Racial Disparities in Education Finance: Going Beyond Equal Revenues

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Racial Disparities in Education Finance: Going Beyond Equal Revenues

Education has largely been seen as the most direct route out of poverty and into the middle class. Beginning with the Coleman report (Coleman et al. 1966), which documented the disparities in academic achievement across different ethnic and racial groups, there has been concern about understanding these disparities and closing these gaps. An obvious source of the disparity in academic achievement has been the variation in educational opportunities arising from differences in educational spending. In the past, because public schools were funded largely by local property taxes, property-rich and -poor school districts differed greatly in expenditures per pupil. Since the early 1970s, however, state legislatures have, on their own initiative or at the behest of state courts, implemented school finance equalization programs to reduce the disparity in within-state education spending.

Nonetheless, large financial differences remain. In addition, many nonfinancial measures of school quality and student outcomes still differ greatly across social and economic groups. Schools with high concentrations of poor or minority students have a higher incidence of school violence, more poorly maintained physical structures, more less-experienced teachers, and fewer AP courses and Internet connections. Further, educational outcomes for poor and minority students, while improving, are still lower than those of their white counterparts.

This paper examines the success of court-mandated solutions in equalizing spending per pupil across districts serving minority and white students. Other measures related to educational quality and educational outcomes differ substantially. The paper first describes the court rulings that affect the role of the property tax in education finance, examining both the initial equalization decisions and the more recent court decisions that call for an adequacy standard. It also reviews the literature on the impact of school finance reform on overall finances.

The paper then examines changes in finances over time—both within and across states—and evaluates how spending levels have changed for school districts that serve students of different races. Spending differences have largely disappeared. Spending levels across districts have converged; most remaining differences in spending are between rather than within states. Several measures of education resources other than dollars are also presented. Corcoran and colleagues (2004), using national datasets on school conditions, show that the disparity of resources across socioeconomic status and racial groups has improved only slightly.

To close, the paper examines differences in outcomes for students of different races. There is limited evidence of some narrowing of test score gaps across students of different races, but any evaluations are limited by a lack of consistent data measuring other student outcomes over time across states. The lack of national measurement in part comes from the autonomy given to states in defining terms or setting specific targets to be met. For example, states use different measures of graduation rates to satisfy No Child Left Behind (NCLB) rules. New policy proposals attempt going beyond equalization of funds to ensuring an adequate education for all students irrespective of race or income status.

A Short History of School Finance Reform

In the 1960s, critics began to formulate legal challenges to the system of local funding for public schools. They broadly agreed on the source of the problem: local control of key educational decisions had led to significant differences in education spending among districts within states. An early strategy argued that the educational needs of all children must be met and that meeting those needs might require the state to spend more on educating low-achieving, low-income students than on students from affluent, well-educated families. The courts were unsympathetic to this line of argument, concluding that a "needs-based" theory left too many questions unanswered. For example, the Virginia Supreme Court wrote in *Burris v. Wilkerson,* "The courts have neither the knowledge, nor the means, nor the power to tailor the public monies to fit the varying needs of the students throughout the State."

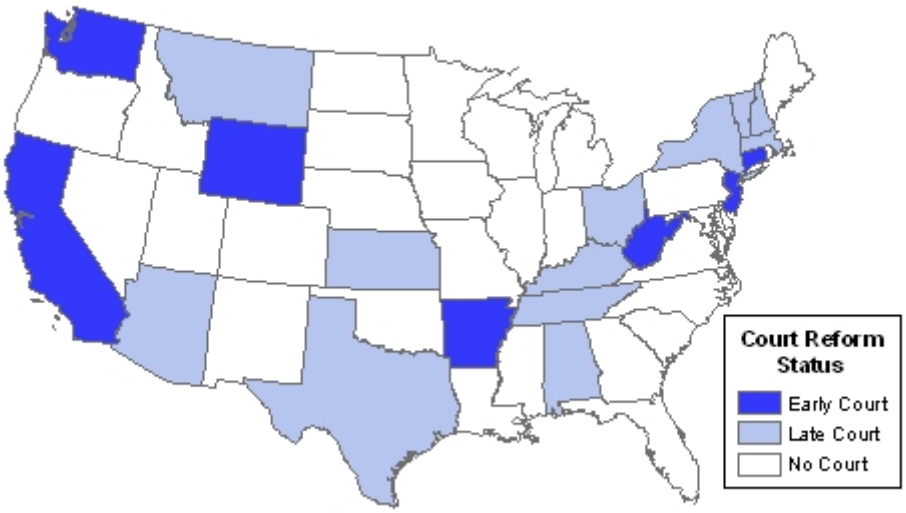
An argument that proved successful in state courts was that poor school districts had little property wealth that they could tax (Coons, Clune, and Sugarman 1970; Minorini and Sugarman 1999). The 1971 *Serrano v. Priest* case in California was the first using the Coons and colleagues principle to be decided for the plaintiffs when the California State Supreme Court declared the state school funding program unconstitutional. The basis of this ruling became known as the "fiscal neutrality" standard. In 1973, in *San Antonio Independent School District v. Rodriguez,* the United States Supreme Court rejected an attempt to establish a similar standard. Following this ruling, school finance reforms were pursued state by state: some states were forced to reform school finances as a result of litigation, while others voluntarily passed legislation equalizing state aid formulas. While almost all these reforms involved redistributing funds between districts, some states simply decided to increase the level of funding for all.

These efforts have increased the state's role in education finance. Murray, Evans, and Schwab (1998) consider the effect of court-mandated school finance reform on the level and distribution of per pupil spending in the United States between 1970 and 1990. They find that court-mandated reform decreased within-state inequality significantly by raising spending at the bottom of the distribution while leaving spending at the top unchanged. Court-mandated finance reform generally leads states to increase spending for education, financed by higher state taxes. (There are some notable exceptions to this statement, namely California, which seems to have leveled down education spending in part because of the interaction between the Serrano decision and Proposition 13, the voter initiative to limit property taxes that was passed in 1978.)

Since the 1990s, many of the challenges to state finance systems have focused on ensuring that all students have equitable access to adequate educational opportunities as required by state education clauses (Minorini and Sugarman 1999). The argument is that some districts do not provide students with an adequate education and that it is the state's responsibility to see that districts receive the funding to enable them to do so. The remedy might require some districts to spend more (perhaps significantly more) than other districts, depending on their student population. For example, in districts with many students from low-income families and families where English is not the first language, an "adequate education" may cost more money, and the state is required to ensure that these needs are met. These new adequacy cases are a rebirth of the "needs-based" claims of the late 1960s.

Figure 1 maps the states with early and late court decisions. "Early court" states reformed their education funding based on the fiscal neutrality standards of the 1970s. "Late court" states reformed their financing often based on the 1990s' adequacy claims.

Figure 1: Timing of Court Reform



An adequacy claim would emphasize outcomes more than a wealth-neutrality or spending-equalization claim would. But there is a second important strand to this emerging adequacy stance. Adequacy typically emphasizes absolute standards of performance, while past equity debates focused on comparisons among children and districts and how well they fared relative to each other in money and inputs. Adequacy claims also involves setting an absolute standard rather than defining equity in terms of the relative spending across systems. Adequacy demands are also reminiscent of federal policy, whereby NCLB sets achievement standards for all subclasses of students.

Differences in District Spending Over Time

To examine changes in spending over time, we calculate three measures of inequality in district-level per pupil education spending by Murray and colleagues (1998) and Corcoran and colleagues (2004), based on data from 1972 to 1997.[1] We calculate the 95/5 ratio, the coefficient

[1] Our primary dataset is the 2002 Census of Governments School System Finance (F-33) file. The survey is conducted by the U.S. Census Bureau in years ending in 2 or 7 on behalf of the U.S. Department of Education's National Center for Education Statistics (NCES). The F-33 file contains revenue, expenditure, and fall enrollment data for all U.S. public school districts and includes 10,489 unified school districts in 46 states. Districts in Alaska; Washington, D.C.; Hawaii; Montana; and Vermont were dropped from the dataset. Alaska has a unique cost situation because of its location. Both Hawaii and Washington, D.C., are single-district systems, making within-state spending comparisons impossible. Only a small percentage of students in Montana and Vermont attend unified school districts. We calculated the unweighted value of 95th percentile and 5th percentile per pupil current expenditures in unified districts for each state. Districts with greater than 150 percent of 95th percentile expenditures or less than 50 percent of 5th percentile expenditures were deleted. In 2002, 91.2 percent of all public school students were enrolled in districts included in our dataset.

of variation, and the Theil index. Each measure increases as imbalance in the distribution of education expenditures rises.[2] Our particular interest is to isolate state-specific disparity in spending from variation across the nation as a whole. We decompose the coefficient of variation and the Theil index into between- and within-state portions. In addition, each measure is calculated for individual states, as well as the nation as a whole. District expenditures are weighted by student enrollment to control for size differences across districts.

Our most straightforward measure is the ratio of spending per pupil in the district that spends at the 95th percentile to the district that spends at the 5th percentile. The 95/5 ratio has a value of 1 when 95th and 5th percentile expenditures are identical.

The coefficient of variation is the standard deviation in district expenditures as a percentage of the mean expenditure in a state. It has a minimum value of 0 if spending levels are the same within the state and increases with growing inequality. It is equally sensitive to transfers between districts, regardless of district differences in per pupil spending levels.

Our final measure is the Theil index, which measures how the distribution of expenditures across districts in a state differs from the distribution of student enrollment. The index equals 0 if every district's share of spending is equal to its share of enrollment. The Theil index is more sensitive to transfers between districts with greater resource-level disparity. An advantage of the Theil index is that the index for the United States can be decomposed to measure per pupil spending inequality between and within states.

Table 1 presents these inequality measures at a national level for every fifth year from 1972 to 2002. We focus on the trend in these measures in relation to the 2002 numbers. Inequality declined sharply and consistently across all measures from 1992 to 2002. In particular, inequality fell from 1972 to 1982, rose over the next five years, was flat over the next period, dipped substantially again from 1992 to 1997, and then was largely flat over the last five years of the sample. Both periods of decreasing inequality largely corresponded to the periods following court activity. Over the entire period from 1972 to 2002, inequality in the national distribution of education expenditures decreased significantly. The Theil index, coefficient of variation, and 95/5 ratio fell by 32, 17, and 20 percent, respectively.

The three subsequent sections of table 1 decompose national variation in education expenditures into within- and across-state components. As seen in the lower half of the table, between-state inequality is a much larger share of overall spending inequality than within-state inequality, and it has increased recently. Across all years, variation in spending across states accounts for roughly two-thirds of inequality at the national level. This proportion has been relatively constant, dropping to around one-half in 1982 but returning to two-thirds by 1987.

The first Theil index decomposition highlights the differing trends in between- and within-state inequality from 1972 to 2002. From 1972 to 1982, spending between states was converging while within-state inequality increased. Following decisions in the first court equalization cases in the 1970s, within-state inequality dropped; this relationship is especially pronounced in states that had early equalization decisions. Within-state inequality declined further from 1992 to 2002. Thus, education spending inequality dropped overall after passage of

[2] See Murray, Evans, and Schwab (1998) or Corcoran et al. (2004) for equations estimated.

the first court decisions, with 70 percent of existing differences in education spending coming from across- rather than within-state variation. Note that some differences in spending per pupil across (and within) states can reflect cost of living differences, so it is not necessarily desirable to equalize spending per pupil across all states. However, much of the decline in between-state inequality has resulted from higher growth rates in per pupil spending by the lowest spending states in 1972.

Table 1. Measures of Inequality in Per Pupil Spending Levels

	1972	1977	1982	1987	1992	1997	2002
Measures of inequality							
95/5 ratio	2.72	2.37	2.22	2.53	2.40	2.10	2.18
Coefficient of variation	30.8	28.1	25.6	29.6	29.9	26.0	25.7
Theil index (x 1,000)	43.7	37.1	31.0	40.7	40.5	30.6	29.7
Theil index decomposition							
Within states	13.7	14.4	14.0	12.6	13.4	9.9	8.7
Between states	30.0	22.8	17.0	28.2	27.1	20.7	21.0
National	43.7	37.1	31.0	40.7	40.5	30.6	29.7
Theil index decomposition (%)							
Within states	31.4	38.8	45.2	31.0	33.1	32.4	29.3
Between states	68.6	61.5	54.8	69.3	66.9	67.6	70.7
National	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Variance decomposition (%)							
Within states	32.2	41.5	47.5	32.8	35.3		30.6
Between states	67.8	58.5	52.5	67.2	64.7		69.4
National	100.0	100.0	100.0	100.0	100.0		100.0

Source (2002 Stats): 2002 Census of Governments: School System Finance (F-33) File (U.S. Bureau of the Census, Department of Commerce).

Notes: Calculated from per pupil current operating expenditures by unified school districts. Excludes data from Alaska, DC, Hawaii, Montana, and Vermont. Each state's unweighted value of 95th percentile and 5th percentile of per pupil expenditure was calculated.

District Spending by Racial Groups

We have not thus far examined the difference in spending levels across students of different races. To examine spending patterns across different populations of students, we compared average per pupil spending across districts weighted by the number of students in each racial or ethnic group. In general, differences in spending per pupil in districts serving nonwhite and white students are very small. In 1972, the ratio of nonwhite to white spending was .98; this trend had reversed by 1982, as spending per pupil for nonwhite students was slightly higher than for white students in most states and in the United States as a whole and has been for the past 20 years (figure 2). Table 2 presents spending per pupil figures for 2002 weighted by the number of students in each subgroup.

Figure 2: Ratio of Non-White to White per Pupil Education Expenditures, 2002

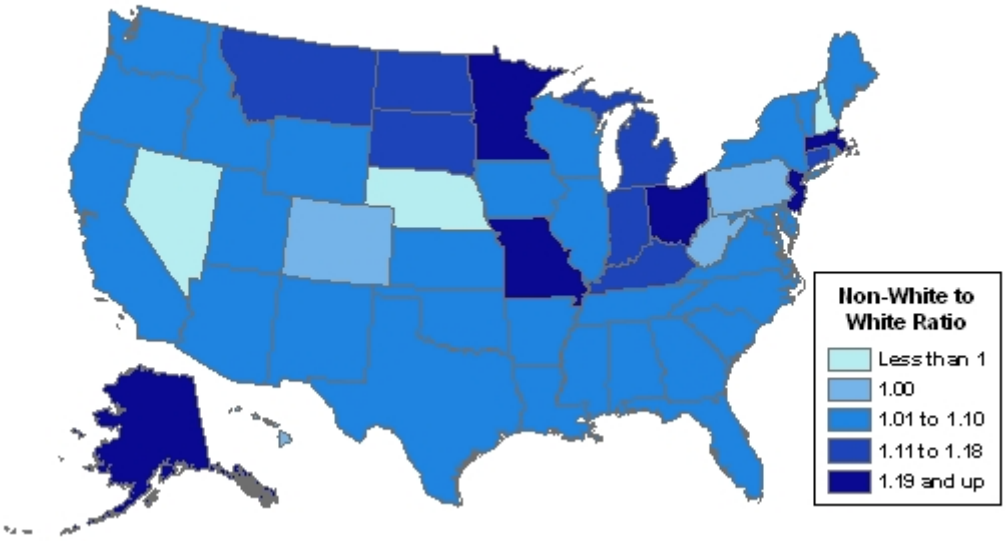


Table 2. 2002 Average District Spending Per Pupil, Weighted by Subgroup Population

State	White	Non-white	Black	Hispanic	Asian/P.I.	Native American	Black: white spending ratio	Non-white: white spending ratio
Alabama	6,050	6,220	6,225	6,147	6,326	6,037	1.03	1.03
Alaska	8,453	11,320	8,074	8,341	8,532	12,991	0.96	1.34
Arizona	5,249	5,680	5,341	5,397	5,240	6,823	1.02	1.08
Arkansas	5,850	6,411	6,511	5,957	6,193	5,946	1.11	1.10
California	6,936	7,156	7,304	7,120	7,160	7,371	1.05	1.03
Colorado	6,811	6,820	6,883	6,800	6,873	6,777	1.01	1.00
Connecticut	9,834	11,089	11,214	11,182	10,202	9,864	1.14	1.13
Delaware	9,075	9,265	9,239	9,338	9,408	9,114	1.02	1.02
DC	13,330	13,330	13,330	13,330	13,330	13,330	1.00	1.00
Florida	5,970	6,151	6,082	6,252	5,999	6,027	1.02	1.03
Georgia	6,930	7,563	7,625	7,274	7,274	7,092	1.10	1.09
Hawaii	7,306	7,306	7,306	7,306	7,306	7,306	1.00	1.00
Idaho	5,945	5,995	6,001	5,870	6,066	6,990	1.01	1.01
Illinois	6,919	7,512	7,571	7,425	7,561	7,204	1.09	1.09
Indiana	7,166	8,212	8,427	7,820	7,372	7,411	1.18	1.15
Iowa	6,821	7,115	7,246	7,039	7,037	6,934	1.06	1.04
Kansas	6,950	7,115	7,249	7,041	6,982	6,973	1.04	1.02
Kentucky	6,233	6,986	7,073	6,526	6,657	6,226	1.13	1.12
Louisiana	6,426	6,608	6,614	6,572	6,586	6,348	1.03	1.03
Maine	8,256	8,642	8,720	8,489	8,769	8,327	1.06	1.05
Maryland	8,278	8,644	8,539	9,022	9,078	8,374	1.03	1.04
Massachusetts	9,535	11,649	12,201	11,453	11,167	10,322	1.28	1.22
Michigan	7,685	8,868	9,065	8,299	8,503	7,949	1.18	1.15

Minnesota	7,148	8,761	9,189	8,188	8,658	8,641	1.29	1.23
Mississippi	5,169	5,565	5,572	5,267	5,508	5,229	1.08	1.08
Missouri	6,450	7,902	8,056	7,102	7,355	6,516	1.25	1.23
Montana	7,463	8,737	7,350	6,975	6,794	9,729	0.98	1.17
Nebraska	7,130	6,938	6,908	6,739	6,936	8,148	0.97	0.97
Nevada	6,163	5,948	5,842	5,957	5,912	6,556	0.95	0.97
New Hampshire	7,841	7,333	7,478	7,040	7,618	7,587	0.95	0.94
New Jersey	10,652	12,678	13,226	12,651	11,175	12,106	1.24	1.19
New Mexico	6,525	6,733	6,219	6,650	6,309	7,252	0.95	1.03
New York	11,503	12,000	12,016	11,991	12,008	11,588	1.04	1.04
North Carolina	6,428	6,546	6,571	6,455	6,606	6,256	1.02	1.02
North Dakota	6,302	7,220	6,366	6,198	6,346	7,604	1.01	1.15
Ohio	7,282	8,922	9,074	8,165	8,176	7,822	1.25	1.23
Oklahoma	5,955	6,200	6,243	6,254	5,841	6,182	1.05	1.04
Oregon	7,111	7,275	7,661	7,190	7,168	7,427	1.08	1.02
Pennsylvania	7,882	7,869	7,965	7,399	8,255	7,867	1.01	1.00
Rhode Island	9,361	9,709	9,714	9,735	9,547	9,881	1.04	1.04
South Carolina	6,742	7,064	7,085	6,846	6,787	6,698	1.05	1.05
South Dakota	6,133	7,130	6,047	6,043	5,980	7,559	0.99	1.16
Texas	6,421	6,560	6,526	6,590	6,297	6,413	1.02	1.02
Utah	4,851	5,103	4,995	5,024	4,904	6,045	1.03	1.05
Vermont	8,983	9,467	9,531	9,220	9,593	8,796	1.06	1.05
Virginia	7,343	7,771	7,466	8,704	8,511	7,525	1.02	1.06
Washington	6,812	7,104	7,250	6,983	7,057	7,446	1.06	1.04
West Virginia	7,621	7,626	7,651	7,466	7,560	7,556	1.00	1.00
Wisconsin	8,384	9,177	9,434	8,948	8,877	8,863	1.13	1.09
Wyoming	8,554	8,982	7,934	8,360	8,295	11,518	0.93	1.05
United States	7,354	7,757	7,921	7,531	8,011	7,577	1.08	1.05

Source (2002 Stats): 2002 Census of Governments: School System Finance (F-33) File (U.S. Bureau of the Census, Department of Commerce).

Note: Calculated from per pupil current operating expenditures by unified school districts weighted by subgroup population in district.

Limitations in District-Level Spending Analysis

The results presented thus far need to be considered with a few caveats. These ratios do not reflect that the costs of educating students of different groups differ and that minority students are often found in urban districts that have higher cost structures. Part of the movement to an adequacy standard in court cases reflects the understanding that equalizing educational attainment or outcomes depends on factors other than money, and it may cost more to reach a given standard for a specific set of students or schools serving different populations.

In addition, although spending differences have lessened between districts, it is unclear whether inequities are lessened at the school level. According to a recent study, the 10 largest school districts in California have spending gaps between high- and low-poverty high schools—from $64,000 to $500,000 per school (Education Trust-West 2005). This problem is not limited to California. A study of Baltimore, Cincinnati, and Seattle indicated district funding differences for high- and low-poverty schools ranging from $400,000 to $1 million (Roza and Hill 2004). These studies identified large disparities in school funding within districts, with schools serving

high-poverty students receiving substantially less district funding. These spending disparities can undermine existing systems trying to close achievement gaps if it means the most at-risk students are not receiving their fair share of highly qualified teachers.

A significant part of the disparities found in spending and staffing across districts is related to staffing rules and the right to transfer and fill jobs districtwide based on seniority or tenure within a district. Districts often allocate a certain number of staff to a school, rather than giving schools a per student amount for staff compensation. As teachers gain experience, they often take advantage of seniority rules to move to more affluent schools where students are perceived as easier to teach (Roza and Hill 2004). This can lead to more experienced teachers clustering at low-poverty schools with vacancies at schools serving underserved populations filled by new teachers. As a result, new teachers (who have much lower salaries than experienced teachers) work disproportionately in schools in the poorest neighborhoods. Because of the large range in staff pay, schools with the highest needs within a district often receive substantially less funding because they employ the least experienced teachers.

Betts, Rueben, and Danenberg (2000) find that although spending per pupil is largely equalized across districts in California, resources (including experience and qualification levels of teachers) vary dramatically across schools serving high- and low-income (and white and nonwhite) students. Schools serving low-income students typically have a larger percentage of inexperienced and noncredentialed teachers, and the variation in teacher qualifications is greater in large urban districts than in the state as a whole. Given that teacher salaries make up about 40 percent of a school district's budget,[3] this difference in experience levels translates into large differences in money spent at the school rather than the district level.

Education Quality Beyond Spending

To examine these differences in inputs, in this section we present several non-financial measures of education resources taken from Corcoran et al., 2004. Specifically, we report five different measures of the school environment from several nationally representative surveys: school safety, quality of physical capital, teacher quality, advanced placement courses, and computer use. In many cases, we have information over time, but in some cases, we only have information at a single point in time.

In table 3, we show the fraction of schools reporting serious violent incidents and the number of these violent incidents per 1,000 students. The data are drawn from the National Center for Education Statistics' (NCES) Principal/School Disciplinarian Survey on School Violence, and the table reports data from the 1996/97 school year. Schools with the largest fraction of minority students are two and a half times more likely to report a violent incident and have five times the incidence rate as schools with the lowest fraction of minority students.

[3] The 40 percent accounts only for teacher direct salaries (excluding benefits); total teacher compensation or all employee salaries make up a much larger percentage of school district budgets.

Table 3. Reported Incidents of Serious Violent Criminal Incidents in Public Schools, 1996–97

	% of schools reporting serious violent incidents	Incidents per 1,000 students
By minority enrollment of school:		
< 5%	5.8	0.2
5–19%	10.9	0.4
20–49%	11.1	0.5
> 50%	14.7	1.0
By percentage of students participating in the free or reduced-price lunch program:		
< 20%	8.6	0.3
21–34%	11.7	0.6
35–49%	11.6	0.5
50–75%	8.9	0.7
> 75%	10.2	0.8

Source: Corcoran et al. (2004).

Note: Serious violent crimes include murder, rape or other type of sexual battery, suicide, physical attack or fight with a weapon, or robbery.

In table 4, we report selected quality characteristics of school facilities (overcrowding, age and adequacy of the physical structure) by the school's poverty status (as defined by the percentage of students eligible for the free or reduced-price lunch program in 1999). The data are from NCES's Fast Response survey "Condition of Public School Facilities." As table 4 shows, in the highest poverty schools—those where more than 70 percent of the students are eligible for the free and reduced-price lunch program—overcrowding is particularly severe. Twelve percent of these schools reported being more than 25 percent over capacity, compared with 8 percent of low-poverty schools. Similarly, 21 percent of the highest poverty schools were located in buildings more than 35 years old compared with 15 percent of low-poverty schools. Principals in high-poverty schools were far more likely to report problems with the roof, plumbing, or heating/AC system than were principals in low-poverty schools. Thus, the schools in the highest poverty setting tend to have the worst physical capital.

Table 4. Characteristics of Capital Quality of Public Schools, 1999

	Percentage of students eligible for the free or reduced-price lunch program			
	< 20%	20–39%	40–69%	> 70%
Percentage of schools that are				
6–25% over capacity	16	13	16	12
> 25% over capacity	6	8	7	12
> 35 years old	11	15	11	21
Percentage that have less than adequate				
Roofs	18	21	22	32
Plumbing	23	23	23	32
Heating, ventilation/AC	28	26	29	35

Source: Corcoran et al. (2004).

Research is beginning to uncover some of the factors associated with teaching quality, including teacher experience, academic ability, and subject matter expertise. At the same time, we are also learning about the maldistribution of teachers across districts, schools, and classrooms within schools (Betts et al. 2000; Clotfelter, Ladd, and Vigdor 2005). At each level, students with the greatest need—typically minority and low-income students—are much more likely to have the least effective teachers. The uneven distribution of quality teachers, and the strong findings about the importance of quality teachers, especially for disadvantaged students, is creating pressure for new policies focused on the recruitment, retention, and assignment of teachers.[4]

Table 5 looks at a cross-section of schools from the 1993–94 Schools and Staffing Survey (SASS) to see how the characteristics of newly hired teachers differ across schools. SASS is a periodic survey conducted by the NCES that collects data from a nationally representative sample of public and private schools on characteristics and views of school personnel. Looking at new teachers, defined as those with two or fewer years of experience, table 5 shows that while average base-year salaries vary little between schools with different concentrations of minority students, the qualifications and job satisfaction of new teachers across these schools varies greatly. For example, in 1993–94, new teachers in schools where 90 percent or more of the students were minority were less likely to be certified in their primary teaching field than new teachers in schools that had 10 percent or fewer minority students. Teachers in primarily minority schools were more than five times as likely as teachers in primarily white schools to state that they "definitely plan to leave teaching as soon as possible" when asked how long they expected to teach. Differences in the qualifications of new teachers are even more striking when comparing across schools with different proportions of students in poverty.

Table 5. Characteristics of Newly Hired Teachers by Race of School, from Schools and Staffing Survey 1993–94

Percent of school enrollment that is black:	All	0–10%	10–50%	50–90%	90+%
Sample size	3,643	2,656	696	181	110
Average years of experience	1.48	1.48	1.49	1.49	1.51
Percent certified in primary teaching field	91.4	93.8	88.8	87.3	86.8
Percent with bachelor's degree or higher	99.5	99.4	99.7	99.8	99.7
Percent with master's degree or higher	16.7	15.6	15.1	26.2	28.4
Percent teaching full-time	86.0	83.6	88.1	94.7	94.2
Percent who say they would teach again	77.3	81.3	73.1	66.3	60.7
Percent who plan to exit teaching as soon as possible	2.5	1.6	2.2	8.2	9.1
Percent who plan to exit teaching at first opportunity	14.3	13.1	12.9	27.2	21.7
Average academic base-year salary ($)	23,083	22,741	23,509	23,943	24,209

Source: Corcoran et al. (2004).

Note: "Newly hired teachers" are teachers with two or fewer years of experience.

Table 6 uses three large NCES longitudinal surveys to examine the availability of advanced placement (AP) courses. The datasets are the National Longitudinal Survey of 1972, High School and Beyond Senior Class of 1982 and the National Educational Longitudinal

[4] There are also counter-pressures, for example, from vocal middle-class parents for particular teachers for their children and from experienced teachers who threaten to leave if they do not receive their preferred teaching assignments.

Survey. The entries in table 6 represent the fraction of schools that offer one or more advanced placement courses. While all schools made significant gains in AP offerings, schools with majority-black and majority-disadvantaged student populations were much less likely to offer these courses than largely nonblack or nonpoor schools. For example, in 1972, students in schools where at least 90 percent of the students are black were 30 percent less likely to have the opportunity to take AP courses than students in schools where less than 10 percent of the students were black. By 1992, however, these schools had made large strides in course offerings, and black students were about as likely to have AP courses offered at their schools as were white students. Stark differences remained between rich and poor schools in 1992, however. As table 6 shows, 39 percent of the schools where at least 90 percent of the students were eligible for free or reduced-price lunch offered AP courses; in contrast, 84 percent of the schools where no more than 10 percent of the students were poor offered such classes.

Table 6. Fraction of Schools Offering Advanced Placement Courses by Race and Income Composition of School

Category	High School Class of		
	1972	1982	1992
All schools	31.0	48.3	76.4
By percentage black:			
0–10%	30.0	45.6	72.8
10–50%	36.0	57.6	84.0
50–90%	23.9	50.0	77.9
90–100%	21.4	41.9	76.7
By percentage qualified for free or reduced-price lunch:			
0–10%	38.9	52.0	84.2
10–50%	20.6	46.0	74.2
50–90%	8.3	34.4	69.0
90–100%	0.0	26.7	38.5

Source: Corcoran et al. (2004).

In table 7, we report the fraction of schools and classrooms with Internet access. As shown in the first row of that table, although only 33 percent of schools had access to the Internet in 1994, 98 percent has access by 2000. Given the high fraction of schools with Internet access, it should come as no surprise that there is little variation in Internet access across schools with different characteristics. For example, schools with a high fraction of minority students or a high fraction of students receiving free or reduced-price lunch still had Internet access rates above 94 percent.

In the bottom half of table 7 we report the fraction of *classrooms* wired for the Internet. The fraction of classrooms with Internet access has increased dramatically in all schools. In schools where more than 50 percent of students were minority, the fraction of wired classrooms increased to 64 percent in 2000. However, this number is 21 percentage points below the rate for classrooms with less than 6 percent minority students. This disparity only touches on the digital divide by race: NCES indicates a number of other quality differences between schools with different socioeconomic characteristics, including differences in the speed of the connection, training of the teachers, and the number of computers.

Table 7. Percentage of Schools and Classrooms with Internet Access, 1994–2000

	1994	1995	1996	1997	1998	1999	2000
	Percent of Schools						
All schools	35	50	65	78	89	95	98
By percentage minority enrollment:							
(1) < 6%	38	52	65	84	91	95	98
(2) 6–20%	38	58	72	87	93	97	100
(3) 21–49%	38	55	65	73	91	96	98
(4) > 50%	27	39	56	63	82	92	96
Difference (1) - (4)	11	13	9	21	9	3	2
	Percent of Classrooms						
All classrooms	3	8	14	27	51	64	77
By percentage minority enrollment:							
(1) < 6%	4	9	18	37	57	74	85
(2) 6–20%	4	10	18	35	59	78	83
(3) 21–49%	4	9	12	22	52	64	79
(4) > 50%	2	3	5	13	37	43	64
Difference (1) - (4)	2	6	13	24	20	31	21

Source: Corcoran et al. (2004).

The NCES data provide information on the *availability* of computers in schools; they do not, however, tell us anything about actual usage. Fortunately, data on computer use has been collected in the October School Enrollment supplement of the Current Population Survey (CPS). The CPS is a monthly survey of approximately 50,000 households conducted by the Census Bureau. Its primary purpose is to collect information on the size and characteristics of the labor force. Each October, the CPS administers the school enrollment supplement that collects educational attainment and enrollment information for both adults and children in the household. The 1984, 1987, 1993, and 1997 supplements also include questions about computer use at home, school, and work.

The results from the CPS show that although computer use in school has increased considerably for all groups, significant differences remain. In 1984, computer use by white, non-Hispanic students was 18 percentage points higher than for blacks and almost 20 percent higher than for Hispanics. Over the next 13 years, computer use in school by these minority groups more than tripled, with the difference in use rates cut in half for blacks but showing little progress for Hispanics.

Does Money Matter? Do School Finance Reforms Make a Difference?

The debate over whether the level of education spending affects outcomes is long, contentious, and ongoing. Hanushek (1986, 1997) summarizes the existing "education production function" literature by stating "there appears to be no strong or systematic relationship between school expenditures and student performance" (1986, 1162). However, recent work including Ladd and Ferguson (1996) shows that properly specified econometric models do find that additional resources generate better outcomes. Others have argued that measures other than test scores should be considered in the debate. Card and Krueger (1992a, 1992b) provide some important direct evidence that increases in education spending raise the rate of return to education. However, Betts (1995), using data from the NLSY, finds no evidence that increases in spending

in schools raises student future wages. Given the state of this literature, trying to untangle the connections between spending and outcomes is difficult.

While evidence generally shows that school finance reforms have narrowed the spending discrepancies within states and, to an extent, across states (Murray et al. 1998), the evidence of how student outcomes have changed following these reforms is murky. Downes (1992) looks at the California experience following *Serrano*. He finds greater equality in spending was not accompanied by greater equality in measured student performance. Using nationwide individual student data, Downes and Figlio (1997) find court-mandated school-finance reforms do not significantly change either the mean level or the distribution of student performance on standardized tests. They do find, however, that legislative reforms that are not a result of a court decision lead to higher test scores in general; the estimated effect is particularly large in initially low spending districts. Hoxby (2001) finds little evidence that school finance would significantly affect the high school dropout rate. Finally, Card and Payne (1998) focus on the impact of finance reform on SAT scores. They conclude that the evidence points to a modest equalizing effect of school-finance reforms on the test score outcomes for children from different family backgrounds, though they would agree that the evidence is not decisive.

Understanding how these changes translate into student outcomes is further complicated by a lack of consistent data over time on student achievement for different groups of students. The passage of the accountability rules for NCLB has led to information being collected across states (including graduation rates and student achievement measures), but these measures are inconsistent across states and, even within a state, change over time. Some of the best new research involves examining student achievement using state-specific databases where students can be followed over time and linked to teachers. But the magnitude of the teacher effect has only recently been fully understood. After examining these questions using data on Texas, Rivkin, Hanushek, and Kain (2005, 419) find "large differences among teachers in their impacts on achievement and show that high quality instruction through primary school could substantially offset disadvantages associated with low socioeconomic background."

Student Achievement by Race

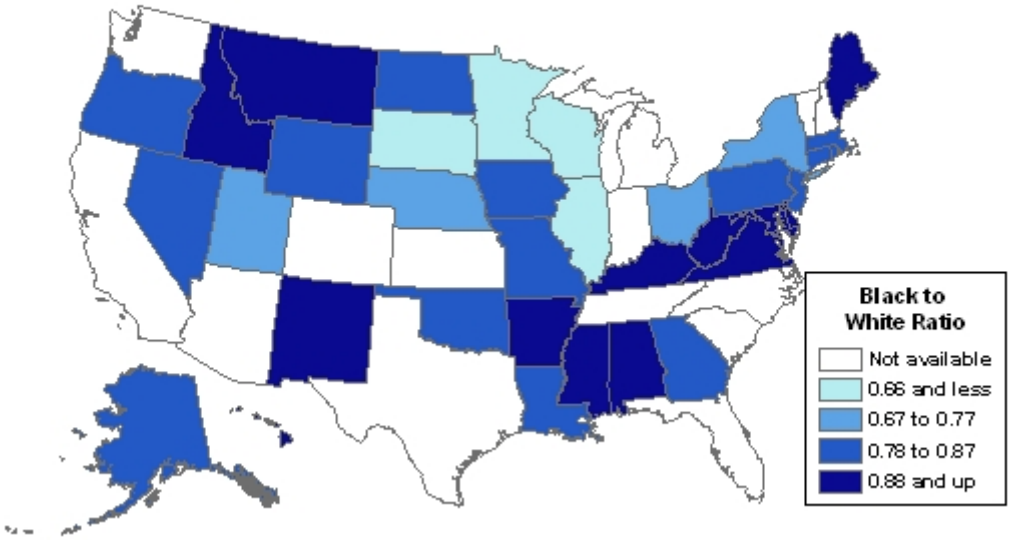
The effects of court reforms on student achievement have been mixed, but has the gap between white and nonwhite students been closing? Much research has documented the disparities in student achievement between white and black students. Differentials by race are often entangled with differences in other family characteristics (income, parental education) that also affect student achievement. Researchers have found that these gaps in achievement often predate attendance in school and persist into adulthood.[5] As measured by the National Assessment of Educational Progress (NAEP) test scores, there has been a narrowing in the achievement gap since 1970 even as overall test scores are improving for students. For example, white 4th grade students had an average scale score of 246 on the math test in 2005, compared with 220 for black students and 226 for Hispanic students. In 1990, average test scores were 220, 188, and 200 for white, black, and Hispanic students, respectively. Test score gaps are larger for 8th graders than for 4th graders, and achievement gaps seem to usually increase over time.

[5] See, for example, Jenks and Phillips (1998) and Fryer and Levitt (2004) for a description of multiple studies.

In contrast to earlier studies, Fryer and Levitt (2004) find that test score gap of entering students can be explained by controlling for covariates including child's age, child's birth weight, socioeconomic measures, mother's age at first birth, and number of children's books in the home. They posit that differences in results may reflect real gains in recent cohorts of students. They do find, however, that the test score gap reappears in the first two years of school, especially for black students, and they don't reject a hypothesis of the difference coming from lower-quality schools. It is also important to note that some variables that close the entering test score gap (such as books in the home) suggest that altering a child's home environment and early exposure to learning may increase school achievement.

Black and Hispanic students also have higher dropout rates than white students. It is more difficult to tell if this gap has been closing over time as state definitions of graduation rates have varied over time and across states. Figure 3 maps the ratio of four-year high school completion rates for black and white students in 2002. Note that information on graduation rates by racial or ethnic group is unavailable for some states (including California and the District of Columbia) that serve a large share of minority students. Thus, there seems to be some closing of the test score gap over time but little evidence that differences are related to changes in education finance.

Figure 3: Ratio of Black to White Four-Year High School Completion Rates, 2000-01



Conclusions and Policy Implications

Differences in spending per pupil have diminished over the past 38 years in the aftermath of court cases, but significant variation still exists. Further, there is little evidence that these efforts have directly affected student achievement. There has been some closing of test score gaps between black and Hispanic students and white students and greater availability of AP courses. States are moving beyond equalization to ensure that each student receives an adequate education.

Are there programs that might help achieve the goal of equal and adequate achievement for all students? While there is no panacea, a number of programs or changes seem to offer returns and gains for minority students.

Although the variation in district spending has decreased, spending at the district level does not necessarily translate into actual dollars spent in a specific classroom or school. As noted earlier, districts typically price teachers at an average salary rate, and salary dollars spent do not enter a school's budget constraint. Thus, some schools in a district can have a more experienced and costly teaching force while others have newer teachers. While these disparities come about through seniority rules for transfers and district pricing policies, they can and often do lead to predominantly inexperienced teaching forces at minority, high-poverty schools. If each school within a district faced actual costs, then each would have to decide on what budget choices would work best to educate the students within the school. Indeed, partnered with funding mechanisms that allocate money per pupil and consider the higher costs to educate certain students or the specific costs of certain schools (say, additional funds for security or counselors if needed), these policies could lead to more equalized spending *within* districts and a different distribution of experienced teachers.

School-based budgeting is receiving growing levels of attention as a way to mitigate inequities among schools. The Thomas Fordham Institute has launched the "100 percent solution," which advocates for school-based budgeting using weighted student funding and has a group of high-profile bipartisan signatories (Thomas B. Fordham Institute 2006).

An alternative policy would be to try to target bonus pay to high-quality teachers who are willing to teach in high-poverty or low-performing schools. Under this policy, we must determine how to measure quality (no easy task) and whether we can move beyond assuming experience increases teacher performance to measuring teacher quality through student test scores or principal assessments. Programs that earmark extra funds to attract teachers to specific schools also need to make sure this money is correctly targeted.

Another policy option being considered as part of some adequacy programs is to focus money and effort on pre-kindergarten programs. There is some evidence of long-term gains from early intervention. Focusing resources on children before they enter school or during the summer might help close the achievement gaps still faced by students.

There could also be a role for federal intervention if it is perceived that across-state differences in spending matter. However, given the limited relationship between aggregate spending and student achievement, it is unclear that this would help. Current achievement gains might be related to additional federal regulations as part of NCLB, and there might be a role for the federal government to better design and collect information on how students fare across the country. For example, federal requirements of consistent measurement of graduation rates would help researchers better understand if some subgroups are being left behind. Indeed, Secretary of Education Margaret Spellings has recently called for a uniform definition of graduation rates and dropouts across states and that data be available to disaggregate this information across student populations.

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