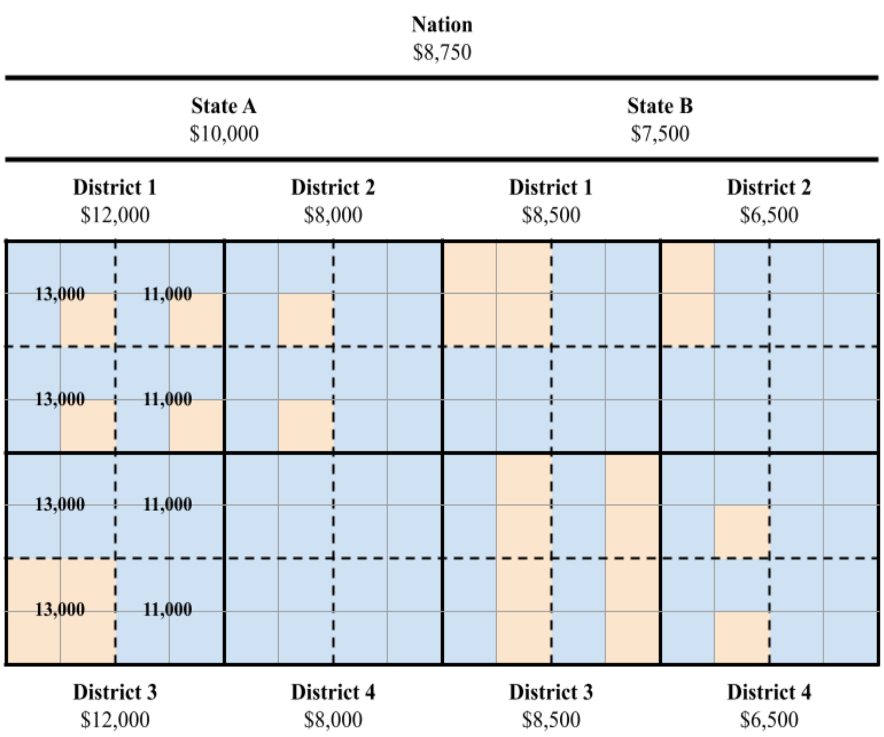
Governance levels

The following stylized example serves to illustrate how selecting a certain governance level for analysis can affect inferences about progressivity. Figure 1 shows a hypothetical nation containing two states, State A and State B, each with two higher-spending and two lower-spending districts. Dotted lines within these districts represent schools, and blue and orange squares represent students. State B contains more orange students than State A and spends less per pupil. The nation overall in this example thus allocates spending in favor of blue students, since most orange students are concentrated in the lower-spending state.

Looking within the states, however, the inference shifts. Most orange students in States A and B are concentrated in the higher-spending districts, Districts 1 and 3, which spend \$12,000 and \$8,500 per pupil compared to \$8,000 and \$6,500 per pupil in Districts 2 and 4. States A and B, therefore, allocate funds in favor of orange students. This example illustrates a form of Simpson's paradox, wherein each individual state allocates resources favoring one group (orange students), but the overall population (the nation) allocates resources favoring another group (blue students). In effect, analyzing resource distributions at different levels of governance can lead to different inferences regarding the distribution of resources to specific groups.

This example also illustrates the importance of considering how students are distributed across districts and schools. In State A, orange students in District 1 are distributed equally, comprising 25% of the student population in all four schools. Thus, even though the schools spend different amounts per pupil, \$13,000 versus \$11,000, this spending inequality favors neither blue nor orange students. Spending is distributed across schools the same way in District 3, with two schools spending \$13,000 per pupil and two spending \$11,000 per pupil; however, orange students are concentrated in one of the higher-spending schools, creating a within-district inequality favoring orange students.

Figure 1: Stylized Representation of School Spending Distribution between States and among Districts



Historically, data constraints have limited researchers' ability to analyze across these different levels of governance, especially for allocations among schools within districts. Before Every Student Succeeds Act mandated school-level finance reporting, only a handful of districts published data on how they distributed funding. We use newly-available data to track funding and resource distributions within districts (across schools), within states (across districts), and nationally. Analyzing distributions across multiple levels of governance allows us to show how inferences regarding funding and resource progressivity vary.

Student group comparison

Inferences about distributional progressivity will also depend on the student groups used for comparison. In this analysis, we compare how resources are distributed to Black versus White students, Hispanic versus White students, and poor versus nonpoor students. Black, Hispanic, and low-income students have fewer opportunities and face disadvantages in their pursuit of educational opportunities (Ladson-Billings, 2006; Carter and Welner, 2013) in comparison to White and higher-income students. We therefore choose to track resource distributions to these students.

We measure economic disadvantage using two sources of data, free and reduced-price lunch and Census-based estimates from the Small Area Income and Poverty Estimates (SAIPE). Both of these data sources have documented advantages and disadvantages as poverty indicators. Free and reduced-price lunch (FRL) only weakly tracks true poverty (Fazlul, Koedel, and Parsons, 2021; Domina, et al., 2018). The federal government also recently began offering Community Eligibility Provisions, which allow schools and districts whose student populations consist at least 40% of students who qualify for federal food and income assistance programs to give all students free school meals. The Community Eligibility Provision holds numerous benefits (e.g., Ruffini, 2021), but has made FRL a still less reliable measure of poverty (Chingos, 2016). Nevertheless, many states continue to use FRL counts in their funding formulae to demarcate economic disadvantage and allocate state aid (FRAC, 2017). Moreover, selection into FRL is thought to capture persistent features of poverty that correlate with student academic outcomes (Domina, et al., 2018; Michelmore and Dynarski, 2017). Finally, FRL is the only available data source for school-level poverty for all schools in the United States, meaning that FRL as a poverty indicator is necessary for us to conduct our school-level analysis. However, because FRL is not a wholly reliable measure of poverty, we also use the SAIPE, which measures proportions of school-age children living in poverty. SAIPE are not available at the school level, but measure poverty more accurately at the district and state levels than FRL.

Resource type

It is also important to analyze multiple educational resources to gain a full understanding of educational resource inequality. In this analysis, we examine distributions of funding and teacher quality. Funding is integral to student success (see Jackson, 2020 for a review of recent causal studies) but is not sufficient to determine access to educational quality. Teachers, in particular, are the most important in-school contributors to student success (Chetty et al., 2014; Rockoff, 2004), and numerous studies have demonstrated substantial benefits to low student-teacher ratios (Dynarski, et al., 2013; Finn, et al., 2005; Krueger, 1999;

Krueger & Whitmore, 2001) and teacher experience (Podolsky, et al., 2019). We therefore include teacher-to-student ratios and novice teacher-to-student ratios alongside total expenditures to describe distributions of different educational resources. Lastly, even in states where funding is distributed progressively, certain expenditure categories and revenue streams may not be equitably distributed. Capital spending, in particular, is usually governed by specific state rules related to district property wealth and increasing capital spending is often subject to district votes, and these rules can lead to regressive distributions of capital spending even in states that distribute overall funding distributions are progressive. Although capital spending's role in the education production function is unclear—some evidence suggests capital investments increase academic achievement by increasing student attendance (Lafortune & Schönholzer, 2017), but capital investment from the passage of new bonds has not increased student achievement (Baron, forthcoming)—inequality in new construction and capital expenditures generally is likely to fuel ongoing complaints about unequal educational spending and litigation.

Connecting the dots: How governance, subgroups, and resource types intersect to determine distributional progressivity

Inferences regarding resource inequality depend on the specific intersection of governance level, student group comparison, and resource type being considered. Many states and districts factor low-income status in their funding formulae (Chingos and Blagg, 2017), creating progressive funding distributions for economically disadvantaged students. These funding formulae do not, however, explicitly include provisions for students belonging to racially or ethnically marginalized groups (Poterba 1997; Ladd and Murray 2001), which creates risks of regressive distributions for these student populations. On the other hand, Black and Hispanic students tend to be concentrated in lower-income neighborhoods (Reardon, et al., 2015), so categorical aid for economically disadvantaged students may spill over to these minoritized groups—though the amount of aid they receive may be much less.

An assessment of resource inequality for any given subgroup can change, however, when looking across, as opposed to within, states. Average state K-12 spending varies dramatically among states and is strongly correlated with state-level poverty (Cascio and Reber, 2013). If states serving more low-income students spend less on education, or if low-income students are concentrated in regressive states, then school funding across states will be regressive for economically disadvantaged students. Indeed, Hispanic Americans, for example, are heavily concentrated within just two states, Texas and California (Saenz, 2004). And because Texas and California are comparatively low-spending, Hispanic students may also be subject to regressive national funding distributions.

Finally, the resource we investigate for a given subgroup and level of governance will also influence how we think about resource inequality. Though total educational expenditures are fundamental for analyzing resource inequality, a dollar is not necessarily equally efficacious in all places. For instance, schools serving more low-income and racially and ethnically minoritized students have more difficulty hiring and retaining high-quality teachers when quality is measured by contributions to student test scores (i.e., value added) or years of experience (Goldhaber and Lavery, 2015; Goldhaber, Quince, and Theobald, 2018). Thus, even in districts where total expenditures are allocated progressively, the distribution of teacher quality may be regressive. Similarly, capital expenditures are subject to district votes and, in some cases, depend on a district's assess property values, which can lead to regressive distributions of capital spending even where overall spending is progressive (Biasi, et al., 2021).

Data

To estimate educational resource inequality across states, within states, and within districts for multiple student subgroups and educational resources, we use four different sources of education data and a government survey of poverty estimates. We focus our analysis on the most contemporary publicly-available data, form the 2017-18 year. Our primary data source for district funding is the 2017-18 Local Education Agency financial survey (F-33) from the U.S. Department of Educations' National Center for Education Statistics. From the F-33, we use district-level variables for total expenditures and capital outlays.

Our primary data sources for school funding are the 2017-18 Civil Rights Data Collection (CRDC) from the Office of Civil Rights and the 2018-19 National Education Resource Database on Schools (NERD$) from the Edunomics Lab at Georgetown University.[1] From the CRDC, we use school-level variables for total personnel expenditures, total teacher salary expenditures, full-time equivalent (FTE) teacher counts, and novice FTE teacher counts (where novice is defined as having fewer than three years of experience). To complement these school-level data, we leverage the newly-available NERD$ dataset, which compiles school-level spending data. From this dataset, we obtain per-pupil total expenditures.

All spending variables are converted into 2017-18 academic year dollars using Consumer Price Index (CPI) based on Shores & Candelaria (2019). After CPI conversion, to account for regional differences in the costs of hiring teachers, all finance variables are then adjusted using the district-level Comparable Wage Index for Teachers (Cornman et al, 2019).[2] We then convert these CPI- and CWI-adjusted dollars to

[1] Data tables for finance variables available at:
F-33: https://nces.ed.gov/ccd/files.asp#FileNameId:5,VersionId:13,FileSchoolYearId:32,Page:1
NERD$: https://edunomicslab.org/our-research/financial-transparency/
,and CRDC: https://www2.ed.gov/about/offices/list/ocr/data.html. The 2017-18 CRDC and 2018-19 NERD$ are the most recently available data for school-level expenditures from these different sources, and there is no year in which these datasets overlap.

[2] CWIFT is a geographic cost measure that estimates the wages of college-educated non-teacher workers and normalizes the values such that the mean wage in the US is equal to 1, higher wages are greater than 1, and lower wages are less than 1. Expenditures and revenues are then adjusted by this normalized estimate of comparable wages. In districts where college-educated workers are paid greater than the national average, the value of an educational

per-pupil amounts. For F-33 expenditures, we use fall membership of the same academic year; for CRDC variables, we use CRDC total school-based enrollment to calculate per-pupil expenditures and teacher-to-student ratios; from NERD$, we use the per pupil amounts they provide directly.

To estimate funding inequality between student subgroups, we obtain school-level student counts for different racial, ethnic and economic subgroups. We use NCES' Common Core of Data (CCD)[3] and the CRDC for the 2017-18 and 2018-19 years. Both CCD and CRDC have enrollment by race and ethnicity (Black, White, Hispanic), but only the CCD has school-level enrollment data for poor and non-poor subgroups (measured by free and reduced-price lunch eligibility). To complement the socioeconomic analysis, we also obtain poverty measures from the Small Area Income and Poverty Estimates (SAIPE) for the 2017-18 and 2018-19 academic years; these data are only available at the district level.[4]

Our full dataset combines variables from these five sources to construct a dataset that reflects the three dimensions of distributional progressivity: levels of governance, student subgroup comparisons, and resource types. We use data from the F-33 for estimating resource gaps across the US and within states and data from NERD$ and the CRDC to estimate resource gaps within districts, as these are the only sources with school-level spending and teacher data. All finance data sources have per-pupil expenditure and revenue outliers, though data from the CRDC and NERD$ have more extreme outliers than the F-33. To adjust for these outliers, we apply a conservative winsorizing by replacing values greater than five times the 99th percentile with the value of five times 99th percentile.[5]

Methods

An inequality statistic that compares average levels of a resource for one group relative to another group at any level of governance can be written as:

$$Ineq_u = \frac{1}{N_1}\sum_{l=1}^{L}(\phi_{1l} \cdot Y_l) - \frac{1}{N_2}\sum_{l=1}^{L}(\phi_{2l} \cdot Y_l) \qquad (1)$$

The subscripts *u* and *l* indicate upper and lower levels of governance, respectively. For example, using school-level data to calculate the average resource inequality within a district containing *L* schools, *l* indicates a given school in the district, and *u* indicates the district. The upper level contains N_j students in group

dollar will be decreased, to reflect the relative costs required of the district to hire college-educated workers locally. CWIFT data available at : https://nces.ed.gov/programs/edge/Economic/TeacherWage.

[3] CCD data tables are downloaded through the Urban Institute education data API.

[4] Available at SAIPE: https://www.census.gov/programs-surveys/saipe.html

[5] In Appendix Table A1, we describe outliers present in both the CRDC and NERD$. The NERD$ dataset contains outliers with much larger per-pupil magnitudes than the CRDC. In addition, outliers in NERD$ tend to be concentrated in a few districts, whereas CRDC outliers are distributed somewhat evenly among districts.

$j \in \{1, 2\}$, where $j = 1$ for Black, Hispanic, or economically disadvantaged students and $j = 2$ for White or economically advantaged students. Y_l represents total resources (e.g., expenditures) at the lower level; and ϕ_{jl} represents the proportion of students from subgroup j = 1 that are in the lower level. The first term, where j = 1, therefore represents the share of school resources for Black, Hispanic or poor students, and the second term represents the share of resources for non-poor or White students (j = 2). This statistic can generate national (across-state) estimates (using school- or district-level data), within-state (across-district) estimates (using school- or district-level data), or within-district (across-school) estimates (using school-level data).

To summarize how much resource inequality there is on average across states or districts, one is faced with a choice about how to weight these state- or district-level observations. Four weighting schemes are prevalent: 1) equal weights, 2) enrollment weights, 3) inverse-variance weights, or 4) fixed-effects weights. One advantage of fixed effects weighting is that it allows us to estimate subgroup inequality gaps directly in a regression framework and obtain a standard error for the gap estimate. Though fixed effects regressions are commonplace, the implicit fixed effects weight is often disregarded. When the predictor variable is binary (as is the case when we have two subgroups), the fixed effect estimator is a weighted sum of the differences between subgroups $j \in \{1, 2\}$, which can be written as follows (Angrist and Krueger, 1999; Wooldridge, 2005):

$$E[\beta^{fe}] = \sum_1^u \left(\frac{n_{ju}\sigma^2_{j=1u}}{\sum_1^u n_{ju}\sigma^2_{j=1u}}\right)\widehat{Ineq_u} \tag{2}$$

In this expression, $E[\beta^{fe}]$ is the fixed effects weighted average of the state- or district-specific estimates of student subgroup inequality, where the difference in resources for any subgroup pairs $j \in \{1, 2\}$ calculated at any level of governance (u) is represented by $\widehat{Ineq_u}$. Taking the sum (Σ_1^u) of the weighted $\widehat{Ineq_u}$ yields the fixed effect estimate $E\left[\beta^{fe}\right]$. The weights are defined as $\left(\frac{n_{ju}\sigma^2_{ju}}{\Sigma_1^u n_{ju}\sigma^2_{ju}}\right)$, and the sum of these weights is equal to 1. The numerator of the weight represents the product of total enrollment for groups $j \in \{1, 2\}$ and the variance of the reference group's enrollment (j=*1*) for subgroups $j \in \{1, 2\}$ in governance level u (i.e., the level of governance at which the inequality is calculated). The denominator of the weight represents the product of the enrollments and variances for subgroups $j \in \{1, 2\}$ of all states or districts at the upper level of governance.

With these fixed effects weights in mind, we can write a regression equation that estimates resource gaps at any level of governance as follows:

$$Y_{lju} = \beta^{\text{fe}} group_{lju} + \Delta_u + \epsilon_{lju} \quad (3)$$

where Y indicates per-pupil resource (e.g., expenditures) levels for the lowest governance level l (e.g., a school) for group j (paired Black-to-white, Hispanic-to-white, or economic disadvantage-to-advantage student subgroups). Subscript u is the upper level of governance, which is the level of aggregation for the fixed effect. We can estimate gaps in the outcome of interest for the country by selecting u as the nation (or by excluding the fixed effect); we can obtain an average gap for states or districts by setting u as a state-level or a district-level fixed effect, respectively, denoted by Δ_u. Because our data are cross-sectional, we adjust ϵ_{igu} for heteroskedasticity but not serial correlation.

To estimate this model with aggregate data it is necessary to reshape the data so that there are two observations per *l* (i.e., lower levels of governance), where each row contains the per pupil resource amount and the enrollment of each group *j*. Then, an indicator variable is set to one for the row of data indicating the target group's enrollment (e.g., Black) and set to zero for the reference group's enrollment (e.g., White). Finally, in the regression, we weight the regression by enrollment which generate the difference in group means described in Equation 1.

Results

The main findings of this study are presented in Table 1 as resource inequality summary statistics by group pairing. Values greater than zero indicate progressivity in the resource distribution, whereas negative values show regressivity.[6] We report mean and standard error statistics of resource inequality for three different governance levels. Panel A presents the average resource inequality within the US, and Panels B and C show inequality within states and districts, respectively, using fixed-effects weighting. In each panel, different resource categories are included.

Across the entire U.S., resource distribution is mostly regressive. Black, Hispanic, and free-or-reduced lunch eligible students receive lower per-pupil total expenditures and capital expenditures than White and non-FRL students. Nationally, Black and FRL students receive about $400 less per pupil than White and non-FRL students, respectively, and Hispanic students receive more than $1,000 less per pupil than White students. Our gap estimates using SAIPE instead of FRL to measure poverty indicate progressivity, with children in poverty receiving $325 more per pupil than children not in poverty. Therefore, our assessment of national inequality as a function of economic disadvantage is sensitive to which measure of

[6] The signs indicated here hold except in the case of shares of novice teachers, where negative values indicate progressivity and positive values indicate regressivity.

Table 1: Resource Inequality Summary Statistics, by Group Pairing

	Black-White		Hispanic-White		FRL-Non-FRL (CCD)		Poor-Non-poor (SAIPE)	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Panel A: Within US								
Total expenditure	-394.94	73.79	-1166.66	60.51	-430.42	59.47	325.18	101.68
Capital outlays	-187.45	29.00	-63.17	24.67	-154.26	23.28	-75.13	29.62
N	24167		25404		24320		25880	
Panel B: Within States								
Total expenditure	441.43	53.92	9.95	48.14	278.66	42.16	529.49	75.52
Capital outlays	-93.58	29.41	-130.54	27.01	-131.50	22.86	-55.28	28.59
N	24167		25404		24320		25880	
Panel C: Within Districts								
Total expenditure	415.87	20.05	231.59	17.76	316.43	15.12	-	
N	155033		162185		152274		-	
							-	
Personnel salary	209.82	22.13	112.25	17.92	182.17	15.35	-	
Teacher salary	77.08	13.39	60.97	10.44	90.56	9.79	-	
Teachers	0.26	0.01	0.17	0.01	0.24	0.01	-	
Novice teachers	0.15	0.00	0.08	0.00	0.08	0.00	-	
N	161535		167704		156197		-	

Notes: All monetary resources are converted into 2017-18 academic year dollar and use the CWI. Teachers and Novice teachers indicate the total number of teachers (or novice teachers) per 100 students. Samples include 2017-18 F33 and CRDC, and 2018-19 NERD$. The source for expenditures in Panels A and B is the F-33; for teachers and novice teachers in Panels A through C is the CRDC. In Panel C, total expenditures is from the NERD$ dataset and all other resources are from the CRDC. All outliers are winsorized to match values at the 5×99^{th} percentile.

economic disadvantage is preferred. As discussed, the SAIPE better measures true child poverty, but FRL captures aspects of state funding policy and persistent poverty that may be missing from the SAIPE.[7]

Within states (Panel B), Black and economically disadvantaged students receive higher per-pupil expenditures than White and economically advantaged students, respectively. On average, Black students receive $441 more per pupil than White students, FRL students receive $279 more than non-FRL students, and children living in poverty (based on SAIPE) receive $529 more than children not living in poverty. The notable exception is Hispanic students, who, on average, receive only $10 more per pupil than White students—which is statistically indistinguishable from zero. Total spending gaps between children living above and below the poverty line, estimated using SAIPE data, are more than 1.5 times larger within states than across states (comparing Panels B and A), indicating that, even though national estimates are

[7] Our estimate using SAIPE data is no different from zero when New York state is dropped from the analysis. New York is the highest spending state in the U.S., on average, and represents more than 5% of total U.S. economically disadvantaged students and has a poverty-to-non-poverty estimate using SAIPE data of over $2,000 in favor of children in poverty compared to a FRL-to-non-FRL estimate of less than $500. Estimates using FRL data are not affected when New York is dropped from the analysis.

progressive, they are much more progressive within states than across states. Finally, our estimates for capital expenditures are regressive for all subgroups and across all levels of governance.

Results from Panel B should not be used to gloss over important heterogeneity across states in the progressivity of their spending. Figures 2a and 2b illustrate the per-pupil expenditure gaps in each state by student subgroup comparison (Figure 2a shows gaps for Black-White and Hispanic-White students, and Figure 2b shows gaps for FRL-non-FRL students and poverty-nonpoverty children), along with 95% confidence intervals. FRL-non-FRL and Pov-non-Poverty gaps show the general progressivity at the state level, whereas for Black-White and Hispanic-White gaps, many more states allocate expenditures per pupil regressively.[8]

Figure 2a: State-level total expenditure gaps: Black-White and Hispanic-White

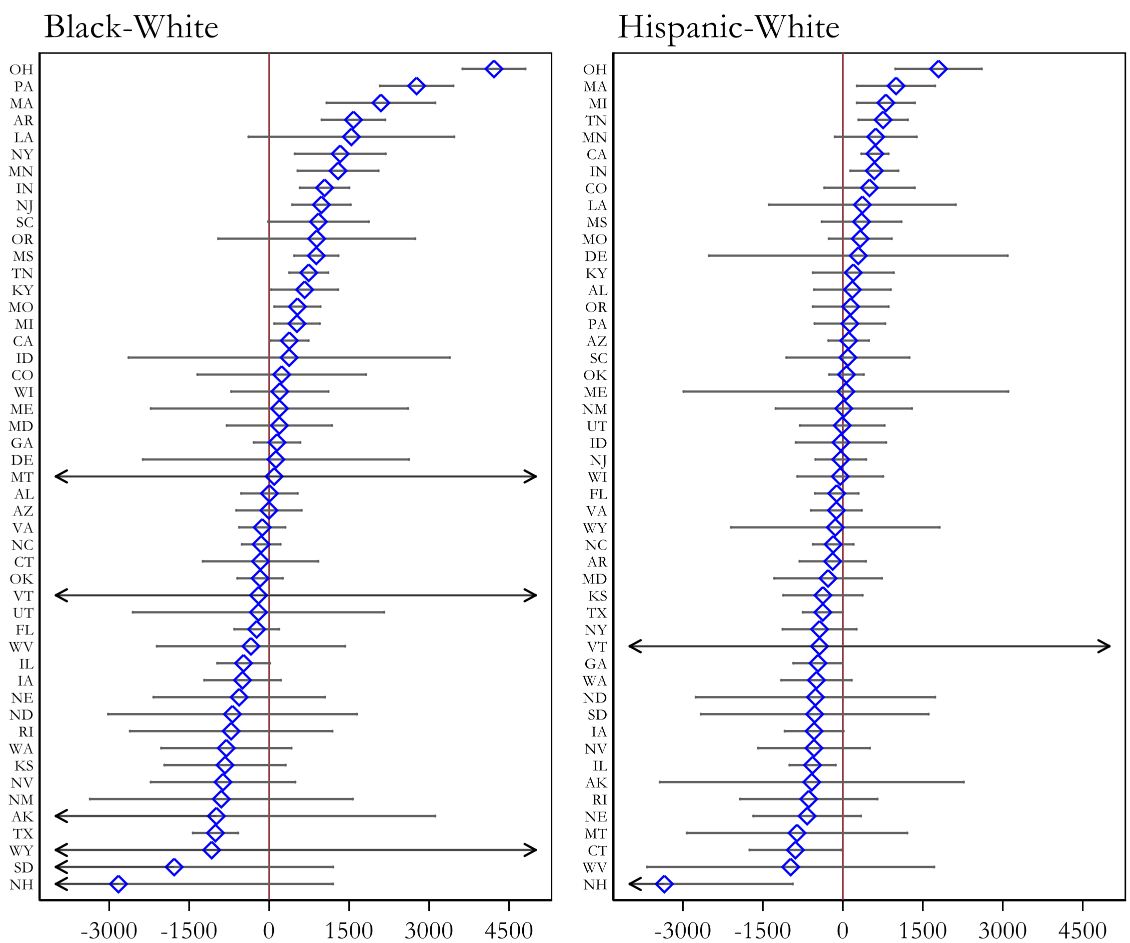


Figure 2a- The above figure shows the fixed-effect weighted gap in total expenditure with 95% CI, by group pairings: Black-White and Hispanic-White. Samples include student count from CCD at 2017-18 academic year and district expenditure from F-33 at 2017-18 academic year. All outliers are winsorized to be equal to 5 $\times$ 99th percentile.

[8] Note that taking the unweighted mean of these state-specific estimates will not yield the same result shown in the fixed effects regression from Table 1. As discussed in Equation 2, the fixed effect weighting gives more weight to states with higher variance in enrolment (e.g., group representation) and population size.

Figure 2b: State-level total expenditure gaps: FRL-non-FRL and Poverty-non-Poverty

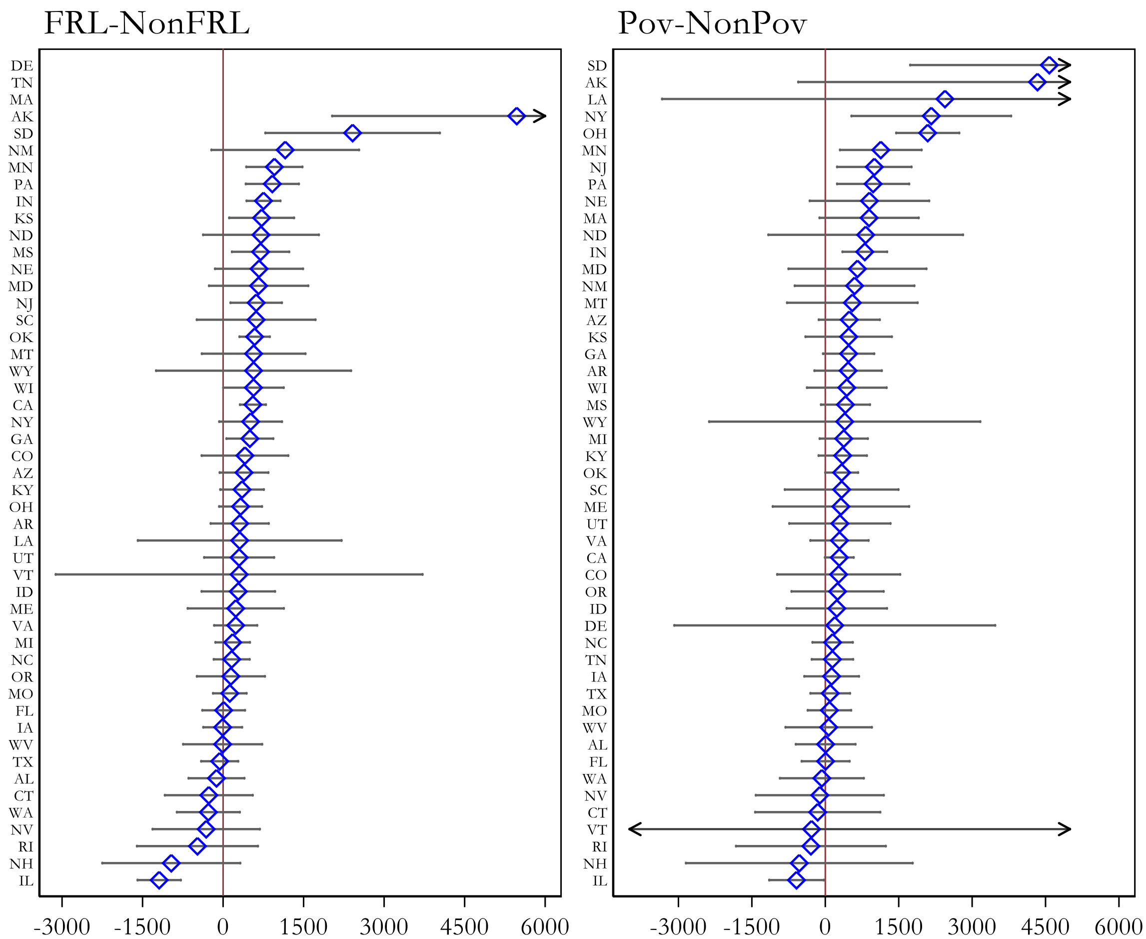


Figure 2b - The above figure shows the fixed-effect weighted gap in total expenditure with 95% CI, by group parings: FRL-NonFRL and Poverty-NonPoverty. Samples include student count from CCD at 2017-18 academic year and district expenditure from F-33 at the 2017-18 academic year. For the Pov-NonPov measure, we use SAIPE estimates for the 2017-18 academic year. All outliers are winsorized to be equal to 5 × 99th percentile. DE, TN, and MA do not have FRL reports in 2017-18 CCD.

At the district level (Table 1, Panel C), our results largely correspond to the estimates we obtain for states. Total expenditure data from NERD$ indicate overall progressivity: Black students receive $416 more per pupil than White students, and FRL students receive $316 more than non-FRL students. In contrast to state-level estimates, districts appear to allocate spending progressively toward Hispanic students, who receive $232 more per pupil than White students on average. Personnel and teacher expenditures reported in the CRDC show less progressivity overall than NERD$, though we cannot disambiguate whether this difference results from the data source or the expenditure type, since CRDC does not record total expenditures and NERD$ does not report personnel or teacher expenditures.[9]

[9] Additional results using alternative data specifications are shown in Appendix: Additional Results, tables A3 – A5.

For teacher and novice teacher counts, Black, Hispanic, and FRL students have more full-time equivalent (FTE) teachers per 100 students than White and non-FRL students, respectively. These gap estimates range from 0.17 to 0.26, meaning that disadvantaged student subgroups have, on average, about 2 more FTE teachers per 1000 students than their counterparts. These same subgroups, however, have more exposure to novice teachers. Novice teacher estimates range from 0.08 to 0.15, meaning that disadvantaged subgroups have about 1 additional novice teacher per 1000 students than their counterparts. This last result aligns with prior knowledge on teacher retention, as evidence shows that teacher turnover rates are higher

Table 2: Predictors of gaps in exposure to FTE and novice teachers

	Black - White		Hispanic - White		FRL - nonFRL	
Panel A: Gaps in Exposure to Novice Teachers						
Gaps in Exposure to FTE Teachers	0.18	***	0.2	***	0.17	***
	(0.02)		(0.02)		(0.02)	
Panel B: Gaps in Exposure to FTE Teachers						
Gaps in Teacher Salaries (in $1000s)	1.11	***	1	***	1.26	***
	(0.07)		(0.08)		(0.07)	
Panel C: Gaps in Exposure to Novice Teachers						
Gaps in Teacher Salaries (in $1000s)	0.17	***	0.19	***	0.18	***
	(0.03)		(0.03)		(0.04)	
N	11,146		12,078		11,977	

Notes: All regressions control for state fixed effects, log enrollment, and the percent of the population that receives special education services. Regressions are weighted by district enrollment.

in schools with more economically disadvantaged and racial/ethnic minority students (e.g., Ingersoll, 2001; Loeb, Darling-Hammond, and Luczak; 2005).

This pattern becomes clearer when we regress district-level gaps in exposure to novice teachers against district-level gaps in exposure to FTE teachers. In Table 2, Panel A we see that in districts where Black, Hispanic, and FRL students have more FTE teachers than White and non-FRL students, respectively, they also have more novice teachers. The estimates are nearly identical for each of the student subgroups at about 0.20. This means that when Black, Hispanic or FRL students have 10 additional teachers per 100 students than White or non-FRL students, they also have about 2 more novice teachers per 100 students than their White or non-FRL counterparts. In Panels B and C of Table 2, we further show that progressivity in teacher salaries corresponds to progressivity in class sizes and regressivity in exposure to novice teachers.

One thousand dollars in additional funding for disadvantaged groups yields about 1 additional FTE and 0.2 additional novice teachers. In effect, these results suggest that about 20 percent of new teacher hires favoring disadvantaged subgroups are for novice teachers.[10]

To better understand which types of districts are more progressive than others, we regress district-level total personnel spending gaps from the CRDC against the natural logarithm of enrollment, total district expenditures, discipline (school resource officers and security personnel) and support (psychologists and social workers) staff per 100 students, and special education students (the percent of students in the district who receive IDEA funding). We choose these predictors because each represents a district-level characteristic that might account for why a district is more progressive than others. For these predictors, our interest is in whether the direction and magnitude of the bivariate relationship changes our interpretation of the average level of within-district progressivity observed in Table 1. For log enrollment, perhaps larger districts allocate resources regressively, as some case studies have shown (e.g., Condron and Roscigno, 2003). For district-level per pupil expenditures, it may be that districts with lower spending tend to be those that distribute funding more progressively, which would mean that the disadvantaged subgroups are only likely to benefit in districts where total spending is lower. For discipline and support staff, perhaps districts that are more progressive are those that contribute larger allocations to auxiliary personnel, meaning that observed progressivity is partially offset by expenditures to non-instructional staff. Finally, progressivity may be correlated with the size of the special education population, which would indicate that the observed progressivity is being driven by contributions to special populations.

In Figure 3, we plot the beta coefficients from regressions in which the predictor is standardized to be mean zero with a standard deviation (SD) of one to facilitate comparisons across variables. Our outcome in these regressions is the district-level gap using total personnel spending from the CRDC; regression results are weighted by district enrollment.[11] Overall, we reject the idea that district-level progressivity is explained by spending that would not go directly to Black, Hispanic, or FRL students. First, larger districts tend to be more progressive. A 1-SD increase in log enrollment corresponds to about $70 to $100 more spending for Black, Hispanic, or FRL students. Second, districts with greater total spending are more progressive. A 1-SD increase in total expenditures per pupil corresponds to about $25 to $75 more spending for Black, Hispanic, or FRL students. Third, progressivity is not greater in districts with more discipline and support staff, meaning that additional dollars going to traditionally disadvantaged students are not being spent on these auxiliary personnel. Finally, there is no relationship between progressivity and the proportion

[10] Results reported in Table 2 are nearly identical when controls and fixed effects are excluded and in unweighted regressions.
[11] The displayed coefficients are nearly identical, both in magnitude and sign, when using district-level estimated gaps taken from NERD$ data.

of the special education population, meaning that additional dollars going to traditionally disadvantaged students are not earmarked for special needs students.

Figure 3: Correlates of District Gap Estimates

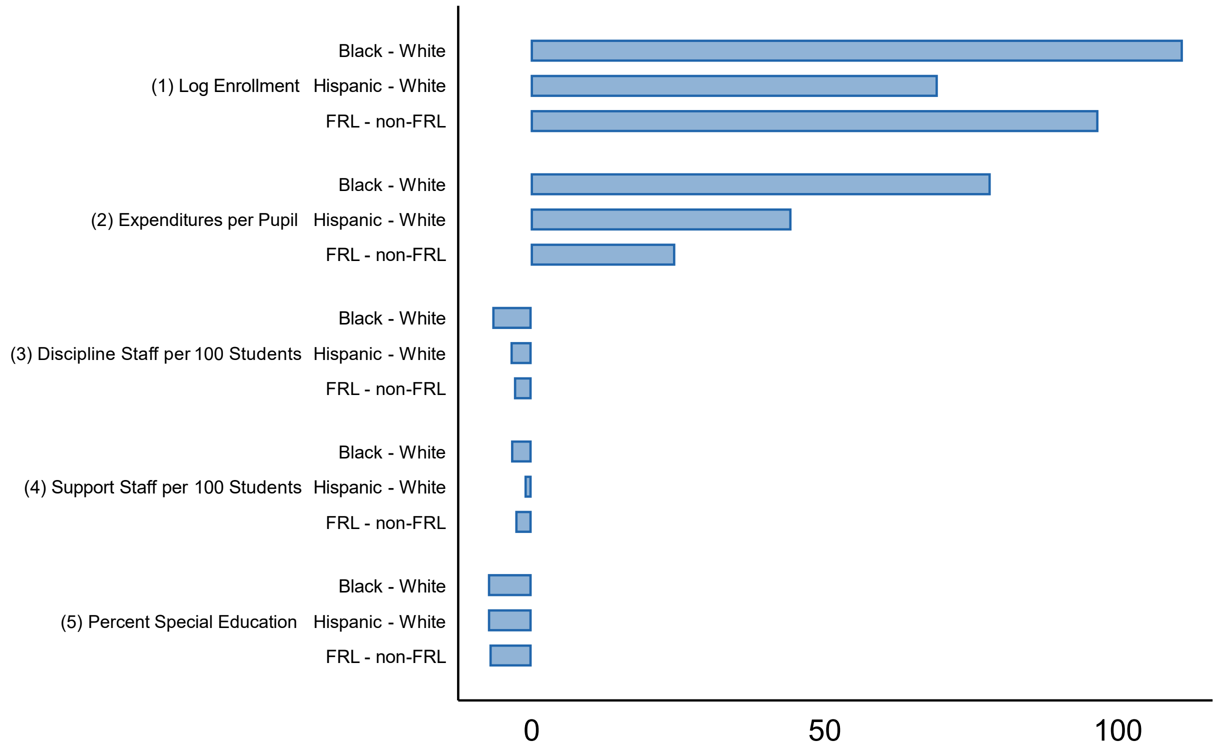


Figure 3 – The above figure shows the estimated bivariate relationship between the district-level total personnel spending gap and each element from (1) through (5). We obtain log enrollment and special education students (IDEA) counts from CCD at 2017-18 academic year, and per pupil expenditure is obtained from F-33 for the same sample year. Discipline staff and support staff counts are collected from 2017-18 CRDC. All predictors are standardized to be mean 0 with a standard deviation of 1.

Discussion: Policy Implications

The variation in our results underscores the importance of looking across multiple dimensions of inequality that work in concert to determine resource progressivity or regressivity. Policies aimed at achieving equitable resource distributions must consider how the three elements we include here—governance level, student group comparison, and resource type—intersect. Each of these three factors comes with a specific set of considerations, constraints, and opportunities. Different levels of governance have different policy levers at their disposal and face specific constraints and limitations. Each student group faces their own set of historical and institutional factors in their communities that contribute to their educational needs. And the distributions of some educational resources are easier to influence than others through targeted policies.

From our results, we identify three critical policy areas:

1. At the national level, Black, Hispanic, and FRL students receive less total spending per pupil than white and non-FRL students (between about $400 to $1,200 per pupil). Our back-of-the-envelope calculation suggests that these gaps could be eliminated with $11.4 billion, $26.5 billion, and $33.5 billion, respectively.[12]
2. At the state level, Hispanic students are not benefiting from current provisions in state funding formulae. Though Black and economically disadvantaged students receive more total spending than White and economically advantaged students (between about $300 to $500 per pupil), Hispanic students receive no more per-pupil funding than White students on average.
3. At the district level, Black, Hispanic, and FRL students continue to have greater exposure to inexperienced teachers on average, and about 20% of the additional spending on teachers going to these students at the district level is being used to hire inexperienced teachers. In short, the teacher quality gap is not being remedied by progressivity in the distribution of educational expenditures.

To remedy these inequalities in educational resources, policies will need to be tailored to each level of governance, subgroup population, and resource type. For example, the Biden administration's proposal to expand Title I to $36.5 billion could effectively close K-12 total spending gaps if those funds were targeted effectively and structured to prevent states from substituting their own contributions with federal funds (e.g., see Gordon and Reber, 2020).

At the state level, policy solutions are less clear, especially since gaps in funding for Hispanic students have not been widely documented (Jimenez-Castellanos, 2010). Changes to funding formula that target ethnicity directly are unlikely, but additional aid to English Language Learners and block grants to regions (e.g., rural areas) where Hispanic students primarily attend schools represent potential paths forward (Jimenez-Castellanos and Topper, 2012).

Improving measures of resource equity beyond spending introduces additional challenges. The difficulty in recruiting and retaining experienced teachers in schools with more economically disadvantaged and minoritized students is an entrenched feature of K-12 schooling that is difficult to target through policy change. Governance structures are ill-equipped to change the geographic distribution of the labor force, which creates difficulties for districts and schools trying to attract high-quality teachers from a local

[12] To obtain these numbers, we generate per pupil spending estimates for Black, Hispanic, and FRL students for each state. We then calculate the national per pupil spending level for white and non-FRL students. We then take the difference between these Black, Hispanic, and FRL state-level per pupil estimates and the national subgroup mean and multiply that difference by the state-level Black, Hispanic, and FRL enrollment. Ignoring values less than zero (i.e., those states where the subgroup level of mean spending exceeds the reference group's national average), the sum of this product across states yields the total cost to close the spending gap.

pool of teachers. Policies must also confront widespread preferences in the teacher labor supply for academically and socially advantaged students. Our estimates speak to these challenges: even with spending distributed progressively, on average, within districts, disadvantaged students are still more likely to have novice teachers. Moreover, Table 1 shows that salary expenditures favor Black, Hispanic, and FRL students by about $75 per pupil. Extrapolating from these estimates using a 16-to-1 student-teacher ratio (the national average according to the NCES)[13] shows that even in an all-Black, -Hispanic, or -FRL classroom, a teacher's salary would only be about $1,120 higher than a teacher's salary in an all-White or all-non-FRL classroom. This salary benefit is much smaller than some high-profile initiatives to encourage more experienced teachers to move to hard-to-staff schools (Martin, 2007). Given that salary expenditures only weakly encourage more experienced teachers to move to economically disadvantaged schools (Hanushek, Kain, and Rivkin, 1999; Loeb and Page, 2000), the current level of progressivity for salary expenditures at the district level is likely to be inadequate.

Conclusion

We synthesize K-12 resource inequality across three dimensions—level of governance, student subgroup comparison, and resource type—and estimate distributional progressivity at different intersections of these three dimensions. We show that inferences regarding whether resource distributions are progressive or regressive change meaningfully across all three of these dimensions—national estimates of spending progressivity are markedly different from within-state and within-district estimates; spending inequalities between Hispanic and White students are very different, especially at the national and state levels, from inequalities between Black and White and economically disadvantaged and advantaged students; and distributions of novice teachers are regressive even where spending distributions are progressive. This framework, and the estimates we generate using it, can inform debates on school resource distributions, reveal bottlenecks where current policies governing resource distribution fall short, and are relevant for structuring new policies aimed at improving distributional equity. Because we see this work as ongoing, we provide details about data and methodology so that similar comprehensive descriptions of resource distributions can be feasibly generated as new data emerge so that a "national report card" of K-12 resource inequality can be generated and disseminated.

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Appendix: Comparing NERD$ Outliers and CRDC Outliers

Table A1: Summary for NERD$ Outlier

Resource: NERD$ total expenditure, Outlier 5: 7.10 (41.95), [Pct. all outliers 0.110; 99th ptile = 41667]

Pct. Total Outliers in District with 90% Outliers 41.30; Num. dists with 90% Outliers 3

Pct. Total Outliers in District with 80% Outliers 41.30; Num. dists with 80% Outliers 3

Pct. Total Outliers in District with 70% Outliers 71.74; Num. dists with 70% Outliers 5
Pct. Total Outliers in District with 60% Outliers 83.70; Num. dists with 60% Outliers 7
Pct. Total Outliers in District with 50% Outliers 90.22; Num. dists with 50% Outliers 10

Resource: NERD$ total expenditure, Outlier 2.5: 80.56 (28.07), [Pct. all outliers 0.196; 99th ptile = 41667]

Pct. Total Outliers in District with 90% Outliers 30.06; Num. dists with 90% Outliers 6
Pct. Total Outliers in District with 80% Outliers 34.97; Num. dists with 80% Outliers 7
Pct. Total Outliers in District with 70% Outliers 52.15; Num. dists with 70% Outliers 9
Pct. Total Outliers in District with 60% Outliers 53.99; Num. dists with 60% Outliers 10
Pct. Total Outliers in District with 50% Outliers 58.90; Num. dists with 50% Outliers 14

Resource: NERD$ total expenditure, Outlier 2: 93.61 (25.78), [Pct. all outliers 0.257; 99th ptile = 41667]

Pct. Total Outliers in District with 90% Outliers 26.17; Num. dists with 90% Outliers 13
Pct. Total Outliers in District with 80% Outliers 29.91; Num. dists with 80% Outliers 14
Pct. Total Outliers in District with 70% Outliers 42.99; Num. dists with 70% Outliers 16
Pct. Total Outliers in District with 60% Outliers 48.13; Num. dists with 60% Outliers 19
Pct. Total Outliers in District with 50% Outliers 52.80; Num. dists with 50% Outliers 24

Resource: NERD$ total expenditure, Outlier 1.5: 105.67 (23.75), [Pct. all outliers 0.429; 99th ptile = 41667]

Pct. Total Outliers in District with 90% Outliers 19.89; Num. dists with 90% Outliers 26
Pct. Total Outliers in District with 80% Outliers 22.13; Num. dists with 80% Outliers 27
Pct. Total Outliers in District with 70% Outliers 33.61; Num. dists with 70% Outliers 30
Pct. Total Outliers in District with 60% Outliers 36.69; Num. dists with 60% Outliers 33
Pct. Total Outliers in District with 50% Outliers 42.30; Num. dists with 50% Outliers 43

Resource: NERD$ total expenditure, Outlier 1: 114.02 (21.89), [Pct. all outliers 0.999; 99th ptile = 41667]

Pct. Total Outliers in District with 90% Outliers 19.71; Num. dists with 90% Outliers 95
Pct. Total Outliers in District with 80% Outliers 24.04; Num. dists with 80% Outliers 98
Pct. Total Outliers in District with 70% Outliers 27.40; Num. dists with 70% Outliers 100
Pct. Total Outliers in District with 60% Outliers 29.45; Num. dists with 60% Outliers 105
Pct. Total Outliers in District with 50% Outliers 39.66; Num. dists with 50% Outliers 137

Notes: Table A1 reports the outliers in NERD$ total expenditure. For example, in the top panel, we define outliers as values larger than 5 times the 99^{th} percentile. Here, 11% of the whole sample is classified as outliers, 90.22% of these outliers are concentrated in 10 districts, and at least 50% of schools in these districts contain outliers.

Table A2: Summary for CRDC Outlier

Resource: CRDC personnel salary, Outlier 5: -70.34 (16.88), [Pct. all outliers 0.114; 99th ptile = 27662]

Pct. Total Outliers in District with 90% Outliers 8.08; Num. dists with 90% Outliers 5

Pct. Total Outliers in District with 80% Outliers 8.08; Num. dists with 80% Outliers 5

Pct. Total Outliers in District with 70% Outliers 8.08; Num. dists with 70% Outliers 5

Pct. Total Outliers in District with 60% Outliers 14.14; Num. dists with 60% Outliers 7

Pct. Total Outliers in District with 50% Outliers 34.34; Num. dists with 50% Outliers 17

Resource: CRDC personnel salary, Outlier 2.5: -70.30 (13.98), [Pct. all outliers 0.231; 99th ptile = 27662]

Pct. Total Outliers in District with 90% Outliers 6.50; Num. dists with 90% Outliers 9

Pct. Total Outliers in District with 80% Outliers 6.50; Num. dists with 80% Outliers 9

Pct. Total Outliers in District with 70% Outliers 6.50; Num. dists with 70% Outliers 9

Pct. Total Outliers in District with 60% Outliers 12.50; Num. dists with 60% Outliers 12

Pct. Total Outliers in District with 50% Outliers 30.50; Num. dists with 50% Outliers 30

Resource: CRDC personnel salary, Outlier 2: -70.30 (13.32), [Pct. all outliers 0.326; 99th ptile = 27662]

Pct. Total Outliers in District with 90% Outliers 6.03; Num. dists with 90% Outliers 13

Pct. Total Outliers in District with 80% Outliers 6.03; Num. dists with 80% Outliers 13

Pct. Total Outliers in District with 70% Outliers 6.03; Num. dists with 70% Outliers 13

Pct. Total Outliers in District with 60% Outliers 12.41; Num. dists with 60% Outliers 18

Pct. Total Outliers in District with 50% Outliers 29.43; Num. dists with 50% Outliers 41

Resource: CRDC personnel salary, Outlier 1.5: -69.97 (12.43), [Pct. all outliers 0.515; 99th ptile = 27662]

Pct. Total Outliers in District with 90% Outliers 6.05; Num. dists with 90% Outliers 23

Pct. Total Outliers in District with 80% Outliers 6.05; Num. dists with 80% Outliers 23

Pct. Total Outliers in District with 70% Outliers 6.95; Num. dists with 70% Outliers 24

Pct. Total Outliers in District with 60% Outliers 15.25; Num. dists with 60% Outliers 33

Pct. Total Outliers in District with 50% Outliers 30.04; Num. dists with 50% Outliers 65

Resource: CRDC personnel salary, Outlier 1: -70.57 (11.36), [Pct. all outliers 1.001; 99th ptile = 27662]

Pct. Total Outliers in District with 90% Outliers 7.04; Num. dists with 90% Outliers 44

Pct. Total Outliers in District with 80% Outliers 7.04; Num. dists with 80% Outliers 44

Pct. Total Outliers in District with 70% Outliers 7.50; Num. dists with 70% Outliers 45

Pct. Total Outliers in District with 60% Outliers 16.38; Num. dists with 60% Outliers 66

Pct. Total Outliers in District with 50% Outliers 33.45; Num. dists with 50% Outliers 134

Notes: Table A2 reports the outliers in CRDC personnel salary. For example, in the top panel, we define outliers as values larger than 5 times the 99^{th} percentile. Here, 11.4% of the whole sample is classified as outliers, 34.34% of these outliers are concentrated in 17 districts, and at least 50% of schools in these districts are outliers. The total share of outliers in the data is almost the same in both NERD$ and CRDC by construction because outliers are based on the sample distribution, but the distribution of those outliers is more concentrated in a handful of districts in NERD$ relative to the CRDC.

Appendix: Additional Results

We also estimate resource inequality gaps with different data. Tables A3 through A5 present those results. First, we estimate the inequality gap without CWI adjustment (Table A3). Without the CWI, national regressivity in total expenditures for Black-White and Hispanic-White gaps disappears, regressivity for FRL-non-FRL gaps remains, and progressivity for poverty-non-poverty gaps shrinks. Within states, Black-White progressivity decreases but Hispanic-White distributions change from neutral to progressive and economically disadvantaged-advantaged distributions become more progressive. Within-district estimates are comparable to those in Table 1. Next, in Table A4, we estimate the Panels A and B of Table 1 again, but this time using school-level data (i.e., NERD$ and CRDC). With school-level data, at the national level, Black-White and Hispanic-White total expenditure gaps are similar but the FRL-Non-FRL gap is now no different from zero. At the state level, Black-White, Hispanic-White, and FRL-non-FRL gaps are nearly identical. Finally, Table A5 presents the inequality gap in 2013-14 and 2015-16 academic years. The total expenditure and total revenue in previous years follow a similar pattern as shown in Table 1, regressive nationally and progressive within states.

Table A3: Resource Inequality Summary Statistics, by Group Pairing (w/o CWI)

	Black-White		Hispanic-White		FRL-Non-FRL (CCD)		Poor-Nonpoor (SAIPE)	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Panel A: Within US								
Source: F33								
Total expenditure	11.84	75.05	-22.68	66.95	-547.53	66.20	98.59	105.39
Capital outlays	-172.68	24.53	11.68	21.31	-173.99	20.19	-90.03	27.67
N	29514		30776		28524		25880	
Panel B: Within States								
Source: F33								
Total expenditure	775.40	57.57	306.22	58.00	60.09	51.74	369.67	72.53
Capital outlays	-82.73	24.79	-121.69	23.36	-157.32	19.76	-66.59	26.51
N	29514		30776		28524		25880	
Panel C: Within Districts								
Source: NERD$								
Total expenditure	395.33	19.79	241.77	17.47	301.75	15.21		
N	167101		174583		164164			
Source: CRDC								
Personnel salary	194.75	18.75	108.35	15.37	169.87	13.22		
Teacher salary	73.13	11.85	59.76	9.48	86.96	8.89		
N	169845		176011		163574			

Notes: We estimate the same group pairing gaps in school resources as Table 1 but without CWI adjustment. FTE teachers and novice teachers are not included in this table since they are not subject to CWI adjustment. All monetary resources are converted into 2017-18 academic year dollar. Samples include 2017-18 F33 and CRDC, and 2018-19 NERD$. Within the entire United States, the distribution of resources is regressive or not different from zero. This change is noticeable since we have clear regressivity with CWI adjustment. Within states and within districts have a similar pattern with the results of Table 1 since they show clear progressivity. Within states, the distribution of capital expenditure still favors White or economically advantaged students, consolidating the findings from Table 1 and previous literature. (Biasi et al., 2021)

Table A4: Resource Inequality Summary Statistics, by Group Pairing (w/ School-Level Data)

	Black-White		Hispanic-White		FRL-Non-FRL (CCD)	
	Mean	SE	Mean	SE	Mean	SE
Panel A: Within US						
Source: NERD$						
Total expenditure	-393.89	40.77	-618.27	41.06	11.17	41.24
N	155832		162471		152326	
Source: CRDC						
Personnel salary	-139.57	22.40	-533.86	18.06	-69.81	18.05
Teacher salary	-216.76	13.99	-460.84	10.97	-151.95	11.60
N	162356		168095		156381	
Panel B: Within States						
Source: NERD$						
Total expenditure	402.79	39.31	18.67	43.65	427.07	39.61
N	155832		162471		152326	
Source: CRDC						
Personnel salary	47.68	22.31	-62.82	19.27	180.97	17.33
Teacher salary	-58.91	13.41	-81.48	11.14	42.06	10.76
N	162356		168095		156381	

Notes: The above table presents the resource inequality gap at the national level and state level, as in Panel A and Panel B of Table 1 but use school level data (NERD$ and CRDC). All monetary resources are converted into 2017-18 academic year dollar, and adjusted using CWI estimates. In terms of total expenditure, the distribution is regressive across states but progressive within states in general. The FRL-Non-FRL gap is slightly progressive at the national level but not significant. Personnel salary gaps and teacher salary gaps are regressive for all group pairings at the national level, but this tendency is less clear at the state level. Black students have more personnel salary expenditure within states but less for teacher salary. Hispanic students receive less funding both in personnel salary and teacher salary at the state level, while FRL students get more than their counterparts.

Table A5: Resource Inequality for 2013-14 and 2015-16 Academic Year

	Black-White		Hispanic-White		FRL-Non-FRL (CCD)		Poor-Nonpoor (SAIPE)	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Panel A: 2015-2016 Academic Year								
A1: Within US								
Total expenditure	-409.68	71.97	-1342.42	61.10	-562.20	57.86	146.44	79.89
Total revenue	-489.10	68.70	-1257.30	57.68	-530.27	55.11	140.29	75.38
Instructional salary	-297.07	21.94	-489.82	18.55	-305.91	17.38	-61.42	24.54
Capital outlays	-216.66	28.09	-146.87	24.10	-143.84	21.71	-83.96	26.54
N	24205		25336		25182		25801	
A2: Within States								
Total expenditure	350.07	51.80	-6.55	49.10	281.07	41.18	383.14	50.42
Total revenue	295.35	44.86	30.25	42.41	330.64	36.19	375.78	44.98
Instructional salary	-117.27	12.64	-76.33	11.45	-19.92	9.76	6.68	11.92
Capital outlays	-134.01	28.42	-159.17	26.39	-135.97	21.42	-63.76	25.60
N	24205		25336		25182		25801	
Panel B: 2013-2014 Academic Year								
B1: Within US								
Total expenditure	-138.25	71.26	-1533.53	60.78	-432.82	56.97	146.07	76.39
Total revenue	-284.47	70.25	-1690.92	59.51	-529.45	56.13	70.10	74.73
Instructional salary	-249.98	22.18	-578.26	18.93	-288.95	17.43	-70.13	23.70
Capital outlays	-86.62	23.78	-54.76	20.55	-33.69	18.38	15.60	22.76
N	24129		25270		25595		25287	
B2: Within States								
Total expenditure	509.44	53.17	115.56	50.05	395.30	40.64	451.18	50.38
Total revenue	416.70	49.25	67.60	45.99	343.74	37.69	391.81	47.61
Instructional salary	-83.18	13.83	-55.91	12.56	-7.38	10.13	25.91	12.31
Capital outlays	-35.00	24.32	-47.04	22.88	-24.56	18.21	20.02	22.24
N	24129		25270		25595		25287	

Notes: The table reports the resource inequality gaps for each group pairing at the national level and the state level, but this time, it uses 2013-14 and 2015-16 academic year data. All monetary variables are obtained from F-33 report and converted into 2017-18 academic year dollar and use CWI. The total expenditure and total revenue show the similar pattern that we see in Table 1. The resource distribution is regressive in state level and progressive in state level for Black-White, Hispanic-White and FRL-Non-FRL group pairings. Poor-Nonpoor gap using SAIPE is also same as table 1, which favors disadvantaged group across and within states. However, instructional salary and capital outlays show general regressivity at both national and state level. Some estimates in Poor-Nonpoor gaps are positive, but most of them are not statistically significant.