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SCHOOL SPENDING EQUITY SINCE 1976

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Contents

DISCLOSURES

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Introduction

Inequality of educational outcomes by race and class is large and persistent (Reber, Kalkat, and Goodman 2025; Reardon, Kalogrides, and Shores 2019), and the role that schools do or could play to reduce these gaps is complex and long debated. Schools in high-poverty or predominantly non-white communities often fail to serve their students well. Many point to American schools' reliance on local property taxes as the culprit, arguing the school finance system ensures that "affluent areas end up with well-funded schools and low-income areas end up with poorly funded schools," (American University 2020). However, state governments now contribute about as much to school funding as school districts raise locally, and the federal government also contributes. Moreover, state and federal funding disproportionately benefits school districts serving low-income students, and decades of school finance reforms mean that schools' spending is less tied to its property wealth than in the past.

Do high-poverty and predominantly non-white districts spend less than their lower-poverty or predominantly white counterparts? How has that changed over time as policy preferences evolved and states reformed their school finance systems? In this report, we use newly assembled school district level data spanning 1976 to 2021 to address these questions. We present a comprehensive descriptive analysis of how school spending varies across districts depending on child poverty and racial composition and how that has changed since 1976. To make sense of these patterns, we also decompose differences in average spending into their between-state and within-state components. Average spending varies tremendously across states—some spend nearly three times what others do (Reber and Goodman 2025)—so we ask: When some districts spend more than others, is it because they are in states where all districts spend more or because they spend more than other districts in the same state?

The patterns of spending by poverty and racial composition were surprisingly similar at the beginning and end of the nearly five decades we study, though this masks some changes in the intervening years. Spending trended less equitable (or progressive)—in the sense of being less targeted to disadvantaged students—in the 1980s and early 1990s and then trended more equitable after 1995.

The analysis shows that between 1976 and the early 1990s the average level of spending increased, but the distribution of spending changed only modestly, becoming somewhat less progressive. After about 1995, spending within states was increasingly targeted to high-poverty districts, though between-state differences increasingly favored lower-poverty districts. That is, low-poverty districts were more likely to be in states where average spending was higher, but they had lower spending relative to high-poverty districts in the same state. We also find that low-poverty and predominantly white districts were more protected from spending cuts during the Great Recession, and high-poverty or predominantly non-white districts were the least protected. Finally, differences in average spending between states remain a major driver of spending inequality overall, even though policy conversations often focus on within-state differences.

The findings are broadly consistent with recent academic work on patterns of school spending, which finds within-state progressivity (increasing since the mid-1990s) and usually modest national-level differences in spending by poverty and race (Tyner 2023; Corcoran et al. 2003;

Corcoran and Evans 2015; Candelaria and Shores 2019). However, our findings are contrary to popular narratives that often assume that high-poverty or predominantly non-white districts have lower-than-average spending.[1]

Several factors may contribute to the disconnect between conventional wisdom about inequality of school funding and our findings. First, the conventional narrative is bolstered by schools' historical—and sometimes continued—reliance on local property taxes for funding. It seems intuitive that this would create a correlation between property wealth and school spending, which could in turn explain observable problems in high-poverty schools, such as staffing shortages, lack of supplies, or ill-maintained buildings. School finance systems are complex, and local taxes are salient to the public. By contrast, funding from the state or federal government, which disproportionately benefits more disadvantaged districts, is less visible.

Jonathan Kozol, author of the 1991 bestseller "Savage Inequalities," was an especially forceful promoter of the idea that high-poverty schools struggle for the simple reason that they have less to spend. He told the stories of urban schools that lack "the basic elements of learning," concluding that "schools for rich and poor [are] blatantly unequal" and attributing these gaps to funding differences related to local property tax finance (Kozol 1991). Although Kozol's account was based on a small number of districts and is more than 30 years old, some widely discussed reports based on systematic analysis of more recent school finance data come to similar conclusions. Like Kozol, they argue that high-poverty or predominantly minority districts are being shortchanged financially (Baker et al. 2018; EdBuild 2019; Morgan and Amerikaner 2018; Morgan 2022). These studies—which are designed to answer different questions—make methodological choices that can obscure patterns of actual spending, for example, excluding federal funding (Morgan and Amerikaner 2018; Morgan 2022; EdBuild 2019) or reporting spending relative to a complex (and controversial) estimate of what a district needs (Baker et al. 2018; Costrell, Hanushek, and Loeb 2008). That is, they are not reporting on differences in actual per-pupil spending or revenue.

We agree with the authors of those reports—and the broader consensus—that high-poverty schools need more funding than their low-poverty counterparts to fulfill their mission; equal is not equitable. Answering questions about what constitutes a fair or equitable distribution of spending and how to spend education dollars effectively is important but difficult. Our goal here is more modest but perhaps more achievable. The analysis does not speak to whether high-poverty or minority-serving schools have "enough" funding—or whether or under what conditions additional funding would improve student outcomes. Instead, we document what happened: Which districts spent more, and which spent less? How has the distribution of school spending changed? This nearly five-decade national perspective captures how spending patterns evolved as states reformed their finance systems, sometimes multiple times, during the school finance reform era.

The remainder of this report proceeds as follows. Section 2 provides historical context on school finance in the United States. Section 3 describes our data and approach. Section 4 presents findings on spending trends by the child poverty rate, and Section 5 presents findings on trends by racial composition. Section 6 addresses why our results seem to contradict some widely cited reports from advocacy organizations. Section 7 examines the contributions of differences in spending within and between states to differences in overall spending across quintiles of child poverty and racial composition. Section 8 discusses implications and relates our findings to the broader literature on school finance equity.

2. Background: A brief history of school funding

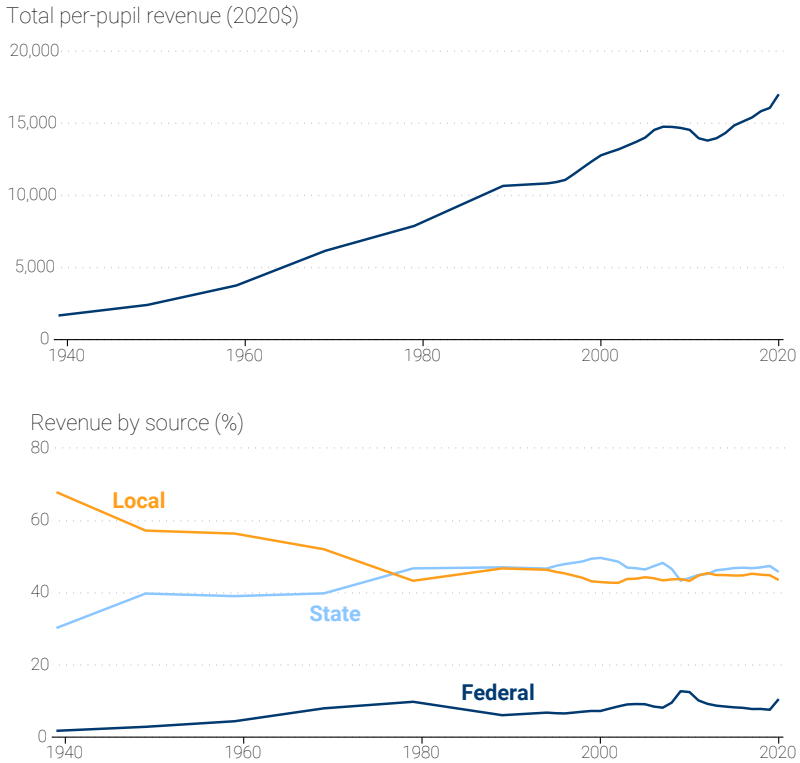
2.1. SOURCES OF SCHOOL REVENUE

Local school districts, also known as Local Education Agencies (LEAs), are the unit of government responsible for collecting revenue and allocating funding to be spent in schools.[2] School districts raise revenue locally, often through property taxes, but state and—to a lesser degree—federal governments are also important sources of funding for schools.

Figure 1 shows trends in school funding in the United States since 1940 by revenue source.[3] Adjusted for inflation, per-pupil funding has generally increased over time. The reasons for rising spending are not fully understood, and the research on this question is outdated; declining student-teacher ratios, increased spending on special education, and increasing teacher salaries have all played some role (Hanushek and Rivkin 1997), although some more recent reports suggest teacher salaries have not been rising in recent decades (Aldeman 2025). Other studies point to growing costs for health and pension benefits (Smith and Campbell 2025; Zeehandelaar and

FIGURE 1

Trends in revenue to local school districts



Source: National Center for Education Statistics (NCES).
Note: Total per-pupil revenue is adjusted to 2020 dollars using CPI-U.

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Winkler 2013) and non-teaching staff (Scafidi 2017). During recessions, school spending tends to stagnate along with states' tax revenue, and during the Great Recession, average per-pupil spending even fell substantially. Historically, schools were financed primarily with local property taxes, though this varied across states. Over time, the contribution of state governments has increased.[4] In 1940, 68% of school districts' revenue was from local taxes and 30% from the state, with just 2% coming from the federal government. Since around 1980, state and local governments have contributed about equally, with some cyclical fluctuations.

The federal contribution has always been relatively small, but it increased substantially in 1965 with the introduction of Title I of the Elementary and Secondary Education Act (ESEA), which provides funding to districts with high shares or numbers of students living in poverty.[5] Starting in 1975, the Education for All Handicapped Children Act (EAHCA), later renamed the Individuals with Disabilities Education Act (IDEA), provided additional federal funding for students with disabilities. During the Great Recession and especially during the COVID-19 pandemic, the federal government provided temporary aid, which increased the federal share. After the expiration of the Elementary and Secondary School Emergency Relief (ESSER) Funds, which provided additional aid during the COVID pandemic, the federal share has since declined and is expected to return to historical levels near 10% or below. Although the federal share of funding for schools is small, on average, federal funding benefits high-poverty districts more and accounts for a substantial share of revenue in some districts.

2.2. THE CENTRAL AND INCREASING ROLE OF STATES

In the last half century, most states have changed their school finance systems, sometimes multiple times and often at the behest of a court. School finance reforms are often credited with causing an increase in the share of school district revenue contributed by the state, but the trend toward more state and less local funding for schools largely predates the school finance reform era, which started in the 1970s. In 1970, the local and state contributions were 52% and 40%, respectively; by 1980, the state contribution was larger than the local contribution, on average.

On average, state governments now provide about as much support as school districts raise locally. It is worth noting, though, that school finance systems vary dramatically across states, and some states—especially in the South—had low average local shares at least as far back as 1960 (Reber 2011; Cascio, Gordon, and Reber 2013). The contribution to school district revenue is an incomplete measure of a state's role because states also determine how school districts are organized and decide what local taxes are required, prohibited, or optional. States not only send funding to school districts but they may also require districts to levy certain taxes or limit how much they are allowed to raise locally. All these policies influence the distribution of school spending.

Several studies have looked at the effects of these reforms (Jackson, Johnson, and Persico 2016; Lafortune, Rothstein, and Schanzenbach 2018). The effects of school finance reforms on both spending and outcomes are heterogeneous, depending on the type of reform and other factors (Jackson and Mackevicius 2024; Shores, Candelaria, and Kabourek 2023). On average, spending increases induced by school finance reforms improve student test scores and educational attainment, especially for disadvantaged students, although the effects are arguably small (Handel and Hanushek 2023; Jackson and Mackevicius 2024; Reber and Goodman 2025).[6]

2.3. WITHIN- AND BETWEEN-STATE VARIATION IN SPENDING

These studies—and much of the policy discussion about school funding—typically focus on the distribution of funding within states, but differences in average spending across states are an important source of inequality in spending overall (Reber and Goodman 2025; Corcoran et al. 2003; Gordon and Reber 2023a). There is some logic to the within-state emphasis: State governments are important actors and typically have obligations under state laws to provide for the education of children living in the state, and state policy can only influence the distribution of taxes and spending across districts within the state. Further, after the U.S. Supreme Court ruled that there is no right to education under the U.S. Constitution in the Rodriguez case in 1973, school finance litigation and policy have focused on state policies and the distribution of spending across districts within states.

In this report, we examine variation in spending across all districts, regardless of what state they are in. We return to the role of the states and decompose spending differences into their within- and between-state components in Section 7.

3. Data and approach

3.1. OVERVIEW OF THE DATA

To understand how school spending has changed for different types of school districts, we compiled school-district level data on spending, child poverty rates, and the racial composition of enrollment for all the available years since 1976 (the 1976-77 school year; going forward, we refer to school years by the fall).

Even the basic variables we use in this analysis—school spending, poverty rates, and racial composition—are not straightforward to measure at the school-district level, especially in the older data. We provide an overview of the data here and refer the reader to Appendix B for data sources and other details about how we constructed the dataset covering almost half a century.

3.2. MEASURING SPENDING, POVERTY, AND RACIAL COMPOSITION

We focus on per-pupil expenditure for current operations ("current expenditure") to track school funding. This measure excludes spending for capital investments and debt service, so we do not capture inequality in that aspect of spending.[7] Outliers in data on total expenditure due to the lumpy nature of capital expenditure and debt service can cause a handful of districts to skew the findings.[8] Expenditure for current operations provides a good indication of the resources available in schools.[9] We adjust for inflation to 2020 dollars and refer to this as "per-pupil spending" or "spending" throughout.

We are interested in how spending differs depending on two characteristics: the child poverty rate and the racial composition of enrollment. We also ask whether spending increased

more—or less—depending on these same characteristics. For racial composition, we use the non-white share of enrollment, though the findings are similar if we instead use the share of enrollment that is American Indian/Alaska Native (AI/AN), Black, or Hispanic (grouping white and Asian American and Pacific Islander (AAPI) together).

3.3. CONSTRUCTING QUINTILES OF POVERTY AND RACIAL COMPOSITION

For each district characteristic, we divide districts into five quintiles, weighted by enrollment; that is, each quintile includes districts covering 20% of national enrollment. Districts vary dramatically in size, from less than a dozen to around 1 million in the New York City school district, so the number of school districts in each quintile is not equal.[10] Districts are ranked nationally rather than within each state, in contrast to prior causal studies focused exclusively on within-state differences that rank districts by income or racial composition within states (Lafortune, Rothstein, and Schanzenbach 2018; Rauscher and Fiel 2025); the distinction matters particularly for racial composition, since some states do not have districts covering all the non-white share quintiles.

Several issues complicate the construction of quintiles and following districts over time. First, the annual measures are subject to substantial measurement error, especially for the child poverty rate. This can cause districts to move between quintiles year-to-year, making it difficult to interpret trends.[11] Assigning districts to quintiles based on averages over multiple years can address the measurement error, but the poverty rate and racial composition of a district can change over time, especially over the long period covered by this study. A district that is high-poverty in 1976 might look quite different by 2021. Second, district boundaries can also change over time. Most commonly, districts merge to take advantage of economies of scale, but sometimes districts split, or boundaries change in more complicated ways.

We tested several approaches to balancing these trade-offs. We divide the sample into three overlapping 20-year periods: 1976-1996, 1991-2011, and 2001-2021. Within each period, we limit the sample to districts that did not change their boundaries.[12] We assign them to quintiles according to their average poverty rate and racial composition, respectively, over that period. An alternative approach where we construct a longer balanced panel covering 1976-2021 shows similar findings, but we lose many districts from the analysis due to changing boundaries or missing data.

We label the three 20-year ranges the “equity era,” “adequacy era,” and “21st century,” respectively, though there is no bright line between the equity and adequacy eras, and the adequacy era arguably continues through the present. These labels refer to the dominant legal theory underlying school finance litigation in each period, not to observed outcomes. In fact, our findings below suggest that spending became less equitable during the equity era.

3.4. ILLUSTRATING THE APPROACH: 1976 AND 2020

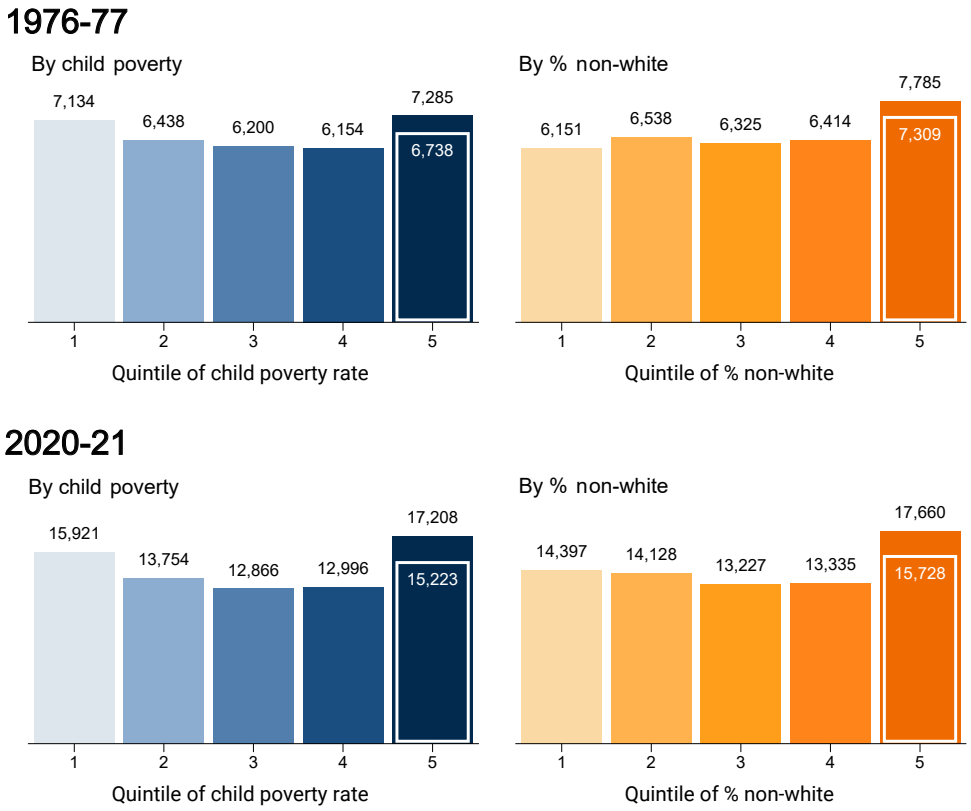
Before turning to trends over time, Figure 2 shows how average per-pupil spending varied by quintiles of child poverty and racial composition for 1976 and 2020. The former is the first year available in the data; the latter predates the bulk of the emergency federal funding for the pandemic. Because New York City (NYC) is a spending outlier and enrolls so many students, it has a large effect on the average spending in its quintile. The white outline shows the average spending for each quintile, excluding NYC. We discuss the implications of this further below.

The pattern of spending across quintiles was remarkably similar in 1976 and 2020, though the level of spending approximately doubled after adjusting for inflation—note that the top and bottom panels of Figure 2 are on different scales. The relationship between the child poverty rate and spending was U-shaped, with the lowest- and highest-poverty districts spending more than the middle quintiles. In both years, spending was highest for the top quintile of non-white enrollment share; by 2020, spending was modestly U-shaped with respect to non-white enrollment share. Figure A1 in Appendix A shows the 2020 comparison adjusted for the Comparable Wage Index for Teachers (CWIFT), discussed further below.

The influence of NYC on the findings raises a question for the rest of the analysis: Given its outlier status, how should we treat it? On the one hand, we do not want to exclude NYC from the analysis just because it is a high-spending outlier—that would understate the average spending experienced by students in NYC's quintile. On the other hand, NYC is clearly different and including it in the analysis could mask low spending among other districts with similar poverty or racial composition to NYC. We therefore include both when possible, so the reader can understand the influence of NYC on the results.

FIGURE 2

Average per-pupil spending, adjusted for inflation (2020$)



Notes: White outlined bar is the quintile average excluding New York City. Per-pupil spending is current expenditure per-pupil, adjusted to 2020 dollars using CPI-U. Districts are assigned to quintiles based on the average child poverty rate and % non-white during the "equity era" and "21st century" for the top and bottom panels, respectively; see the data appendix for details.

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3.5. WHY WE REPORT UNADJUSTED SPENDING

Our spending measures are adjusted for inflation but not for regional differences in prevailing wages. The Comparable Wage Index for Teachers (CWIFT) was developed by the National Center for Education Statistics (NCES) to measure differences in the cost of hiring teachers and other college-educated workers across places. Since a large share of districts' budgets is spent on staff, adjusting current expenditure using CWIFT facilitates comparisons across districts in what districts can buy with their spending—in terms of staffing, at least.[13] Figure A1 shows that the pattern across poverty quintiles is quite similar after adjusting for CWIFT, but the adjustment reduces the advantage of predominantly non-white districts. This is because predominantly non-white districts have above-average CWIFT values—meaning wages for college-educated workers are higher. See Appendix C for a more detailed discussion of this issue.

Both adjusted and unadjusted measures are relevant for assessing spending equity; we care not only how much districts have to spend but also how much staffing and other inputs they can buy. We therefore analyze both, but we focus in our main report on unadjusted averages for several reasons.[14] First, the CWIFT measures are only available starting in 2013 (its predecessor began in 1997), but our analysis starts much earlier, in 1976.[15] Also, other factors besides prevailing wages affect how much a district can accomplish with a given level of spending. For example, smaller or rural districts don't benefit from economies of scale and often face higher transportation costs, but CWIFT does not account for those and other differences. Finally, CWIFT-adjusted gaps are prone to misinterpretation. For example, systematic spending gaps are often attributed to local property tax base inequality. But when spending is adjusted for CWIFT, gaps may be driven by differences in input prices rather than revenue gaps. Overall, the unadjusted average is more straightforward to interpret—it is what the district spent. We report unadjusted averages in the main report and CWIFT-adjusted versions of our key figures in Appendix A.

In the next two sections, we analyze how spending evolved between the two points shown in Figure 2, revealing that these basic patterns hold throughout, though the magnitude of the differences across quintiles varies.

4. Trends by poverty rate

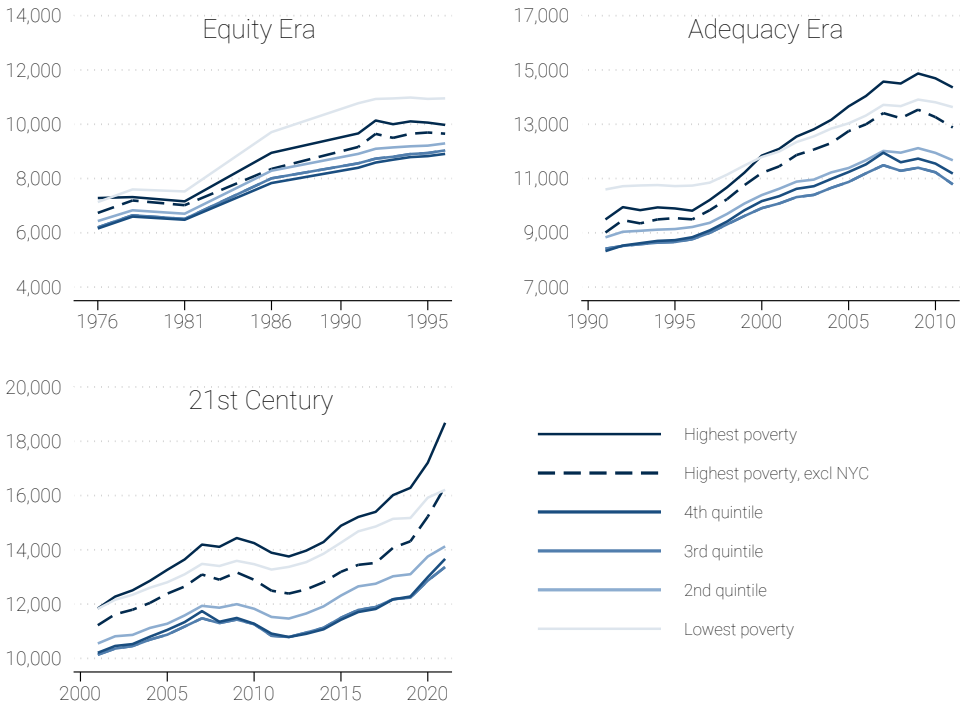
4.1. SPENDING GREW SUBSTANTIALLY FOR ALL CHILD POVERTY QUINTILES

Figure 3 shows trends in average spending by quintile of the child poverty rate for the three overlapping 20-year periods described above. Average spending increased substantially over the whole period for all poverty quintiles, ranging from about $6,000 to $7,300 in 1976 and $13,000 to $19,000 in 2021. Growth in per-pupil spending generally slowed or reversed in recessions, especially the Great Recession. Because spending adjusted for inflation has more than doubled over this period, we shift the range of the vertical axis up for later periods. Note, though, that the range is always $10,000 so the slopes and distances between the lines are comparable across panels.

The points plotted for 1976 and 2020 are the same as the upper-left and lower-left panels of Figure 2, respectively. The lines show how average spending in each quintile evolved in the intervening years.[16]

FIGURE 3

Inflation-adjusted per-pupil spending by child poverty rate quintile



Notes: See the data appendix for details.

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4.2. A PERSISTENT U-SHAPE: HIGHEST- AND LOWEST-POVERTY DISTRICTS SPENT MORE

Spending by poverty quintile maintained the U-shape shown in Figure 2 across the full period we study. That is, the lowest-poverty (lightest blue) and highest-poverty (darkest blue) lines are both higher than the other three lines, indicating the highest- and lowest-poverty quintiles spent more than the middle quintiles in every year. Within that persistent pattern, the relative positions of the top and bottom quintiles shifted over time. During the "equity era," the low-poverty side of the U pulled ahead: In 1976, the highest- and lowest-poverty districts spent about the same, but over the next two decades, spending in the lowest-poverty districts increased faster. By the early 1990s, the lowest-poverty quintile spent about 10% more than the highest-poverty quintile.

4.3. AFTER 2000, THE HIGHEST-POVERTY DISTRICTS PULLED AHEAD

Starting around 1995, spending in the highest-poverty districts increased faster than for any other quintile, and by the turn of the millennium, the highest- and lowest-poverty districts spent about the same amount, on average. This period of rapid growth in spending by the poorest districts roughly corresponds to the "adequacy era" of school finance reforms. In 2007, on the eve of the Great Recession, the highest-poverty districts spent about 5% more than the lowest-poverty districts and about 25% more than the middle-quintile districts, which had spending levels similar to each other.

4.4. THE GREAT RECESSION HIT HIGH-POVERTY DISTRICTS HARDEST

The third panel shows that the Great Recession, which started in late 2007, hit school spending hard, though an infusion of federal funding helped stave off declines for a couple of years. Average spending declined in all quintiles after 2009 and took several years to recover after the recession was over. While spending in the second to the fifth quintiles fell by around $500-$700 per student, students in the lowest-poverty districts only faced spending cuts of a little more than $200. Average spending in the highest-poverty districts didn't fall below that of the lowest-poverty districts, but high-poverty districts experienced larger cuts. In recent years, spending in the highest-poverty districts increased the most. The substantial disproportionate increase for the highest-poverty districts in 2021 was due in part to the infusion of emergency pandemic funding from the federal government through the Elementary and Secondary School Emergency Relief (ESSER) programs.

The larger impact of the Great Recession on school spending relative to earlier downturns could be due to the depth and length of the recession but also increased reliance on state funding among higher-poverty districts. State budgets were hit hard by the Great Recession, and research shows that local property tax revenues were steadier, even though a housing crisis—and declining property values—precipitated the Great Recession. However, that research is based on only a handful of states (Evans, Schwab, and Wagner 2019).

5. Trends by racial composition

5.1. THE HIGHEST NON-WHITE SHARE DISTRICTS SPENT THE MOST SINCE 1976

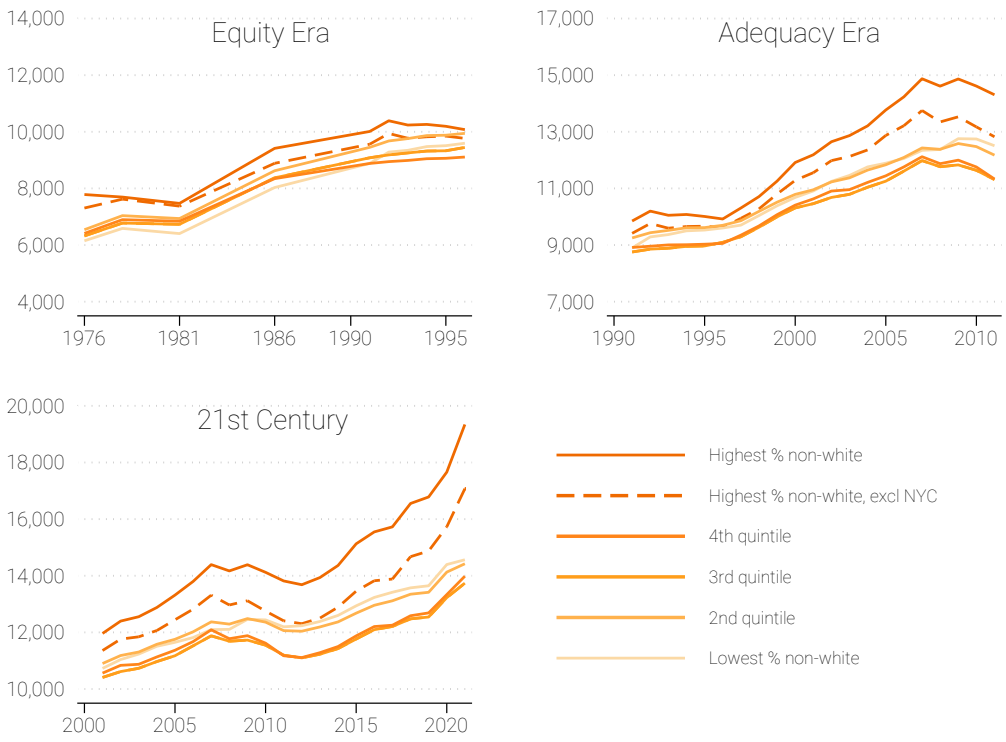
Figure 4 shows trends by quintiles of the percent of enrollment that is non-white. Districts with the highest non-white percentage had higher per-pupil spending than other districts across all three panels, though the magnitude of the difference was smaller in earlier years or if NYC is excluded.

5.2. AFTER THE LATE 1990S, THE TOP QUINTILE PULLED AWAY

Before the late 1990s, trends were similar across quintiles, but as for the trends by child poverty shown in Figure 3, average spending for the top quintile increased faster compared to the other quintiles starting in the late 1990s. Again, spending growth in NYC was responsible for some, but not all, of this trend.

FIGURE 4

Inflation-adjusted per-pupil spending by percent non-white enrollment quintile



Notes: See the data appendix for details.

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5.3. RECESSIONS AFFECTED SPENDING IN PREDOMINANTLY NON-WHITE DISTRICTS MORE

As for high-poverty districts, the Great Recession hit predominantly non-white districts harder than districts with a lower share of non-white students. More generally, spending in the top non-white quintile converged somewhat with spending among lower non-white share quintiles during recessions—around 1981, the early 1990s, and the Great Recession. (The early 2000s recession was shallow and appears not to have affected school spending.)

5.4. DISTRICTS WITH HIGH NON-WHITE ENROLLMENT SHARE FACED HIGHER WAGES FOR COLLEGE-EDUCATED WORKERS

The spending advantage for the highest non-white share quintile is substantially reduced—and reversed in some years—if we adjust for differences in prevailing wages for college-educated workers using CWIFT (Figure A5). This is because predominantly non-white districts are concentrated in high-wage labor markets where their purchasing power is diminished by higher costs of hiring staff. CWIFT-adjusted gaps, which more closely map to gaps in what districts can buy, often favored predominantly white districts in earlier years. In more recent years spending in predominantly non-white districts exceeded that in predominantly white districts even after adjusting for CWIFT. This is different from the results by poverty rate, where adjusting for CWIFT indicates that the purchasing power advantage of higher-poverty districts is larger than the unadjusted spending difference (see Figure A2).[17]

6. Why our findings seem to differ from some reports from advocacy organizations

The findings presented so far may appear to contradict prominent reports on school funding equity that suggest that predominantly non-white and high-poverty school districts receive less funding. For example, the widely cited EdBuild "$23 billion" report (EdBuild 2019) concludes that "predominantly white school districts get $23 billion more than their nonwhite peers"—or about $2,200 per pupil—and that "we now have a system where wealth is preserved for the lucky—disproportionately fractured and locked away in racially concentrated white school districts." By (seeming) contrast, we find that the least-white districts spent substantially more than the whitest districts.

Two differences between our analysis and EdBuild's explain most of the disconnect. First, EdBuild adjusts for regional cost-of-living differences while we present unadjusted averages in the main report (for the reasons discussed in Section 3).[18] EdBuild's analysis is therefore more comparable to our CWIFT-adjusted findings in Figure A5, which show similar spending for the first and fifth quintiles of non-white enrollment share in the year EdBuild analyzes (2015). As noted above, adjusting for CWIFT substantially reduces the advantage of predominantly non-white districts.

Second, they consider state and local revenue, whereas we analyze current expenditure[19], including spending from federal revenue, which disproportionately benefits predominantly non-white districts.[20]

There are other smaller differences between EdBuild's approach and ours, but these two—the focus on state and local revenue instead of a measure of total resources and the adjustment for differences in wages across districts—account for most of the seemingly divergent findings. See Appendix C for a replication of the EdBuild analysis and a fuller accounting of the differences between our analysis and theirs.

A report from the Education Trust similarly concludes that "the highest poverty districts in our country receive about $1,000 less than the lowest poverty districts" and points to a gap of about $1,800 per student between districts serving the most and least students of color. That analysis also only includes state and local revenue in their definition of "funding" (Morgan and Amerikaner 2018) as in the "$23 billion" report, which likely explains the seeming divergence in findings.

A separate strand of research highlights "funding gaps," including work comparing actual spending to estimates of what districts need to achieve specified educational goals based on "adequacy models" (Baker et al. 2018; Baker 2023). These studies generally conclude that high-poverty districts have less funding than adequacy models suggest they need. Estimating how much it would cost to provide an "adequate" education is both conceptually and empirically difficult, and critics have noted significant problems with adequacy models (Costrell, Hanushek, and Loeb 2008). Nevertheless, the intuition that high-poverty districts need more per-pupil funding than low-poverty districts to meet the same educational goals is sound. Our finding that high-poverty districts spend the most in absolute terms is certainly consistent with the idea that they may not have enough funding to serve students well.

As discussed above, our goal is to show how spending has varied across districts with different characteristics and over time, adjusting only for inflation, to provide a clear picture of actual resource distribution rather than assessments of adequacy or equity relative to estimated needs.

7. The role of states

Above, we present trends in spending averaging across districts, regardless of what state they are in. But average per-pupil spending varies considerably across states and is strongly correlated to the state's tax base (Gordon and Reber 2023a). Across the years covered by our analysis, more than half the variation in per-pupil spending was between rather than within states (Corcoran and Evans 2015; Murray, Evans, and Schwab 1998; Reber and Goodman 2025).

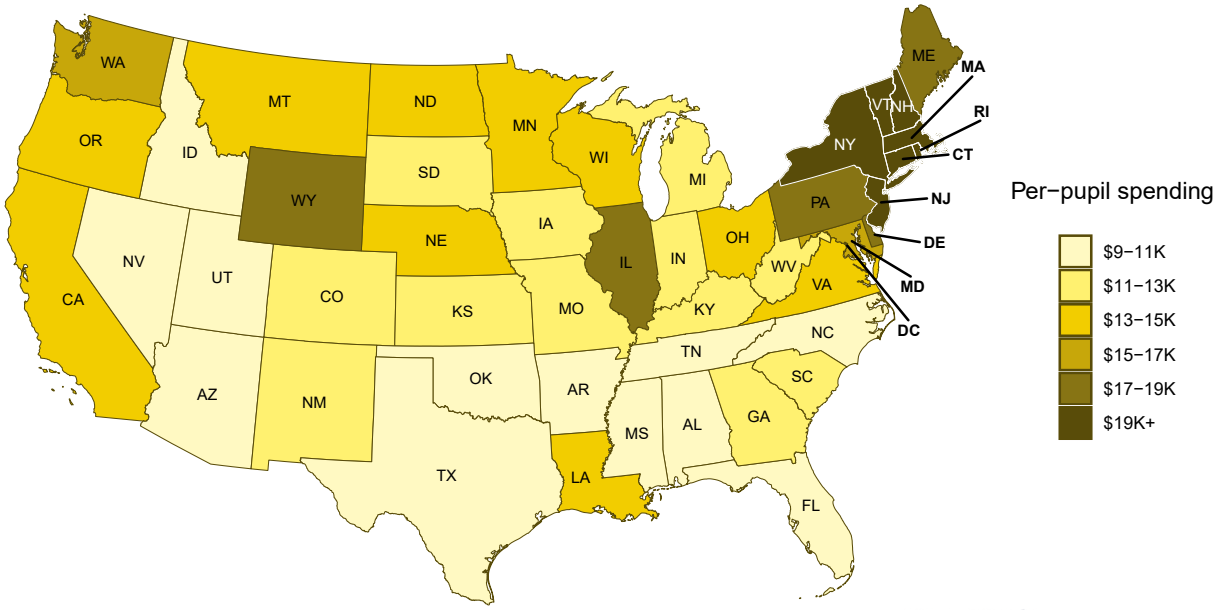
In this section, we ask whether the trends we document above are due to between- or within-state changes in spending. It could be the case, for example, that average spending in the highest-poverty districts increased more after 1995 because those districts are concentrated in states where spending increased more or because they "moved up" in their state, i.e., their per-pupil spending increased relative to other districts in the same state (and similarly for racial composition). In this section, we walk through the analysis by child poverty quintile in some detail and then present the analysis for racial composition.

7.1. HIGH- AND LOW-POVERTY DISTRICTS ARE SPREAD ACROSS STATES

Before we show the decomposition, it is useful to have a sense of the geographic distribution of high- and low-poverty districts and of high- and low-spending states. Figure 5 shows how average spending varied across states in 2020, ranging from about $9,000 per pupil in the lowest spending states to almost $30,000 in the highest spending states. Figure 6 maps school districts, showing the geographic distribution of school districts by quintile of the child poverty

FIGURE 5

Average per-pupil spending, 2020–21



Notes: The figure shows average current expenditure per pupil, weighted by enrollment.
Source: U.S. Census Bureau.

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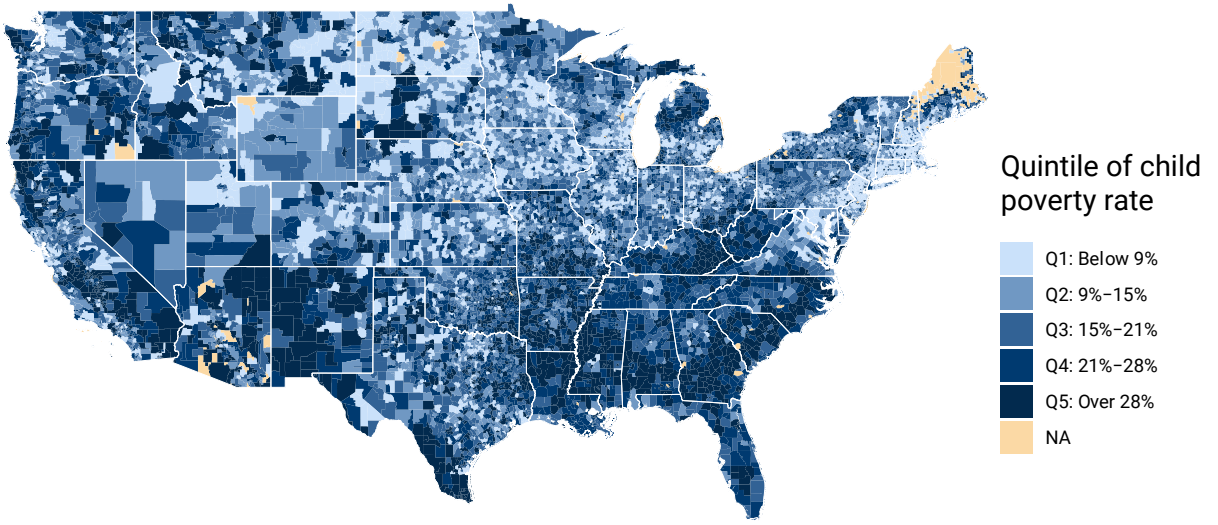
FIGURE 6

Child poverty rate quintile by school district



Notes: Districts are assigned to child poverty rate quintiles based on the average between 2010 and 2022. School district boundaries are for 2019-20.
Source: U.S. Census Small Area Income and Poverty Estimates (SAIPE); National Center for Education Statistics (NCES) Education Demographic and Geographic Estimates (EDGE).

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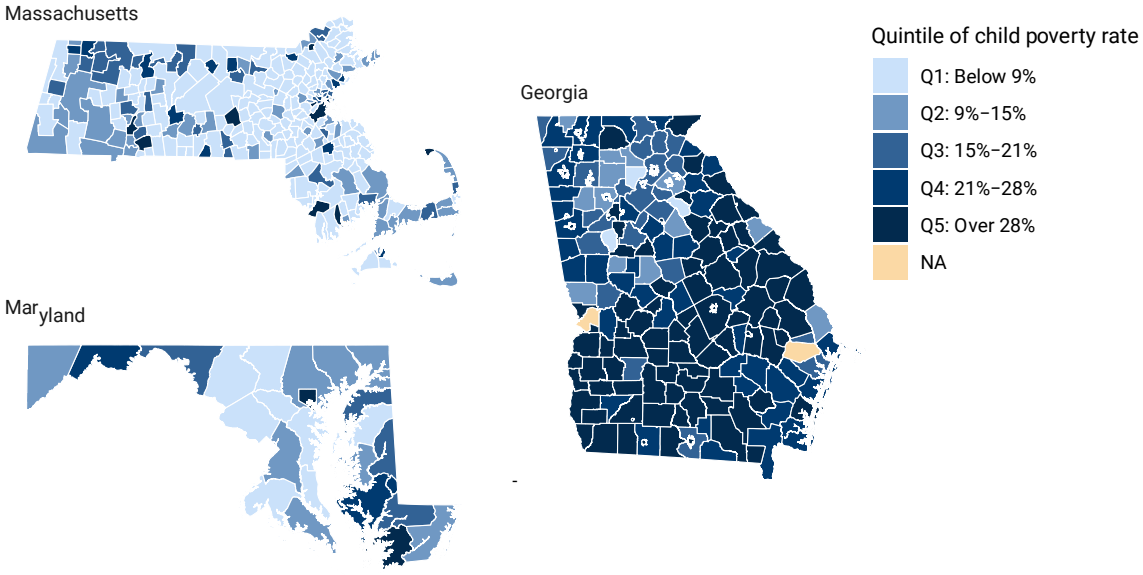
FIGURE 7

Child poverty rate quintile by school district, selected states



Notes: Districts are assigned to child poverty rate quintiles based on the average between 2010 and 2022.
Source: U.S. Census Small Area Income and Poverty Estimates (SAIPE); National Center for Education Statistics (NCES) Education Demographic and Geographic Estimates (EDGE).

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rate.[21] There is some geographic correlation between average spending and the child poverty rate. For example, both high-spending states and low-poverty districts are concentrated in the Northeast. However, there are higher- and lower-spending states and higher- and lower-poverty districts throughout the United States.

Nearly all states have at least some school districts in each poverty category, though states with higher average incomes and school spending have fewer high-poverty districts and vice-versa. This is difficult to see on the national map, so Figure 7 shows Georgia, Maryland, and Massachusetts in more detail. Georgia, which has moderate per-capita income and average school spending, is home to many high-poverty school districts (the darkest blue) but also has districts in all the quintiles, including the lowest-poverty category. Massachusetts has higher average spending and per-capita income compared to Georgia. Most districts in Massachusetts are in the lowest child poverty quintile, but again, all the quintiles, including the highest-poverty quintile, are represented. In Maryland, districts are countywide so they are less fragmented, and again, both high- and low-poverty districts are present.

If all the low-poverty districts were in the richest, highest-spending states, decomposing changes in spending within and between states would not be informative. But that is not the case. Instead, low- and high-poverty districts are distributed across states.[22] At the same time, some states have much higher average spending than others. In the remainder of this section, we analyze whether the differential trends observed above—especially the relative increase in spending for the highest-poverty districts after 1995—were due to those districts being in states that increased spending more or to increases in spending relative to the average in their state.

7.2. DECOMPOSING SPENDING INTO OWN-STATE AVERAGE AND WITHIN-STATE DIFFERENCE

To decompose differences in average spending between quintiles into their between- and within-state components, we first assign each district the average spending in its state, which we refer to as the "own-state average." Then we subtract the own-state average from spending for each district, which we refer to as the "within-state difference." Each district's spending is, by definition, equal to its own-state average plus its within-state difference.

To illustrate how we calculate the within- and between-state contributions to differences in average spending across child poverty quintiles, we walk through the decomposition for the spending difference between the first and fifth quintiles for 1976, 1995, and 2020 in Table 1.

In 1976, average spending was $7,285 and $7,134 in the highest- and lowest-poverty districts, respectively, corresponding to the first panel of Figure 2 and the 1976 values plotted in Figure 3. The difference between spending in the highest- and lowest-poverty districts was $152 (row 3).

The between-state contribution to that difference is -$465 (row 4). That means, if every district spent exactly its own-state average, high-poverty districts would have spent $465 less than low-poverty districts, on average. That is, high-poverty districts were disproportionately in lower-spending states.

TABLE 1

Decomposition of difference in spending between highest- and lowest-poverty districts

	1976	1995	2020
Highest-poverty average	$7,285	$10,061	$17,208
Lowest-poverty average	$7,134	$10,937	$15,921
Highest (Q5) – Lowest (Q1) Gap	**$152**	**-$876**	**$1,287**
Between-state	-$465	-$904	-$1,084

SOURCE: Authors' calculations.
NOTE: Totals may not add due to rounding.

The within-state contribution is $617 (row 5), indicating that spending was progressive within states. The within-state gap favoring high-poverty districts more than offset the between-state gap favoring low-poverty districts. Note that, by definition, the between- and within-state contributions add up to the gap in row 3 (-$465 + $617 = $152).

Notably, the distribution of school spending became less equitable during the "equity era": In 1995, the gap between the highest- and lowest-poverty districts had reversed, with the latter spending $876 more than the former (column 2). The (negative) between-state contribution increased to -$904, and that was only slightly offset by higher spending among the poorest districts within states ($27, a much smaller offset than that calculated in 1976). The decomposition shows that both between-state and within-state differences shifted toward more regressive spending patterns between 1976 and 1995.[23]

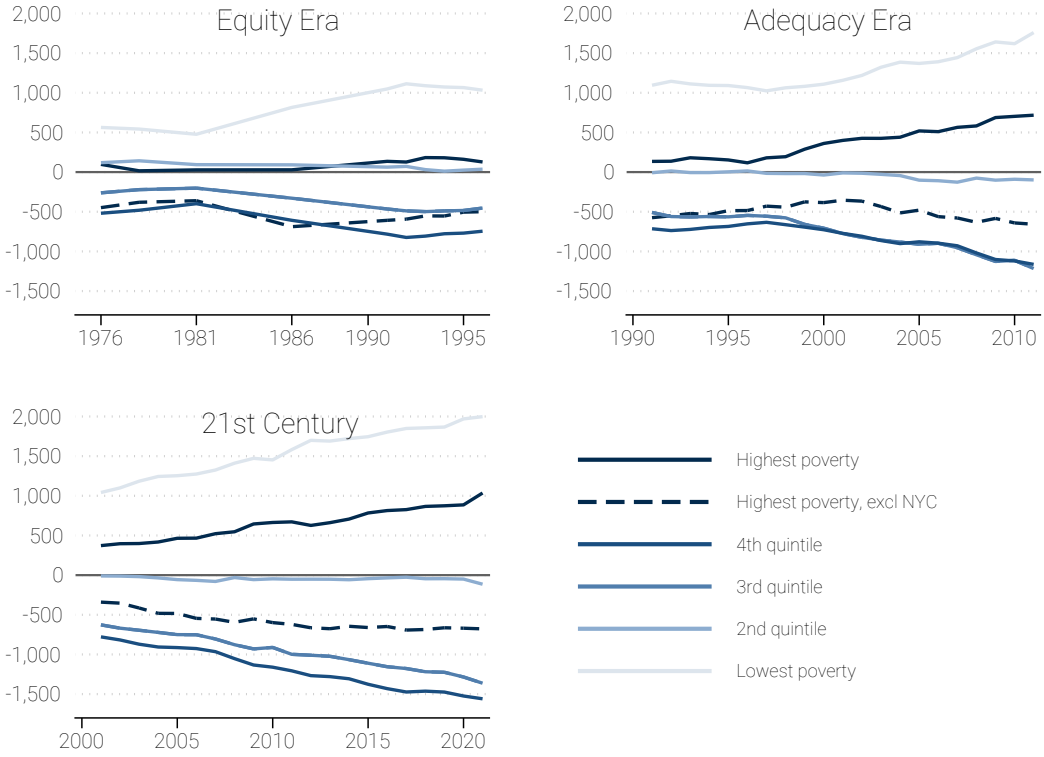
By 2020, the direction of the gap again reversed and widened substantially: Average spending for the highest-poverty districts was $17,208, compared to $15,921 for the lowest-poverty districts, a difference of $1,287. If every district spent at its own-state average, that gap would have been $1,084 in the other direction. Within states, highest-poverty districts spent $2,371 more, on average, compared to their lowest-poverty counterparts. Figures 8a and 8b show how the between- and within-state contributions to differences in spending evolved over time for all quintiles.

7.3. HIGH-POVERTY DISTRICTS ARE IN LOWER-SPENDING STATES ON AVERAGE

Figure 8a plots the detrended own-state average by quintile. That is, we subtract the year-specific national average spending from the own-state average described above—this makes it easier to see relative changes across quintiles. Positive values indicate that, on average, districts in that quintile are in states with higher-than-average spending; a positive slope means districts in the relevant quintile were in states where spending increased faster than average. For example, the lightest-blue line is always positive and increasing, indicating that lowest-poverty districts are consistently in states where spending is above average and growing faster than average. After about 1995, that is also true for highest-poverty districts (though not if New York City is excluded[24]).

FIGURE 8A

Between-state contribution: Average own-state per-pupil spending



Notes: Each district is assigned the average, demeaned per-pupil current expenditure in its state; figure plots the average by quintiles of child poverty. Positive values indicate that districts in that quintile are in states that have higher average spending. See the data appendix for details.

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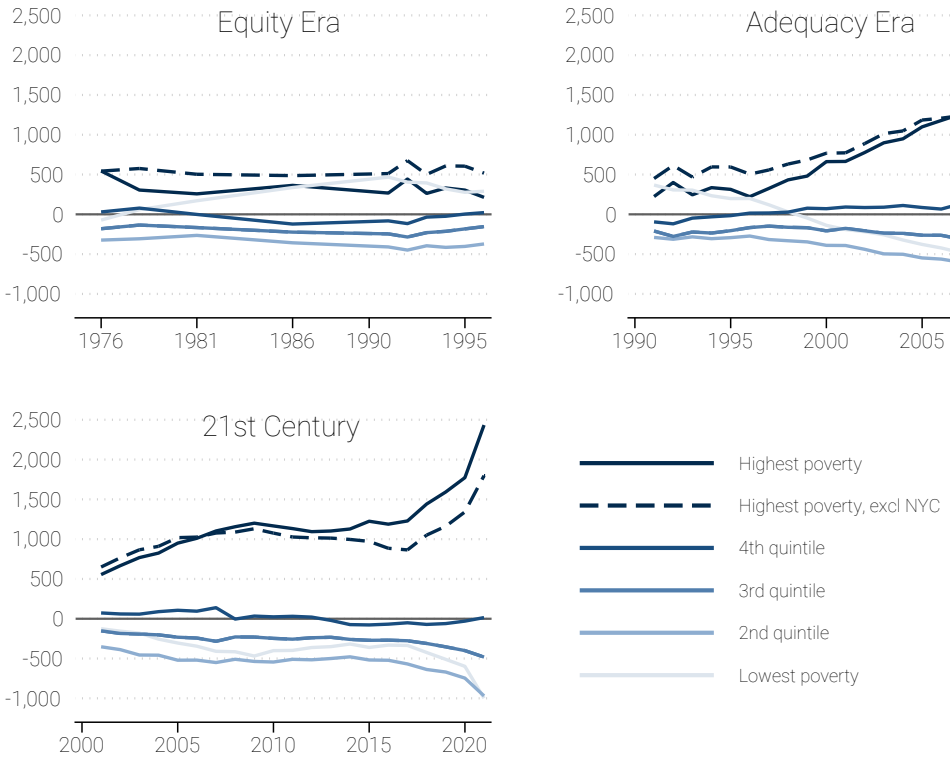
7.4. WITHIN STATES, SPENDING BECAME SHARPLY MORE PROGRESSIVE AFTER 1995

Figure 8b shows how the within-state component of spending varied by poverty quintile and evolved over time. Positive values mean that districts in that quintile spent more than the average in their own state and vice-versa. Before the mid-1980s, high-poverty districts spent more than low-poverty districts in the same state, but low-poverty districts moved up the ranks within states in the early 1980s. Between the mid-1980s and mid-1990s, the highest- and lowest-poverty districts both spent about $400-$500 more than the average in their state (spending was U-shaped). Starting in the mid-1990s, spending in the highest- and lowest-poverty districts diverged sharply within states. By 2020, the

FIGURE 8B

Within-state contribution: Average deviation from own-state average per-pupil spending



Notes: Deviation from own-state average is the difference between per-pupil current expenditure and the average in the district's state; figure plots the average by quintile. Positive values indicate districts in that quintile have above-average spending within their state. See the data appendix for details.

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gap favoring high-poverty districts grew to almost $2,400 (as shown in Table 1) and was even larger in 2021. Middle-poverty districts spent near or below their own-state average consistently.

These figures reveal another trend: Comparing the highest- and lowest-poverty districts can understate the importance of between-state differences in explaining average spending gaps. For example, spending for districts in the fourth quintile of child poverty (poor, but not the poorest) was close to the own-state average throughout the entire period (Figure 8b). And the average own-state spending gaps were large and increasing (Figure 8a). By 2020, the gap in own-state average between the fourth and first quintiles was about $3,500, favoring low-poverty districts. That was only offset by a roughly $500 difference in the within-state gap. That is, spending for fourth-quintile districts was much lower than for first-quintile districts largely because fourth-quintile districts are more concentrated in low-spending states.

7.5. BOTH THE WITHIN- AND BETWEEN-STATE COMPONENTS CONTRIBUTED TO SMALLER SPENDING REDUCTIONS FOR LOW-POVERTY DISTRICTS IN THE GREAT RECESSION

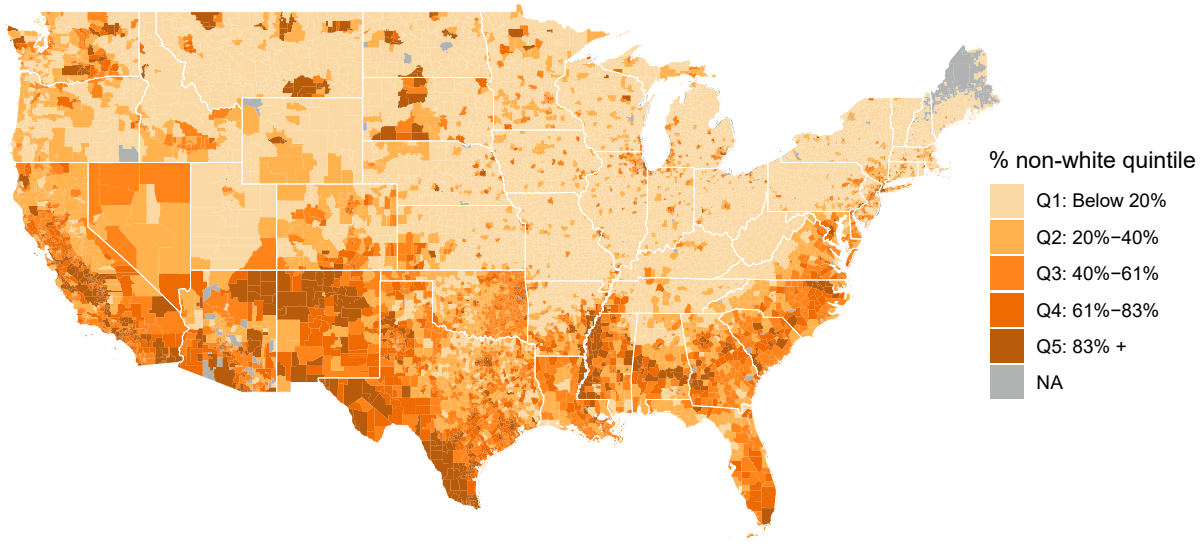
Recall from Figure 3 that low-poverty districts were largely insulated from cuts during the Great Recession (starting around 2010). The "21st century" panels show that this was both because those districts were more likely to be in states where spending increased (Figure 8a), and their spending increased (or decreased less) compared to higher-poverty districts in the same state (Figure 8b). That is, both the between- and within-state components contributed to protecting low-poverty districts from cuts during the Great Recession.

7.6. NEW YORK CITY IS AN OUTLIER MAINLY BECAUSE IT IS IN A HIGH-SPENDING STATE

New York City complicates the story somewhat, so it is worth understanding why it is such a high-spending outlier. NYC is in New York state, which had higher-than-average spending throughout the period we study; that was the primary reason for its outlier status throughout, though the within-state component became more important in the last decade or so. Before the 1990s, NYC actually spent less than its own-state average but still had spending well above the national average (because its own-state average was high). By the 2010s, spending in NYC was well above average for New York state, which itself was nearly double the national average spending. Throughout the period we study, spending in New York state grew faster than average (from a relatively high starting point), and spending became more progressive (at least for NYC) faster than in the average state. Together these trends moved NYC from a moderate to more extreme high-spending outlier.

FIGURE 9

Percent non-white quintile by school district



Notes: Districts are assigned to % non-white enrollment quintiles based on the average between 2010 and 2022. School district boundaries are for 2019-20.
Source: U.S. Census Small Area Income and Poverty Estimates (SAIPE); National Center for Education Statistics (NCES) Education Demographic and Geographic Estimates (EDGE).

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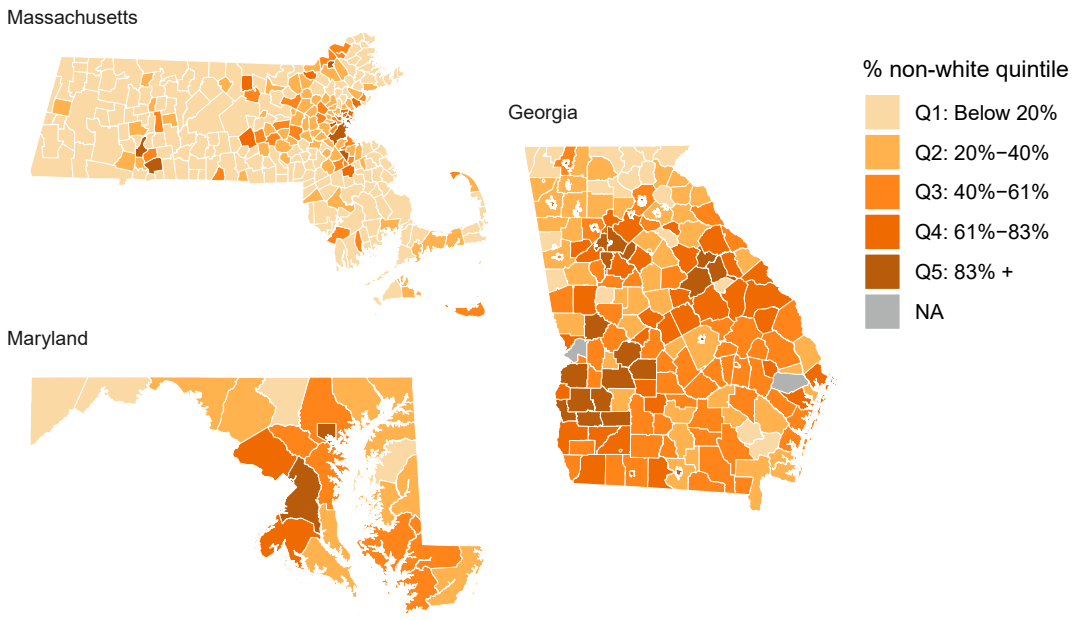
FIGURE 10

Percent non-white quintile by school district in select states



Notes: Districts are assigned to % non-white enrollment quintiles based on the average between 2010 and 2022. School district boundaries are for 2019-20.
Source: U.S. Census Small Area Income and Poverty Estimates (SAIPE); National Center for Education Statistics (NCES) Education Demographic and Geographic Estimates (EDGE).

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7.7. DISTRICTS WITH HIGHER AND LOWER NON-WHITE ENROLLMENT SHARES ARE LESS EVENLY DISTRIBUTED ACROSS STATES

Figures 9 through 11 and Table 2 repeat the analysis described above by racial composition instead of poverty. We begin by showing the geographic distribution of higher- and lower-non-white-share districts for the whole United States and selected states in Figures 9 and 10. Districts are not as evenly distributed across states by non-white share as they are by poverty rate. The highest-non-white-share districts are concentrated in the South and on the coasts, and in some states, nearly all districts are in the lowest quintile. Still, many states, including those shown in Figure 10, have districts in all five quintiles.

Table 2 shows that spending in predominantly non-white districts was consistently higher than in predominantly white districts. The trend followed a similar path as for poverty, with the distribution becoming less favorable to more disadvantaged districts (e.g., high-poverty or predominantly non-white) in 1995 and more favorable again after that.

7.8. THE BETWEEN-STATE COMPONENT IS LESS IMPORTANT FOR DIFFERENCES BY RACIAL COMPOSITION THAN FOR POVERTY

The between-state contribution to the gap in spending between the highest and lowest non-white-share districts is smaller in absolute value than in the analysis by child poverty.

TABLE 2

Decomposition of difference in spending between highest and lowest non-white share districts

	1976	1995	2020
Highest non-white-share average	$7,785	$10,194	$17,660
Lowest non-white-share average	$6,151	$9,511	$14,397
Highest (Q5) – Lowest (Q1) Gap	**$1,634**	**$683**	**$3,263**
Between-state	$355	-$314	$473
Within-state	$1,279	$997	$2,790

SOURCE: Authors' calculations.
NOTE: Totals may not add due to rounding.

Relative to predominantly white districts, predominantly non-white districts were in somewhat higher-spending states in 1976, somewhat lower-spending states in 1995, and higher-spending states by 2020. The within-state component consistently favored predominantly non-white districts (fifth quintile) and followed the same time pattern as for poverty, shrinking between 1976 and 1995 and growing after that. In 2020, predominantly non-white districts spent $3,263 more on average than their predominantly white counterparts, mostly because predominantly non-white districts had high spending relative to their own-state average.

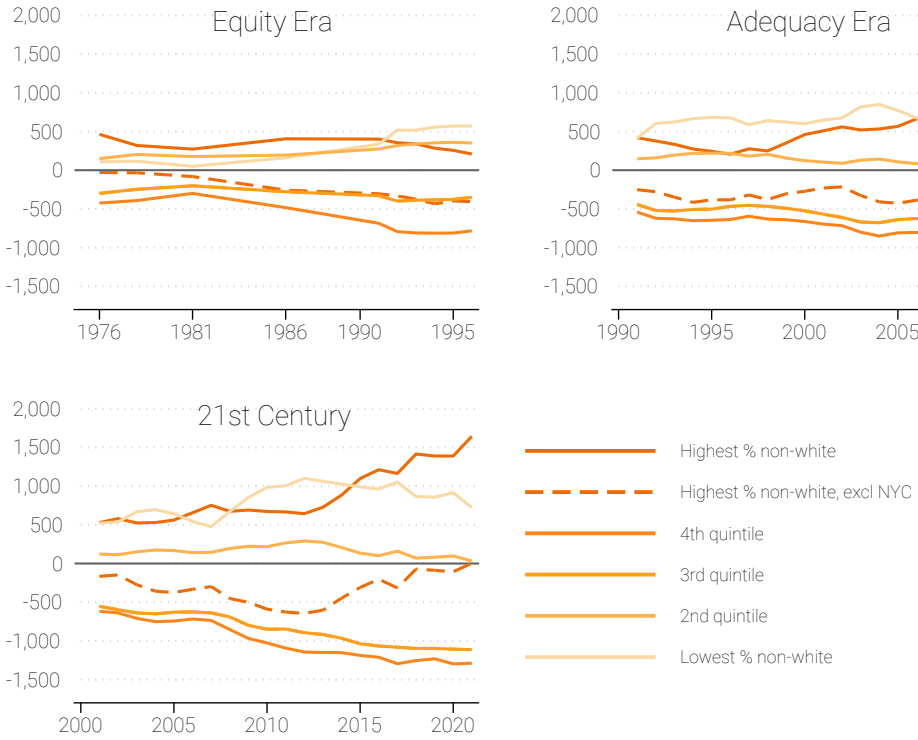
Figure 11a shows that the own-state average tends to be higher for both the highest and lowest non-white-share districts, indicating that those districts are concentrated in higher-spending states. The high own-state average for the fifth quintile is much lower excluding NYC, indicating that other predominantly non-white districts are in lower spending states on average.

7.9. WITHIN STATES, SPENDING HAS FAVORED HIGHER NON-WHITE SHARE DISTRICTS SINCE 1976

Perhaps surprisingly, within states, districts with higher non-white enrollment shares (quintiles 4 and 5) had the highest per-pupil spending, and the lowest non-white-share districts (quintile 1) had significantly below average spending throughout (Figure 11b). The average deviation of districts' spending from the own-state average was relatively constant until about 1995 for all quintiles. After 1995, the distribution of spending within states shifted considerably towards the highest non-white-share districts and away from the lowest non-white-share districts, similar to trends by poverty quintiles. In 2021, predominantly non-white districts spent $2,500 per pupil more and predominantly white districts spent over $1,000 less than their state's average, though that gap is significantly smaller if NYC is excluded and before the infusion of COVID relief funds; it is also smaller if we adjust for CWIFT (Figure A7).

FIGURE 11A

Between-state contribution: Average demeaned own-state per-pupil spending



Notes: Each district is assigned the average, demeaned per-pupil current expenditure in its state; figure plots the average by quintile of % non-white enrollment. Positive values indicate that districts in that quintile are in states that have higher average spending. See the data appendix for details.

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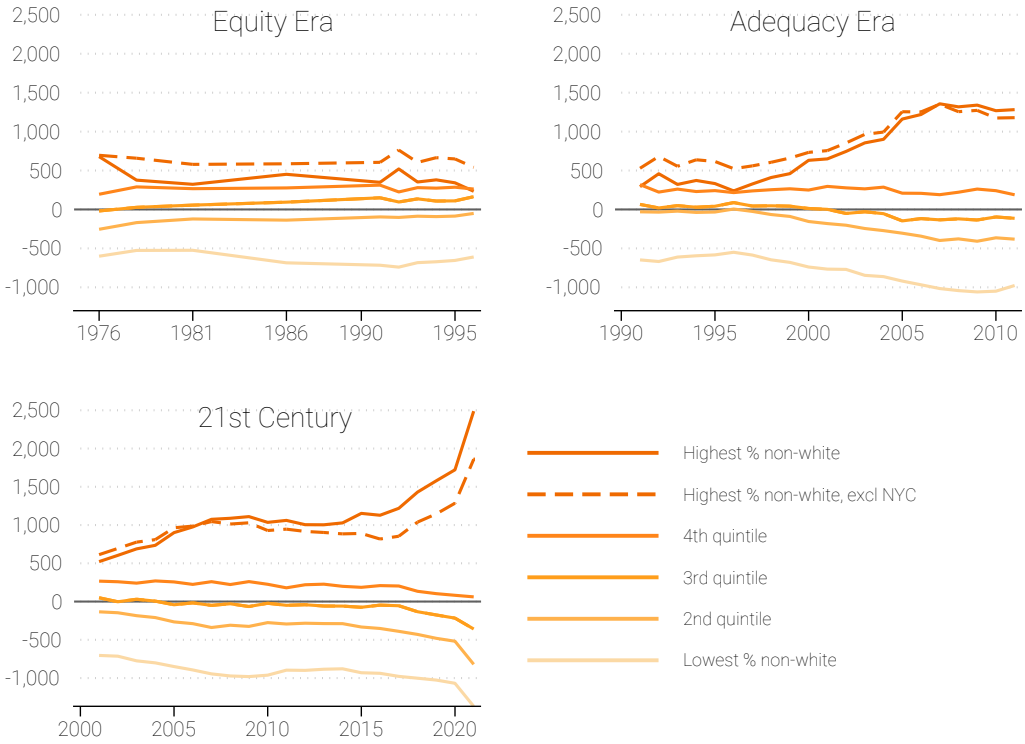
FIGURE 11B

Within-state contribution: Average deviation from own-state average per-pupil spending



Notes: Deviation from own-state average is the difference between per-pupil current expenditure and the average in the district's state; figure plots the average by quintile of % non-white enrollment. Positive values indicate districts in that quintile have above-average spending within their state. See the data appendix for details.

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8. Discussion

8.1. SCHOOLS IN HIGH-POVERTY AND PREDOMINANTLY NON-WHITE DISTRICTS SPEND THE MOST

This report documents nearly five decades of changes in school funding patterns across the United States. Our analysis shows that while per-pupil spending has grown substantially across all types of districts since 1976, the relationship between district characteristics and funding has evolved in important ways, particularly since the mid-1990s. The relationship between child poverty and per-pupil spending was U-shaped throughout the period we study, with the lowest-poverty and highest-poverty districts spending more than those in the middle. In the early years, low-poverty districts usually outspent their highest-poverty counterparts, but highest-poverty districts saw faster-than-average growth in spending starting in the mid-1990s. By 2000, high-poverty districts outspent low-poverty districts, and in 2020, high-poverty districts spent about $1,300 more per pupil than their low-poverty counterparts. Districts in the middle spent less. Adjusting for differences in input prices using CWIFT, funding patterns by poverty are generally somewhat more progressive. Districts with the highest non-white enrollment shares maintained higher spending throughout the entire period studied, although their advantage was smaller, and in some years reversed if spending is adjusted using CWIFT. Like high-poverty districts, districts with higher non-white shares also experienced disproportionate spending growth after the mid-1990s.

While these patterns demonstrate that funding has become more targeted to disadvantaged districts, we note several important limitations of our descriptive analysis. First, while we document that high-poverty and predominantly non-white districts spend more, the analysis does not speak to whether these additional resources are sufficient to address the greater educational needs of their students. Second, our analysis focuses solely on the distribution of spending; we do not examine how efficiently these resources are used or their effects on student outcomes. Third, we report averages within each quintile of child poverty and non-white enrollment share nationally, but within each quintile some spend more than others. The fact that high-poverty districts spend more on average does not imply all high-poverty districts do. Finally, while the patterns over time are quite robust, some of the findings about differences in levels of spending—especially by racial composition—are sensitive to whether we include NYC in the sample or adjust for CWIFT. We present results with and without NYC throughout and provide CWIFT-adjusted results in the appendix so readers can see for themselves.

8.2. WITHIN-STATE PROGRESSIVITY INCREASED, CROSS-STATE AVERAGE DIFFERENCES PERSISTED

We also decompose differences in spending across quintiles of child poverty and non-white enrollment share into their between- and within-state components. Between-state differences are important for understanding why spending varies across districts throughout the period we study, a fact that is well-documented even if school finance research and discussions have focused on within-state differences. Higher-poverty and higher non-white-share districts are generally located in lower-spending states, with NYC as a notable exception (as discussed above). Within states, funding was progressive with respect to non-white share since 1976;

that is, higher non-white-share districts spent more than their state average. For child poverty, spending was initially U-shaped, with the highest- and the lowest-poverty districts spending above their state average. The degree of progressivity increased dramatically during the "adequacy era" of school finance reforms that began in the 1990s. By contrast, the distribution of spending across districts within states became slightly less progressive during the earlier "equity era." The within-state patterns hold whether we exclude NYC and/or adjust for differences in input prices using CWIFT.

8.3. OUR FINDINGS ARE BROADLY CONSISTENT WITH EARLIER WORK

As discussed in more detail above and in Appendix C, some reports by advocacy organizations that appear at odds with our findings that high-poverty and predominantly non-white districts spend the most exclude federal funding, which disproportionately benefits disadvantaged districts by design, reducing the apparent spending advantage of such districts (EdBuild 2019; Morgan and Amerikaner 2018; Morgan 2022). In addition, those reports adjust funding using CWIFT (or a cost-of-living index), though this choice has different implications for the findings by racial composition and poverty. The results in those reports are therefore more comparable to the CWIFT-adjusted results we report in the appendix.

Our findings are broadly consistent with earlier academic work and help reconcile some apparent tensions in the literature. Few other studies span the full period we examine, so we discuss how our findings relate to the prior literature on school finance period by period, starting with studies of recent years and working backwards. We distinguish between descriptive studies of patterns of school funding and causal studies of the effects of school finance reforms on spending. In this discussion, we focus more on the results by poverty since there are fewer previous studies on how spending relates to the racial composition of districts, though Rauscher and Fiel (2025) is a recent exception; their causal estimates of the effects of school finance reform on racial funding gaps are statistically insignificant but imprecise.

The finding that high-poverty and predominantly non-white districts spent the most in recent years is consistent with other studies covering this period, though each study takes a slightly different approach to measuring progressivity. The most consistent finding is that funding within states is progressive. Whether the between-state component fully offsets this within-state progressivity—such that spending is roughly equal or regressive overall—or only partially offsets it varies somewhat across studies. For example, Lee, Shores, and Williams (2022) show little difference in average national spending experienced by children in poverty and those not in poverty. They analyze Black-white and Hispanic-white spending gaps separately, finding small gaps (favoring white students) nationally for the former but larger gaps for the latter, which they attribute to Hispanic students' concentration in lower-spending states. Rauscher and Fiel (2025) is primarily a causal study, but the descriptive figures—based on income quintiles, which are related to but not the same as poverty quintiles—show a similar pattern since 1990: By the mid-2000s, districts in the lowest income quintile within states had per-pupil revenue similar to that for the highest income quintile. They analyze districts by Black and Hispanic enrollment shares separately and find that within-states, per-pupil revenue was similar for districts with high and low Black enrollment shares and for high and low Hispanic share districts through the early 2000s, after which high Hispanic share districts had lower per-pupil revenue. In his review of recent school finance studies, Tyner (2023) concludes that

the "Savage Inequalities" view of school finance, where high-poverty, predominantly non-white districts spend much less than others, is outdated, consistent with what we find here.

The finding that within-state progressivity increased substantially during the adequacy era (after about 1995) is also consistent with existing research, and causal studies suggest that school finance reforms were an important driver of this change with respect to poverty (Sims 2011; Candelaria and Shores 2019). Studies of this era mostly focus on within-state changes, and the offsetting between-state trend we show has received less attention. Corcoran and Evans (2015) show that overall spending inequality increased during this period, driven primarily by between-state inequality, which accounted for roughly 90% of the rise in inequality between 2000 and 2011. To see how the finding of increased progressivity and increased inequality are compatible, we need to distinguish between funding inequality—the spread of per-pupil spending across districts, without reference to which districts are at the top or bottom of the distribution—and funding progressivity or equity—which takes account of whether it is more or less disadvantaged districts that spend more when spending is unequal. Starting from a place where high-poverty districts spend more than average, a further disproportionate increase in spending among the already-higher-spending high-poverty districts will increase both inequality (dispersion) and progressivity simultaneously. The distribution becomes more spread out precisely because it is tilting more toward high-need districts. This is what happened in the adequacy era.

The Great Recession interrupted a period of rapidly increasing average spending and progressivity. More advantaged districts were relatively insulated from cuts. This is consistent with other work showing that the Great Recession hit disadvantaged districts harder and that state funding is more sensitive to economic downturns than local property tax revenue (Evans, Schwab, and Wagner 2019; Bhalla, Chakrabarti, and Livingston 2017; Jackson, Wigger, and Xiong 2021; Shores and Steinberg 2019a, 2019b; Knight et al. 2022; Goldstein and McGee 2021). Both within- and between-state changes contributed to the disproportionate decline in spending among higher-poverty districts in the aftermath of the Great Recession. Federal funding partially offset state revenue losses but was not enough to prevent cuts given the length and depth of the recession. Federal aid during the COVID pandemic was larger and more targeted to high-need districts, with the initial ESSER disbursements arriving at the very end of our study period (Gordon and Reber 2022). Automatic stabilization funding—aid triggered by economic downturns—could help protect high-poverty districts during future contractions (Sheiner and Lee 2019; Fiedler, Furman, and Powell III 2019; Reber and Gordon 2020).

The equity era, roughly the 1970s through the early 1990s, is less well-studied in terms of the relationship between poverty or racial composition and spending. An early and influential causal study of this era's school finance reforms by Murray, Evans, and Schwab (1998) found that court-ordered finance reforms reduced within-state spending inequality, a finding that was often interpreted as evidence that reform improved the position of low-income districts.[25] However, Murray, Evans, and Schwab use a measure of inequality, not progressivity. Conclusions based on these findings that court-ordered SFRs were beneficial to the poorest districts implicitly assume that poorer districts were low-spending, on average. While we unfortunately do not have data for 1972, we show that in 1976, within states, the highest-poverty districts were already spending the most. Because high-poverty districts were not at the bottom of the spending distribution, policies that compressed the distribution of spending by bringing up the bottom did not necessarily target the poorest districts. Indeed, during this era the spending advantage of high-poverty districts

eroded. The analysis of 1976 and 1995 shown in Table 1 suggests that during this period both the within- and between-state components moved to reduce the high-poverty spending advantage.

The importance of the between-state (or regional) component of school funding inequality has been noted as far back as the Coleman Report, published in 1966 (Coleman et al. 1966); our findings show that between-state differences are also important for understanding differences in spending by district characteristics (funding equity). School finance policy and advocacy have largely focused on the allocation of funding within states; this makes sense considering school finance lawsuits are brought under state constitutions, where it is not possible to request redistribution from another state. But when districts have low spending, it is often because they are in a low-spending—usually lower-income—state. Reducing gaps between higher- and lower-spending districts would require significant redistribution of funding across state lines, something only the federal government can do. Closing these gaps would be difficult (Gordon and Reber 2023a), and high-spending states do not produce systematically better educational outcomes (Reber and Goodman 2025).

8.4. INEQUALITY AND INEQUITY DO NOT ALWAYS MOVE IN THE SAME DIRECTION

The distinction between inequality and progressivity also has implications for how we assess current funding equity. When spending is already progressive, higher inequality is not itself a sign of inequity—it may simply reflect that high-need districts are spending more. The relevant question shifts from whether spending varies across districts to whether the variation is sufficient to address the greater needs of disadvantaged students. Most recent academic work on school finance has moved in this direction, but some discussions and policy have not always followed suit. The "equity factor" in the Title I ESEA EFIG formula allocates funds partly based on within-state dispersion of per-pupil current expenditure, reflecting the assumption that more dispersion signals worse equity. Since the mid-1990s, however, higher within-state dispersion has increasingly reflected more progressive spending—high-poverty districts spending more than low-poverty districts in the same state. The equity factor moves a tiny share of Title I funding, so the practical stakes in this example are limited (Gordon and Reber 2023b), but it illustrates a broader conceptual point: As school spending has become more progressive, inequality-based measures have become poor proxies for equity and could even have the sign wrong.

8.5. PUBLIC DISCOURSE OFTEN LAGS THE EVIDENCE

Some of our findings stand in contrast to popular narratives about school funding inequality, even if they are consistent with academic research. Despite the progressive pattern of school funding documented here, public discourse often proceeds as if high-poverty and predominantly non-white districts spend less than their more advantaged counterparts. The perception that districts serving more disadvantaged students have systematically lower spending reflects a historical reality that has not been accurate for at least two decades.

The persistence of these outdated narratives may stem from several factors. First, local property taxes for schools are highly visible compared to less salient state and federal

transfers that disproportionately benefit disadvantaged districts. Second, media reporting often highlights spending comparisons for specific districts without analyzing systematic patterns. Third, some widely discussed reports on school funding exclude federal funds or present "funding gap" measures that can be mistaken for actual average spending levels.

High-poverty schools undoubtedly need more resources than their low-poverty counterparts to provide equivalent educational opportunities; our findings do not contest this. Our goal here is to document how actual average spending levels relate to district characteristics and how that has changed over time. Although this analysis cannot answer the critical questions of how schools can best use their resources or how much funding is needed to meet educational goals, we hope our findings can help ground discussions of school spending in an understanding of historical and current spending patterns.

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Endnotes

1 Assessing the "popular narrative" or "conventional wisdom" is also a challenge, and we suspect that our findings will not be surprising to economists of education or school finance researchers. To understand this better, we asked Claude and Gemini "I am going to share some findings from an analysis of school funding since 1976. Can you tell me whether these findings are surprising based on popular narratives about the distribution of school resources?" We then shared three paragraphs summarizing the findings. Claude responded, "These findings are quite surprising relative to popular narratives about school funding inequality." Gemini's response was "Based on the popular narratives and the academic consensus I've reviewed, your findings are yes [sic], very surprising to the general public, and they add significant, specific nuance that would likely be surprising even to many experts."

2 In some states, LEAs are "dependent" on another government. This means that school districts do not have independent tax and spend authority; instead, they receive transfers from either a county or city/town government.

3 Technically, revenue received by school districts and school spending are not the same thing, though they are tightly linked. In most of the analysis, we focus on spending, but here we show revenue so that we can see how the source of funding has changed over time.

4 See Shores and Lee (2026) for a recent discussion of the changing role of states.

5 The modern Title I program allocates aid based on complex formulas that consider not only the number or share of students below the poverty line but also other categories of educationally disadvantaged students, such as migrant and foster children. See Gordon and Reber (2023b) for more details.

6 Jackson and Mackevicius (2024) conduct a meta-analysis of the effect of school spending on test scores or educational attainment. They estimate that an additional $1,000 of per-pupil spending per year for four years increases test scores by about 0.03 student-level standard deviations. The effects on educational attainment are larger, 2.0 percentage points for high-school graduation and 2.8 percentage points for college enrollment.

7 Capital expenditures are often financed through separate formulas and draw on different tax bases than current expenditures; some evidence suggests that the allocation of capital expenditures is generally not equitable (Lee, Shores, and Williams 2022; Biasi, Lafortune, and Schönholzer 2024). Understanding the allocation of capital expenditure is an important topic for future research.

8 Another concern with using total expenditure or total revenue to track spending is that transfers to other schools can be included in those values. For example, a school district might receive funding from the state that is transferred to a charter school, but the charter school enrollment is not included in the district's enrollment. This will lead to an inflated estimate of per-pupil spending. Current expenditure more closely matches the enrollment reported for the same district.

9 To the extent that some expenditure for current operations is to fund "legacy" retirement benefits, this variable could arguably overstate the resources available for current spending.

10 Weighting by enrollment makes sense because we are interested in understanding how access to funding varies across the student population. Weighting also prevents small high-spending outlier districts from having undue influence on the results. Small districts do not benefit from economies of scale and can be subject to large year-to-year variations in per-pupil spending (which are sometimes real and sometimes measurement error).

11 For instance, we find that around 2016, trends in per-pupil expenditure in the two highest quintiles of child poverty rates move in offsetting directions, but if we hold constant the poverty rate quintiles, the two groups experience trends more similar to each other. This suggests that districts were simply shifting between quintiles and overstating the differential changes in school spending during that period.

12 Some districts that experienced small changes, such as when a large district absorbs a much smaller district, are included in the sample. For districts that exist at the beginning and end of the study period but are missing a year or two of intervening years, we interpolate. See Appendix B for details.

13 Interestingly, while New York City has a CWIFT index that is above average, it is not the highest. For example, school districts in the San Francisco or Boston areas have higher input costs than NYC. CWIFT is designed to capture differences in wages for college-educated workers as a proxy for the price to hire teachers and other staff; this is different from the "cost of living." Some cities have high cost of living (usually due to high housing costs) without commensurately higher wages.

14 For that analysis, we impute the value for 1997 back to 1976. While not ideal, this should capture major differences in input prices.

15 Some researchers have developed similar measures for earlier periods using data from the Census or Current Population Survey (CPS); for the results in the Appendix, we instead impute the earliest value to earlier years, implicitly assuming that relative differences in wage costs are similar over time.

16 We assign districts to quintiles separately for each panel, so the composition of districts in each quintile can change across panels. Therefore, the levels and trends need not be exactly the same in the periods of overlap, though in practice they are quite similar, suggesting the composition does not change dramatically across panels.

17 The different impact that adjusting for CWIFT has on the findings by poverty versus race highlights the fact that—although there is a positive correlation between the poverty rate and non-white share of a district—the two categories are distinct. Non-white students are less concentrated in rural and small-town districts that face lower labor costs, compared to students in poverty. Low-poverty districts (many of which are in suburban areas) face higher wages than their higher-poverty counterparts, but the differences are not as large as differences by racial composition. (See Appendix C for more information.)

18 EdBuild used a cost of living index from the Council for Community and Economic Research rather than CWIFT. We believe that CWIFT, which captures differences in wages for college-educated workers and is designed for this purpose, is more appropriate. The state and local revenue gap is about half as large using CWIFT instead of the cost of living index to adjust; the gap goes in the other direction for unadjusted current expenditure and is near zero for CWIFT-adjusted current expenditure.

19 Any measure of total resources—total revenue, total expenditure, or current expenditure—yields similar findings.

20 EdBuild excludes federal revenue, arguing that their analysis focuses on state and local fiscal effort. However, federal funds are a substantial and intentional component of school finance designed to address inequities, and excluding them provides an incomplete picture of actual resources available to students. Moreover, the finding has been widely misinterpreted as if it reflected total revenue or spending. For example, reporting on the report from NPR was titled "Why white school districts have so much more money," (Lombardo 2019).

21 We use the average child poverty rate between 2010 and 2022 for this exercise. As discussed above, Alaska is excluded from the analysis. Hawaii is included in the analysis but excluded from Figures 5 and 6 (and Figure 9 below) for convenience. Hawaii only has one school district, so there is no within-state variation in spending, poverty, or racial composition.

22 Recall that districts are assigned to quintiles based on their position in the national distribution of poverty or non-white enrollment share, rather than the state-by-state distribution. Studies based on within-state rankings cannot address the between-state component of inequity by design (Lafortune, Rothstein, and Schanzenbach 2018; Rauscher and Fiel 2025).

23 Murray, Evans, and Schwab (1998) find that court-ordered finance reform reduced within-state spending dispersion by 19–34% between 1971-72 and 1996-97, which may appear to conflict with

this finding; the two results measure different aspects of the spending distribution. We discuss the reconciliation in the Discussion section.

24 To fully exclude NYC from the analysis, we would need to recalculate the quintiles, as well as the national and state averages. Here, we simply exclude NYC from the average for its quintile. However, the increase in average spending for New York state (which is the highest-spending state in recent years) is not driven exclusively by NYC. This can be seen by comparing Figures 8a and 8b: The within-state trends are not affected by excluding NYC (trends in the solid and dotted lines are similar in Figure 8b), indicating that the high state average in New York state, more than NYC's spending relative to the state average, is the main reason NYC is such a high-spending outlier, increasingly over time.

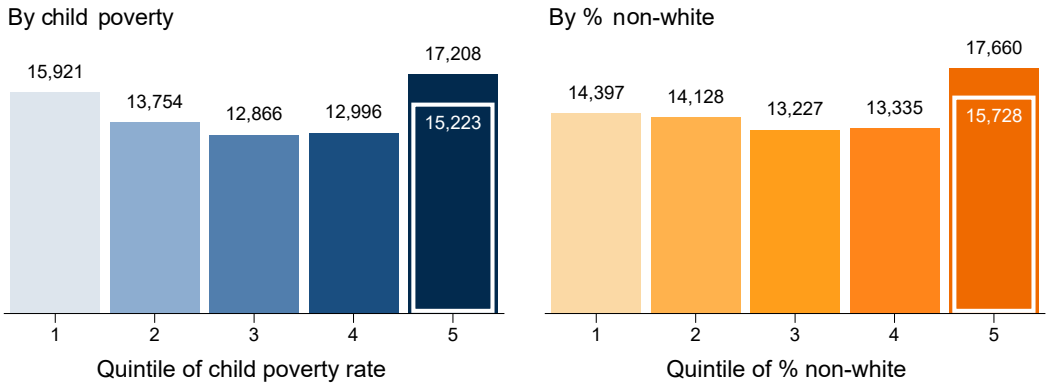
25 For example, Murray, Evans, and Schwab (1998) conclude that "the increase in spending for the poorest districts could have some potentially large benefits," equating districts at the bottom of the spending distribution with the poorest districts.

Appendix A

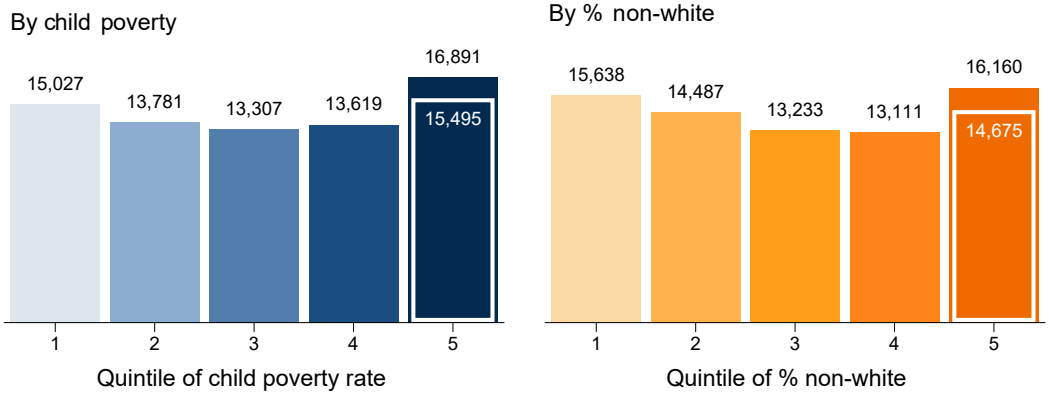
FIGURE A1

Average per-pupil spending in 2020, with and without adjusting for CWIFT

Not adjusted for CWIFT



Adjusted for CWIFT

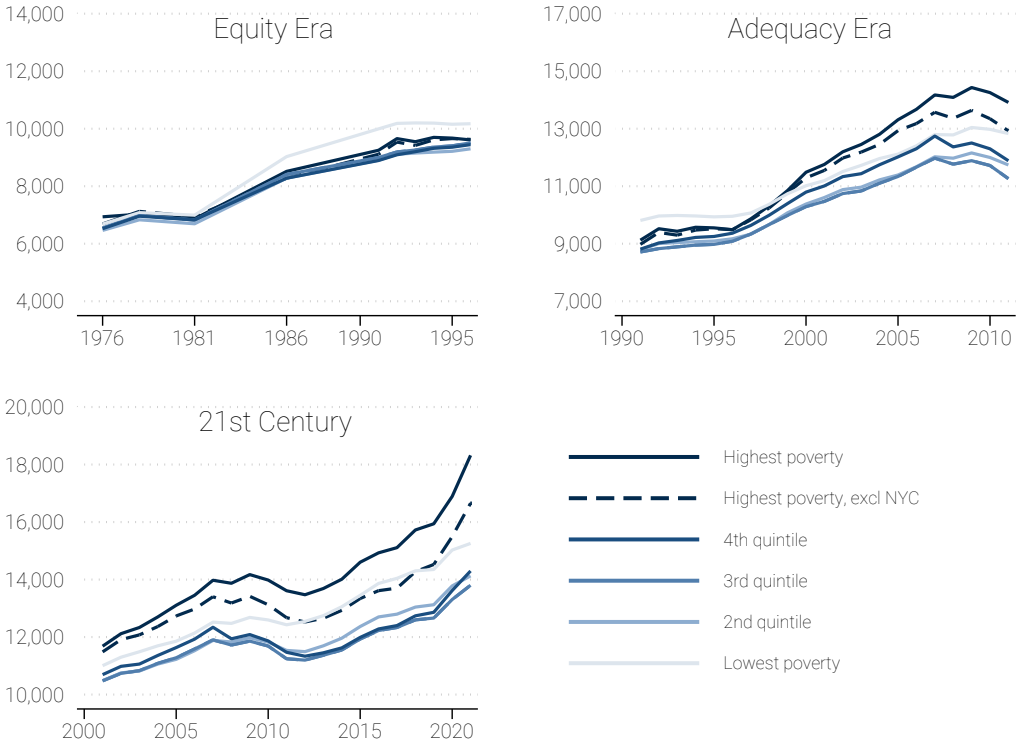


Note: White outlined bar is the quintile average excluding New York City. The first panel repeats the second panel of Figure 2. The second panel shows spending adjusted for differences in the price of college-educated workers using the Comparable Wage Index for Teachers (CWIFT) from the National Center for Education Statistics (NCES). Districts are assigned to quintiles based on the average child poverty rate or % non-white enrollment during the "21st century." See the data appendix for details.

Center for Economic Security and Opportunity at BROOKINGS

FIGURE A2

Per-pupil spending by child poverty rate quintile, CWIFT-adjusted

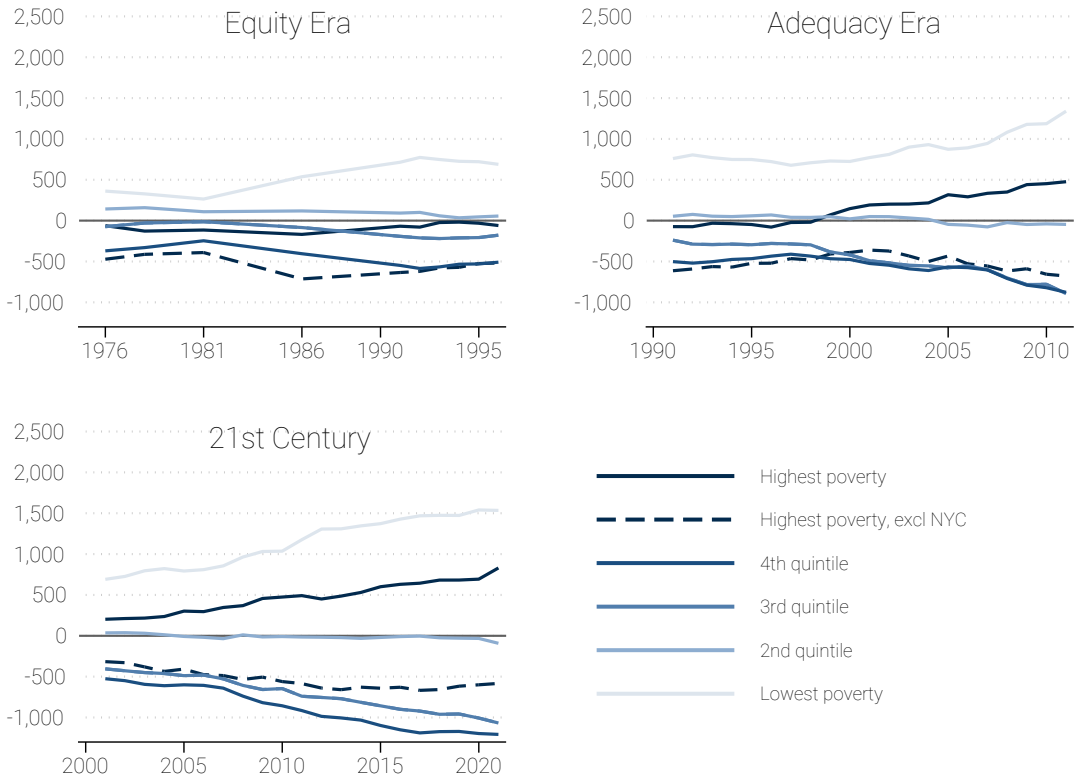


Note: Figure shows the same trends as in Figure 3, adjusted for differences the price of college-educated labor using the Comparable Wage Index for Teachers (CWIFT) and its predecessors. See the data appendix for details.

Center for Economic Security and Opportunity at BROOKINGS

FIGURE A3

Between-state contribution: Average own-state per-pupil spending, CWIFT-adjusted

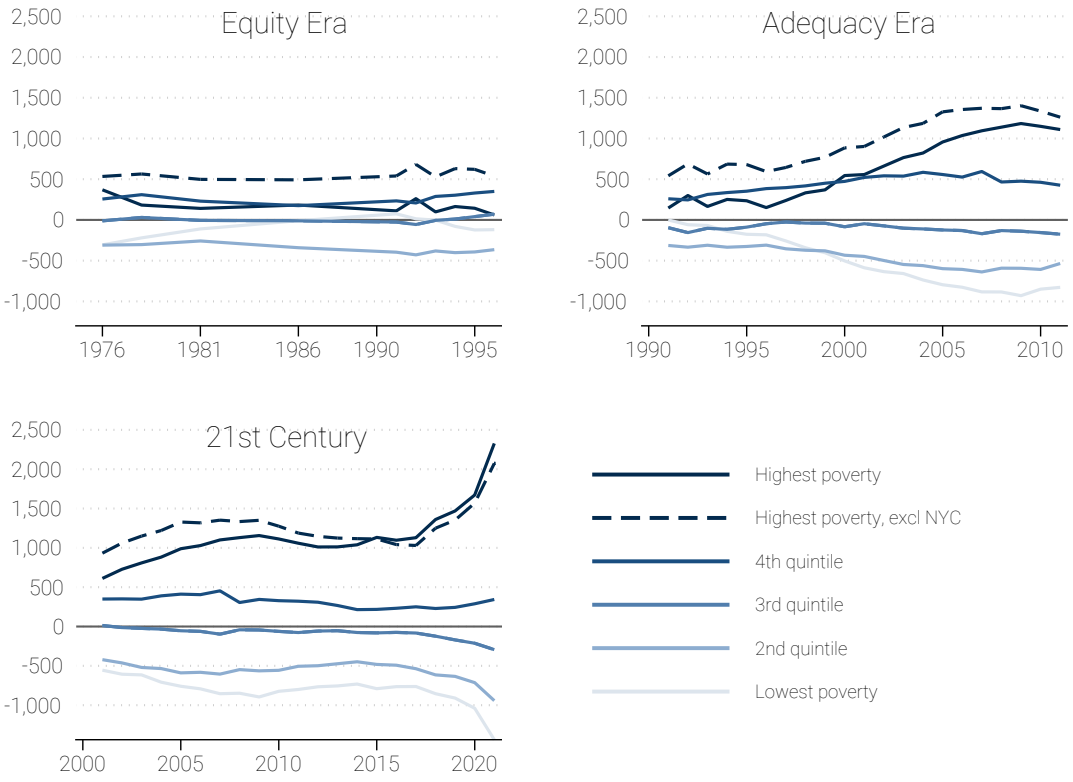


Note: Figure shows the same trend as in Figure 8a, except that per-pupil spending has been adjusted for differences in the price of college-educated labor using the Comparable Wage Index for Teachers (CWIFT) and its predecessors. See the data appendix for details.

Center for Economic Security and Opportunity at BROOKINGS

FIGURE A4

Within-state contribution: Average deviation from own-state average per-pupil spending, CWIFT-adjusted



Note: Figure shows the same trend as in Figure 8b, except that per-pupil spending has been adjusted for differences in the price of college-educated labor using the Comparable Wage Index for Teachers (CWIFT) and its predecessors. See the data appendix for details.

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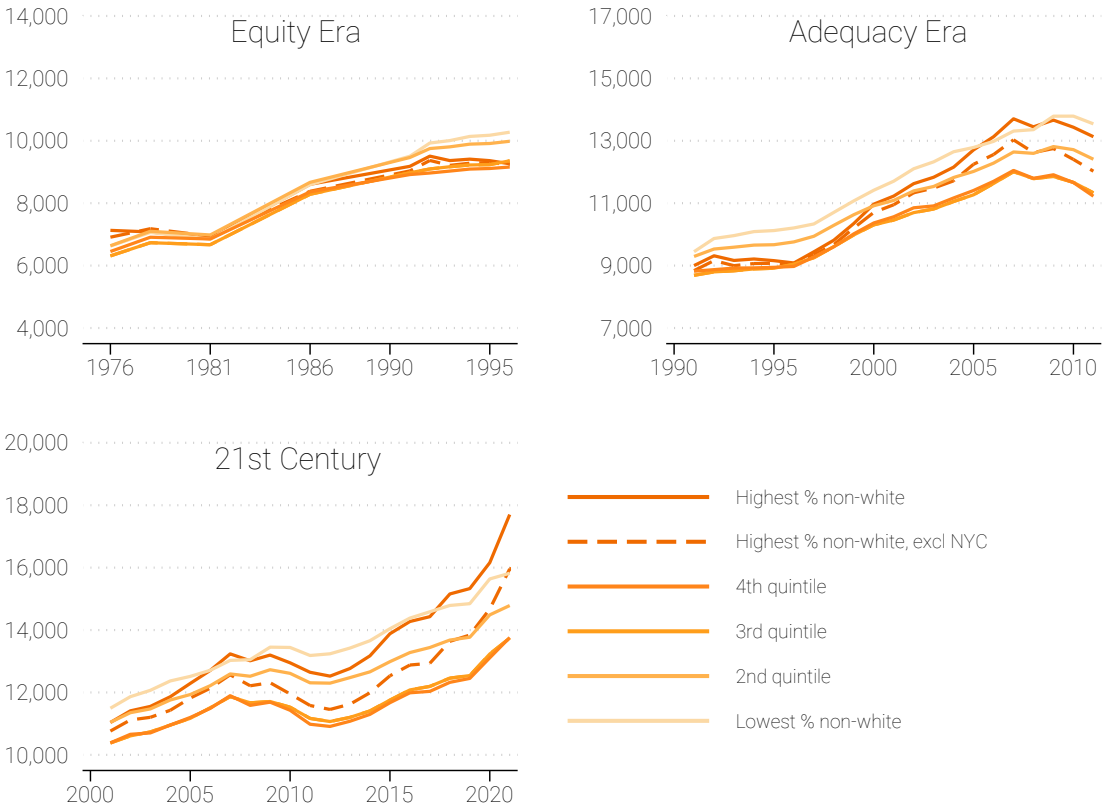
FIGURE A5

Per-pupil spending by percent non-white enrollment quintile, CWIFT-adjusted



Note: Figure shows the same trend as in Figure 4, except that per-pupil spending has been adjusted for differences in the price of college-educated labor using the Comparable Wage Index for Teachers (CWIFT) and its predecessors. See the data appendix for details.

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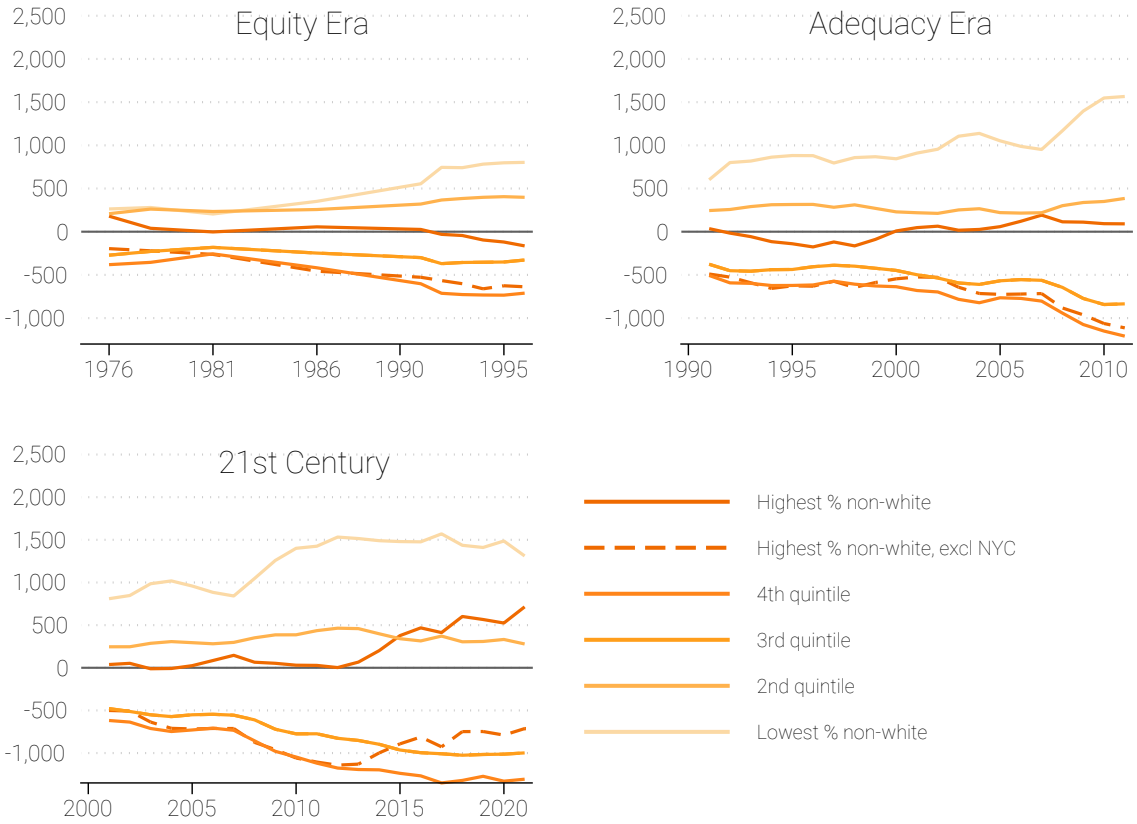
FIGURE A6

Between-state contribution: Average own-state per-pupil spending, CWIFT-adjusted



Note: Figure shows the same trend as in Figure 11a, except that per-pupil spending has been adjusted for differences in the price of college-educated labor using the Comparable Wage Index for Teachers (CWIFT) and its predecessors. See the data appendix for details.

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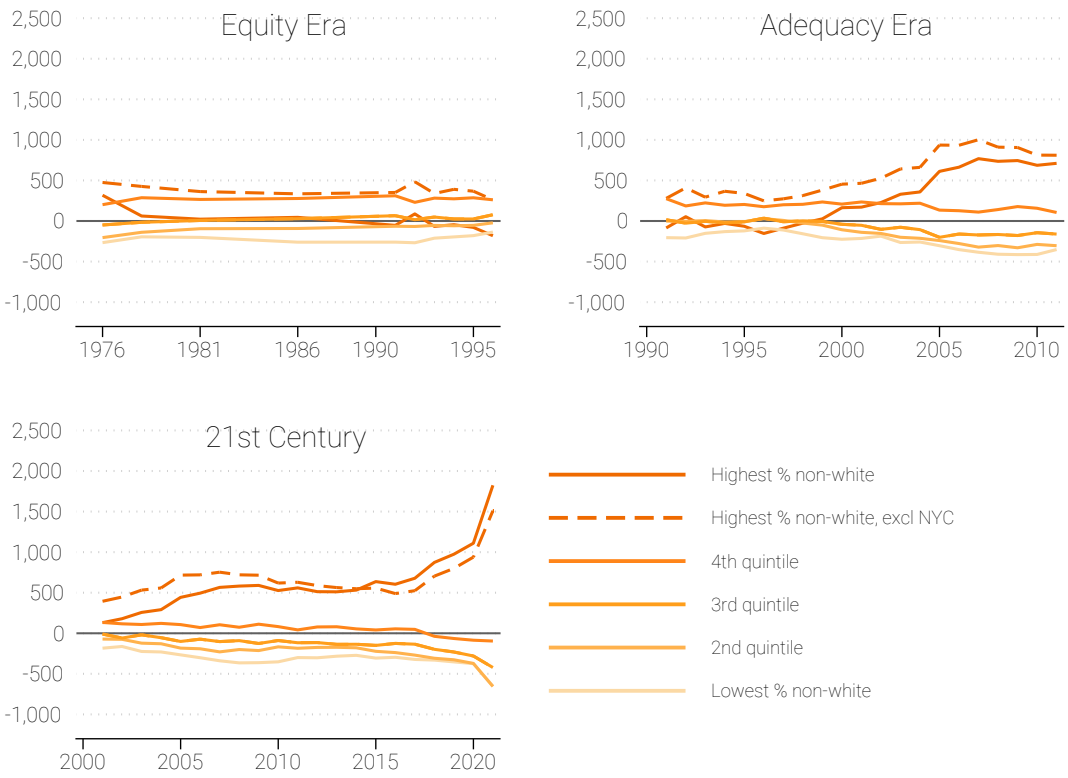
FIGURE A7

Within-state contribution: Average deviation from own-state average per-pupil spending, CWIFT-adjusted



Note: Figure shows the same trend as in Figure 11b, except that per-pupil spending has been adjusted for differences in the price of college-educated labor using the Comparable Wage Index for Teachers (CWIFT) and its predecessors. See the data appendix for details.

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Appendix B. Data

For this report, we used a longitudinal database covering non-charter local education agencies (LEAs, which we also refer to as "school districts") from 1976-77 to the present. The database was constructed by Sarah Reber with the assistance of many research assistants over a span of years. We are particularly grateful to Rebecca Lowry for her invaluable contributions to creating this database, and to Ben Denckla for recovering the Office of Civil Rights (OCR) data.

We begin by creating a "school district universe" using the National Center for Education Statistics (NCES) Common Core of Data (CCD) local education agency (LEA) universe and its predecessors. With a few exceptions, we consider CCD "canonical" and use it to determine the universe of districts that exist in each year. We then merge other datasets to this universe, dropping observations from the other dataset that do not find a match in the universe. For this report, we use a district-year panel spanning the 1976-77 to 2021-22 school years; we refer to years by the fall of the school year (so 1976-77 is 1976). Some of the variables we study were not collected for every district every year, so in some cases we interpolate missing data.

SCHOOL DISTRICT UNIVERSE

As described above, we use the CCD and its predecessor, the Elementary and Secondary General Information System (ELSEGIS) Public School District Files to construct the school district universe; no district-level CCD file is available for 1984-85, so we use the Common Core Public School Universe (PSU), aggregated to the district level. For 1997-98 and later years, we obtained the raw data files from the National Center for Education Statistics (NCES) website. In earlier years, the data collection was referred to as "Elementary and Secondary General Information System (ELSEGIS): Public School District Universe," and we obtained the data from ICPSR.

We keep only districts we consider "regular" local education agencies, excluding state and federal agencies, supervisory units, and charter schools that are independent LEAs. Aside from charter agencies, these excluded districts have little or no enrollment. We would have liked to include charter schools in our analysis, but they are mostly not in the Census of Governments, so we do not have data on their finances.

Though there are many school district splits in the data, on net, school districts have consolidated over time; the data includes almost 16,000 districts covering 44 million students in 1976 and about 13,100 districts covering 46 million students in 2021.

SCHOOL FINANCE DATA

For school finance measures, we use the Census of Governments Annual Survey of Local Government Finances (School Systems)/F33 and its predecessors. For fiscal years starting in 1992, we obtained these data from the Census website. Data were not published annually for the universe of school districts prior to 1992, and some government finance data have two key limitations. First, dependent school districts are not always included in the data in earlier years. One can attempt to recover some information from the record of the parent government (a county, city, or town), but in our experience this is not particularly reliable or consistent across states. Second, revenue from the federal government that passes through the state is sometimes classified as revenue from the state. We found tabulations of the finance data specifically for school districts that address these issues for 1976-77, 1978-79, 1981-82, and 1986-87.

For 1976-77, we use "ELSEGIS Merged Federal File" from ICPSR; this dataset includes tabulations of the Census of Governments specific to school districts, merged with ELSEGIS data on enrollment, and special tabulations of the Census. For 1978-79, we use a similar file that we obtained from ICPSR (though it was not publicly released); it contains the same type of information as the 1976-77 merged file. For 1981-82, we use a data file shared with us by Sean Corcoran; this file was not well-documented but apparently came originally from Census. It includes dependent districts and federal revenue that passes through the states is reported separately, but this file is missing variables on debt service and total expenditure. In this report, we focus on expenditure for current operation, so the missing information on expenditure for debt service is not a problem. For 1986-87, the "D" file of the ICPSR release of the Census of Governments covers all school districts, including dependent districts. The Census publication "Finances of School Districts" typically included a table reporting enrollment and key revenue and expenditure variables for the largest school districts. We checked the construction of the key revenue and expenditure variables (though in this report we only use current expenditure) against this table. This process revealed a few apparent errors that we correct and gives us a degree of confidence in the older data that were not well-documented.

Our main variable of interest is per-pupil total current expenditure for elementary and secondary education, which excludes transfers to other governments, avoiding concerns about mistakenly counting funding that is later transferred to charter schools (which inflates per-pupil spending because the charter school students are not in the denominator).

We linearly interpolate missing data for up to two consecutive years for current expenditure and enrollment.

CHILD POVERTY RATE

For the child poverty rate, we use the Small Area Income and Poverty Estimates (SAIPE) estimates of the child poverty rate for 5 to 17 year-olds at the school district level produced by the Census Bureau for 1995, 1997, and 1999-2021. For 1970, we use the estimate based on the decennial Census as reported in the 1976-77 ELSEGIS Merged Federal file described above. For 1980 and 1990, we use special tabulations of the Census available as the School District Data Book (SDDB), from ICPSR and the National Bureau of Economic Research (NBER), respectively. In 1970-1990, the child poverty rate is for ages 6 to 17; in SAIPE, it is for ages 5 to 17. In all cases, the poverty rate is for children living in the school districts' boundaries, regardless of whether they attend public schools. We interpolate linearly for years that are missing.

RACIAL COMPOSITION

For the racial composition of enrollment, we use three sources. For the even years between 1976 and 1986, we use the Office of Civil Rights (OCR) district level data. For 1988-1990, we use the Common Core Public School Universe (PSU), aggregated to the district level. For later years, we use "LISD_1.1" from the Segregation Tracking project of The Educational Opportunity Project at Stanford University (SEDA). The data from SEDA are based on the Common Core PSU but make some imputations and corrections. The OCR data cover the universe of school districts in 1976, but only a sample (favoring large districts and those that were under court order to desegregate or of interest to the Office of Civil Rights) in later years. In addition, not all states reported enrollment by race to the Common Core in the late 1980s and early 1990s. We interpolated missing years linearly.

COMPARABLE WAGE INDEX

To adjust per-pupil spending to account for differences in the wages of college-educated workers, we use the American Community Survey Comparable Wage Index for Teachers (ACS-CWIFT) for 2013, 2015, 2017, 2018, and 2021; and we use the Comparable Wage Index (CWI) for 1997-2005. We assign each district its 1997 value to all earlier years. To avoid losing observations, we fill in missing values with the average of other districts in the county—or if that is also missing, the state—in the same year.

The comparable wage indexes are designed to compare spending across places in the same year but not necessarily over time. After adjusting for CWIFT in each year, we multiply CWIFT-adjusted spending in every district by a constant so that the enrollment-weighted average per-pupil spending is the same as in the unadjusted data.

SAMPLE SELECTION

We begin with all non-charter school districts from 1976 to 2021 but make a few sample restrictions based on data limitations. First, we drop any years for which school finance data are not available, which leaves 1976, 1978, 1981, 1986, and 1991-2021. We also trim the sample based on an unweighted measure of per-pupil current expenditure. Within each year, we flag any observations with spending that was less than half of the per-pupil spending at the first percentile or twice the spending at the 99th percentile; this procedure eliminates extreme outliers which may be due to reporting errors (e.g., the wrong enrollment is matched to the spending data). We drop entire districts if there was ever an outlier between 1976 and 2021, which tend to be districts with small enrollments; this procedure drops about 2% of district-year observations, accounting for about a quarter of a percent of enrollment. We find that Alaska has many small districts that are high-spending outliers, so we drop the entire state from our sample.

As described in the main text, we construct three overlapping 20-year balanced panels limited to districts that did not significantly change their boundaries within the relevant time period (1976 to 1996, 1991 to 2011, and 2001 to 2021). We require districts to have non-missing data (after the imputations described above) on enrollment and current expenditure for the first and last year covered by each balanced panel.

Within each balanced panel, we assign districts to a quintile based on the average of all the available values (including imputed values) of child poverty and percent non-white, respectively. This means that districts do not change quintiles within each 20-year period, but may change quintiles across the three panels.

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Endnotes

1 A few dozen districts—usually elementary and high school districts covering the same area—always appear aggregated in the finance data (Census of Governments/F33) but separately in the CCD; we aggregate them in the universe. Similarly, we also aggregate the sub-districts of New York City Public Schools to a single district to match the finance data.

2 School districts sometimes change their boundaries, split, or merge. We tracked boundary changes from 1970 to the present as best we could. Mostly, we did this by inspection: School district merges or splits typically occur within the same county, and often the changes can be inferred based on changes in enrollment and/or the names. For example, we might observe district A and B with enrollments of 2,500 and 10,000, respectively in 1981 and a new district C with enrollment of 13,000 in 1983; sometimes the new district's name will also have a name that includes some variation of A and B. In this case, we will record a merger of A and B to C between 1981 and 1982. Some changes are more complicated (e.g. part of A joins B, and part of A joins C), and tracking the changes based on enrollment and names is more difficult when the changes are complex or enrollment is more volatile. Determining what happens to small districts that disappear is particularly difficult, and we could not determine how boundaries changed for a small share of districts, usually with enrollments in the low hundreds or less. For some states, we were able to find records describing these changes, in which case we used those to track the changes. The upshot of this process is that we created a "canonical" universe to which we merged the other datasets. In addition, we can create a version of the ID (with some error) such that an ID tracks a district with constant boundaries. Sometimes a district will change boundaries while maintaining the same ID, especially in earlier years of the data; we use the information tracking boundary changes to split such a district, reflecting the fact that it is not really the same district after the merger (or vice-versa for splits). We can also use this to aggregate districts to constant boundaries across a particular period, though we do not take advantage of that in this paper.

3 In many cases, the IDs were supposed to be the same across datasets, but we had to correct IDs so that they would match the ID used in the universe.

4 Particularly in the early years, the classification of some districts (such as regional high school districts) is inconsistent across states and time. We reconciled the type coding across states and years to make sure we weren't dropping regular districts. Aside from the charter LEAs, the vast majority of excluded districts have little or no enrollment and don't appear in the Census of Governments.

5 For example, Individual Government Finance (INDFIN) data and the Census of Governments available at ICPSR for fiscal years 1972, 1977, and 1982 do not include dependent school districts. INDFIN includes some of the intervening years between 1976 and 1991, but we do not incorporate these data because then we would lose the states that have dependent school districts. The inability to correctly classify federal revenue that passes through the state is less of an issue in this report because we focus on current expenditure per pupil, rather than revenue by source.

6 For example, the "public utilities tax" was missing from the 1986-87 Census of Governments "D" file, but this was needed to match the "total local taxes" in the 1986-87 "Finance of Public School Systems," so we read it from the "A" file. For 1991-1997, the variable J10 ("State payment on behalf of the LEA, other employee benefits") is classified as expenditure for non-elementary and secondary education, which in turn is subtracted from total current spending for elementary and secondary programs (TCURELSEC), but in later years, J10 is included in TCURELSEC. We add J10 to TCURELSEC for 1991-1997 for consistency. J10 is generally small relative to the total, especially in the early years, so this is not consequential for the analysis.

7 This is particularly important for the early 1990s because several states did not report finance data for

the universe of districts in 1992 and/or 1993; the interpolation prevents us from losing these districts from the analysis.

8 Reber received the OCR data on tapes from UCLA and Ben Denckla converted them to a usable format. These data will soon be accessible through SEDA's Segregation Tracking Project.

9 Additional school finance data became available while we were completing this report but considering the long horizon of the analysis and the unusual infusion of federal funding after 2021, we have not incorporated it into this report.

Appendix C. Comparison to "$23 Billion" Report

In this appendix, we compare our results—which show that per-pupil spending is highest for districts in the highest quintile of non-white enrollment share throughout the period under study—to a highly cited 2019 report that concluded: "Nationally, predominantly white school districts get $23 billion more than their non-white peers, despite serving a similar number of children. White school districts average revenue receipts of almost $14,000 per student, but nonwhite districts receive only $11,682. That's a divide of over $2,200, on average, per student." (EdBuild 2019)

We walk through the replication in detail below, revealing two factors that together explain the divergence in the findings:

1. EdBuild adjusts funding for differences in input prices, whereas we present averages adjusted for differences in input prices in the appendix. Additionally, they use a non-standard measure of price differences. Applying any adjustment and using the non-standard measure instead of CWIFT both affect the estimated funding gap.
2. EdBuild focuses on state and local revenue instead of a measure of total resources. We focus on current expenditure, but the results are similar for other total resource measures, including total revenue and total expenditure. Excluding federal revenue, which is targeted to disadvantaged districts, has a substantial impact on the estimated funding gap.

These two factors also interact: Using a total resource measure and the EdBuild adjustment cuts the per-pupil funding gap roughly in half, but it is still bigger than the results in our Figure A5. Using a total resource measure and adjusting using the more-standard CWIFT, the gap is small, consistent with our CWIFT-adjusted findings reported in Figure A5—which shows a gap between the highest- and lowest- non-white share districts close to zero. Unadjusted total resource measures (such as current expenditure) show substantial funding gaps in the opposite direction (favoring non-white districts), consistent with our Figure 4. The following factors are not important sources of difference between our findings:

1. Data source or updates to the data since EdBuild conducted their analysis. We use the same data, which has been updated by Census, but those differences are small.
2. Sample selection. Our sample is similar to EdBuild's, and the small differences do not have much impact on the findings.
3. Racial composition data sources or definitions. We use updated racial composition data (from the same underlying source) and classify districts in quintiles of non-white share rather than according to specific percent non-white cutoffs. Our top and bottom quintile correspond approximately to EdBuild's predominantly white and non-white categories, and these differences do not have much impact on the findings.

We also note that 2015, the most recent year available at the time of EdBuild's analysis, was not particularly anomalous relative to nearby years. However, predominantly non-white districts were more affected by the Great Recession, so the 2010s were somewhat anomalous historically.

CREATING THE REPLICATION DATA

To understand if the differences between our analysis and EdBuild's are due to differences in the data, sample, or other analytic choices, we used their replication files to recreate the dataset used in their analysis (which includes the state and local revenue, enrollment, cost of living index (COLI), and racial composition variables used in their analysis) merged to the data we used in this paper (which includes enrollment, racial composition, and state and local revenue from the same sources as in the EdBuild data, as well as some additional variables: current expenditure, total revenue, total expenditure, and CWIFT).

To access the replication data, we used the edbuildr R package, developed by EdBuild, together with the R script and the data file listing BIA schools posted on the $23 billion report replication website. We executed the 23_billion.R script (which uses the edbuildr package) and saved out the project master file (master_16) for analysis; we refer to this as the "EdBuild Replication Data." We are able to replicate the headline $23 billion finding (Row 2 of Table C1), suggesting this is the same data EdBuild used in their analysis (we conduct our analysis in Stata).

We merged the EdBuild Replication Data to the 2015-16 data we constructed for this report (the same year EdBuild used in their analysis); 79 of 12,824 districts in the EdBuild data did not merge to a district in our dataset. The non-merging districts account for just 0.25% of enrollment, so we did not investigate the non-merges further for this exercise. We drop districts that were in our data but not in the EdBuild data to match the restrictions they made in their analysis (which are standard). With these restrictions, our Working Dataset includes the same districts as the EdBuild data, except for the 79 districts that did not merge (which, as noted, account for a negligible share of districts and enrollment).

EdBuild assigned districts to categories based on their non-white share of enrollment and compared aggregate state and local revenue for predominantly non-white and predominantly white districts, which they define as more than 75% non-white and more than 75% white, respectively. The authors of the report note that predominantly white and predominantly non-white districts enrolled similar numbers of students, so they highlight the comparison of aggregate—rather than the more typical per-pupil—funding for their national analysis. In our replication, we show how the headline "funding gap" is affected by analytic choices and data source. The aggregate gap can be difficult to interpret without more context (total spending in 2015-16 was more than $650 billion), so we also report the gap in per-pupil terms (the difference in average per-pupil funding, weighted by enrollment, for predominantly white and non-white districts). The per-pupil metric also accounts for changes in the sample across scenarios (though these are minimal).

For 102 districts accounting for roughly 1% of enrollment, the racial composition category based on our data (using the same non-white share cutoffs) did not match that in the EdBuild replication data. We use EdBuild's racial composition definition throughout, but this choice has only a small effect on the findings.

ESTIMATING THE FUNDING GAP FOR ALTERNATIVE SCENARIOS

Table C1 shows how the "funding gap" between predominantly white and predominantly non-white districts depends on the data source, resource definition, and method of adjusting for differences in input costs.

TABLE C1

		Data source	Adjustment	Gap (billions)	Gap (per-pupil)
State and local revenue					
(1)	As reported	EdBuild Report	COLI	23	2,226
(2)	Our replication	EdBuild Replication Data	COLI	22.5	2,109
(3)	Excl non-matching obs	EdBuild Replication Data	COLI	21.2	2,083
(4)	F33 revenue definitions	Brookings Working Data	COLI	19.7	1,971
(5)	CWIFT instead of COLI	Brookings Working Data	CWIFT	12.6	1,475
(6)	Unadjusted	EdBuild Replication Data	None	-9.5	-334
(7)	Unadjusted, our data	Brookings Working Data	None	-12.5	-563
Total revenue					
(8)	Unadjusted	Brookings Working Data	None	-23.0	-1,375
(9)	COLI adjusted	Brookings Working Data	COLI	12.6	1,428
(10)	CWIFT-adjusted	Brookings Working Data	CWIFT	3.7	796
Current expenditure					
(11)	Unadjusted	Brookings Working Data	None	-21.5	-1,324
(12)	COLI adjusted	Brookings Working Data	COLI	9.8	1,144
(13)	CWIFT-adjusted	Brookings Working Data	CWIFT	1.2	526

We replicate EdBuild's headline finding using the EdBuild replication data

We start by replicating the EdBuild result directly using their data, their definition of resources, and the measure they use to adjust for differences in input prices, which is a local area Cost of Living Index (COLI) from the Council for Community and Economic Research. The first row shows the funding gap as reported in the report, $23 billion; the second row shows that we replicate this number ($22.5 billion) using their definitions and methods with the EdBuild Replication Data.

Restricting the sample to districts with complete data in the Brookings Working Data has little effect

For the remainder of the table, we restrict the sample to districts that merged to our dataset and have non-missing data for all the resource measures reported in the table as well as enrollment, CWIFT, and COLI; 91 districts (out of 12,822) accounting for about 139,000 students (out of 48 million) are excluded for this reason. Row 3 (compared to row 2) shows that this restriction reduces the spending gap only modestly to $21.2 billion, a reduction of only $26 (or 1%) on a per-pupil basis.

RESULTS ARE SIMILAR USING BROOKINGS WORKING DATA

Row 4 shows the results for COLI-adjusted state and local revenue using the same sample as in row 3, but with the Brookings dataset; the gap is about 7% smaller at $19.7 billion (5% smaller in per-pupil terms). EdBuild made three subtractions from state and local revenues: (1) revenue for capital (subtracted from state revenues), (2) money generated from a sale of property (from local revenues), and (3) an estimate of revenues received by local school districts that are passed through to charter schools. We do not use state and local revenue in our analysis, but for this replication exercise, we use these variables as reported in F33 without making those subtractions. EdBuild also likely used preliminary data (since that was what was available when they conducted their analysis), whereas we use more updated data. The subtractions and updated data explain the small difference between rows (3) and (4).

ADJUSTING WITH CWIFT INSTEAD OF COLI REDUCES THE FUNDING GAP

EdBuild adjusts state and local revenue with a proprietary county-level "cost of living index" (COLI) measure produced by the Council for Community and Economic Research (C2ER). Many school finance researchers adjust for differences in input prices using CWIFT (which was created by NCES for this purpose).

Using the more standard CWIFT instead of COLI reduces the spending gap for state and local revenue from $1,971 to $1,475 per pupil (about 25%) (row 5). The direction of the spending gap reverses for unadjusted state and local revenue (row 6), with predominantly non-white districts having $9.5 billion ($334 per pupil) more in state and local revenue than predominantly white districts (or $12.5 using the Brookings Working Data, which does not make the subtractions described above; see row 7).

We report results for unadjusted per-pupil spending throughout the main report and CWIFT-adjusted findings in Appendix A as discussed in the report.

USING A TOTAL RESOURCE MEASURE REDUCES OR REVERSES THE FUNDING GAP

The resource measure used in the EdBuild report is state and local revenue, excluding federal revenue. The report provides this explanation for this decision: "We exclude federal dollars from all analysis because they are largely intended to supplement state and local dollars." Indeed, some federal funding streams are intended to "supplement not supplant" state and local resources (Gordon and Reber 2015) and it can be worthwhile to analyze funding by source (for example, Chingos et al. (2017)). However, the exclusion of federal revenue could be misleading if readers interpret "predominantly white school districts get $23 billion more than their nonwhite peers" to imply predominantly white schools have more to spend, that is, that the calculation was based on a measure of total resources. (Whether readers imagine funding has been adjusted for regional price differences is also unclear),

Total revenue (or expenditure) offers a more complete picture of the resources available to school districts. In our analysis, we focus on current expenditure (which excludes spending on capital or debt service) rather than total expenditure or revenue because it is less subject to year-to-year fluctuations and does not require an adjustment to account for funding that passes through to charter schools. However, these three measures—total revenue, total expenditure, and current expenditure—are highly correlated, and show similar results.

The remaining panels of Table C1 show the funding gap for total revenue and current expenditure. The EdBuild Replication Data did not include these variables, so all the analysis uses our data (though the analysis of state and local revenue suggests this sourcing is unlikely to affect substantive findings). For each resource measure, we show the gap without any adjustment (as in the main report), adjusting using COLI (as in EdBuild), and adjusting using CWIFT (as in our Appendix figures).

The aggregate gap in actual funding is negative $23.0 and $21.5 billion for total revenue and current expenditure, respectively (-$1,375 and -$1,324 per pupil). Considering total resources (measured by revenue or expenditure), the funding gap favors predominantly non-white districts (rows 8 and 11). Adjusting using either COLI or CWIFT flips the sign, but the magnitude of the CWIFT-adjusted gap is small—$3.7 and $1.2 billion for total revenue and current expenditure, respectively. This corresponds to a 4-5% difference between spending per-pupil in predominantly white and non-white districts.

SUMMARY AND CONCLUSION

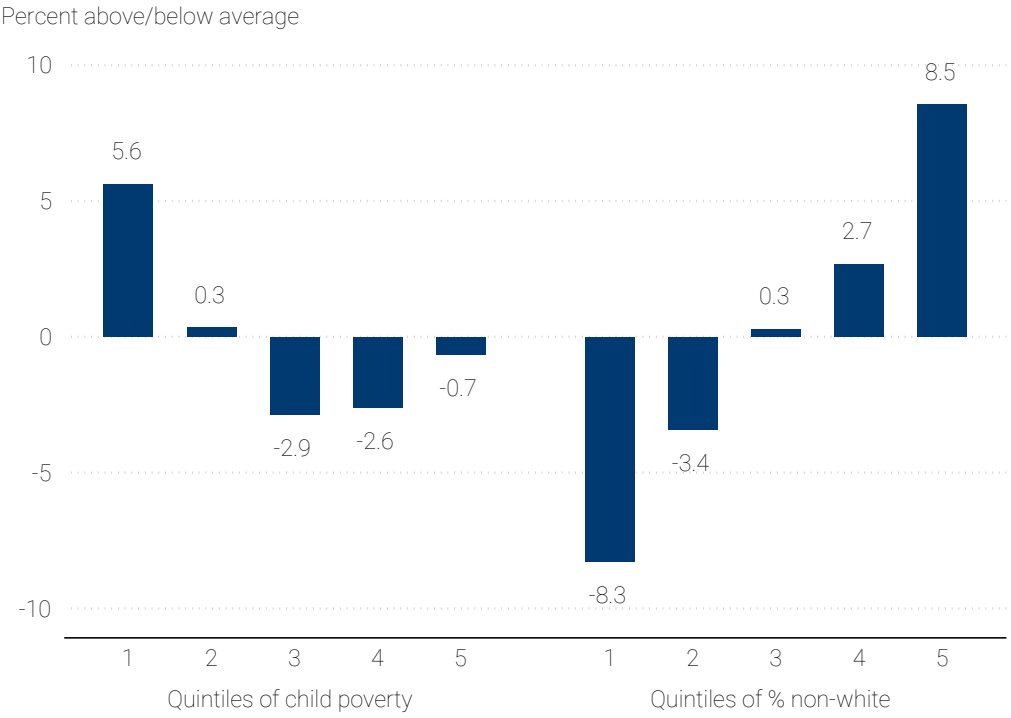
Overall, this analysis shows that two factors together account for the divergent findings of our analysis and the "$23 billion" report: (1) the measure of "funding" and (2) whether and how funding is adjusted for differences in input prices across districts. When state and local revenue is the measure of funding (as in EdBuild), adjusting using CWIFT instead of COLI reduces the funding gap from about $2,000 to $1,500 per pupil (rows 4 and 5). Using current expenditure instead of state and local revenue as the funding measure and CWIFT to adjust reduces the gap further to about $500 per pupil (row 13). This is similar to the gap for 2015 between the highest- and lowest-non-white share districts in Figure A5. Note that the gap (unadjusted) reported in row 11 (-$1,300 per pupil) is similar to the gap between the highest- and lowest-non-white share districts in 2015 (Figure 4). That is, using current expenditure as the resource measure and without adjustment, the funding gap favors non-white districts in the year of EdBuild's analysis.

As we note in the main text of this report, adjusting for CWIFT has a larger (and opposite) effect on comparisons by racial composition compared to analysis by the child poverty rate. While the gap favoring predominantly non-white districts is smaller when adjusting for CWIFT, it is positive except during the Great Recession and its aftermath. On the other hand, the gap favoring high-poverty districts is larger when adjusting for CWIFT. This is because low-poverty districts are disproportionately in higher-price states and face higher prices for labor relative to other districts in the same state.

The figures in Appendix A show how the findings are different if we adjust for CWIFT. To help illustrate the role of CWIFT adjustment in explaining the differences between EdBuild's analysis and ours as well as the different effects of CWIFT adjustment on the findings by poverty and racial composition, we plot average CWIFT by quintile directly in Figure C1 for 2015-16. We normalize CWIFT so that the enrollment-weighted average in the full sample is 100 and subtract 100 from the quintile average so that the figure shows how the price of college-educated workers in each quintile compares to the national average. For example, the price of labor is 5.6% above average for school districts in the lowest-poverty quintile. Differences in CWIFT across child poverty quintiles are smaller than differences across quintiles of % non-white. Low-poverty districts face the highest input prices—between about 5 and 8% higher than the other quintiles. Predominantly white districts face the lowest prices, and predominantly non-white districts face the highest prices—differing by almost 17%. This explains why adjusting for CWIFT generally makes funding look more equitable with respect to child poverty but less equitable with respect to historically disadvantaged racial groups. More broadly, while there is a positive correlation between child poverty and percent non-white and both high-poverty and predominantly non-white districts saw their spending increase disproportionately after the mid 1990s, the two groups are not the same.

FIGURE C1

Difference in the price of college-educated labor according to CWIFT, 2015-16



Note: Figure shows the enrollment-weighted average value of the Comparable Wage Index for Teachers (CWIFT), relative to the full-sample enrollment-weighted average, by quintile. For example, a value of 5 indicates that prices for college-educated workers were 5% above average for districts in the relevant quintile.

Center for Economic Security and Opportunity at BROOKINGS

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Endnotes

1 The CWIFT-adjusted spending gap began to favor predominantly white districts in the Great Recession, widening through about 2012, but was close to zero by 2015 and returned to favoring non-white districts in the late 2010s.

2 These resources can be found at https://github.com/EdBuild/edbuildr; https://github.com/EdBuild/R-scripts/blob/master/23%20Billion/23_billion.R; and https://github.com/EdBuild/R-scripts/blob/master/23%20Billion/SchoolDistricts_UE_2014_ReservationSchools.csv. We saved the master_16 data file using this method in 2022. The edbuildr package is incompatible with the current version of R, so we are not able to check for updated data. Based on our analysis, this appears to be the same dataset EdBuild used to produce their analysis (rows 1 and 2 of Table C1 are the same, accounting for rounding).

3 In creating our working dataset, we sometimes edited the district ids to ensure the F33 data match with the NCES Common Core Data; most of the non-merging districts fall in that category or are districts we did not consider "regular" (such as "accommodation" or "supervisory" districts) and dropped from our analysis. These small differences are expected when constructing a complex dataset.

4 EdBuild makes several exclusions that are common in school finance analysis and similar to what we do: They exclude districts that are not "regular" local education agencies (e.g. non-operating, special education, vocational, supervisory, charter), districts with zero or missing enrollment, or missing revenue data and districts with very low or very high per-pupil revenues. They also exclude districts "that intersect with Native American Reservations because federal dollars are a much larger proportion of revenue for Bureau of Indian Affairs (BIA) schools and the federal dollars are not always intended to supplement funds from BIA." The latter is not typical but affects a small number of schools and makes sense considering their focus on state and local revenue as their resource measure.

5 About 23.3 million students were enrolled in districts with intermediate non-white shares and therefore excluded from the EdBuild comparison.

6 We use racial composition data from the Segregation Tracking Project of the Stanford Education Data Archive (SEDA); this is based on the same underlying data as EdBuild uses (the Common Core of Data (CCD)), but SEDA implements some corrections and imputations to the racial composition (and free lunch eligibility) data. For most of the districts where there is a mis-match, the non-white share is either 0 or 1 in the EdBuild data; these may reflect errors that were corrected or imputed by SEDA.

7 Using our racial composition measure with the EdBuild data, the funding gap is $22.96 instead of $22.52 billion.

8 This measure is proprietary (https://www.coli.org/products/) and not reported directly in the replication file, but the file includes both adjusted and unadjusted version of local revenue (LR and LR_COLA), state revenue (SR and SR_COLA), and state and local revenue (SLR and SLR_COLA). We use these to recover the COLI for each district. For districts in Vermont, the COLI recovered using SR was different (and appears incorrect) than that based on LR. We use the COLI based on LR but note this could mean there was an error constructing the data for Vermont.

9 The question of how to handle revenue that districts pass through to charter schools is one reason we chose to analyze expenditure for current operation; that variable does not have this issue.

10 Because the difference between rows (3) and (4) is small and obtaining the preliminary data and/or applying the subtractions to state and local revenue in our data would be time-consuming (and maybe impossible), we do not conduct further analysis to distinguish these two potential explanations.

11 As we note in the report, the findings were widely interpreted this way in the media.

12 School districts generally have to balance the budget in the long run, so total revenue and total expenditure will be roughly the same over long periods, accounting for the fact that capital investments are often paid for over time.

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