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The Equality of Public School District Funding in the United States: A National Status Report

For over 30 years, the distribution of educational opportunities and the equality of education funding across communities has generated considerable interest among policy makers, the public, and the courts. This article takes advantage of national data sets to examine funding equality across school districts in 49 states for fiscal years 1992 and 1995. It presents rankings of each state's funding equality and explores factors that may be related to the level of equality within states and to changes across years.

The analyses suggest that, overall, within-state equality improved slightly between 1992 and 1995, although most states' relative rankings changed little during the period. States with fewer school districts relative to students tended to have a more equal distribution of education dollars than states with more districts. States with higher proportions of revenues provided by state governments generally showed a more equitable distribution of resources than states in which districts were more dependent on local revenues.

Public education is the largest area of state and local government spending in the United States, accounting for almost one-fifth of direct state and local government expenditures in 1996 (*Statistical Abstract of the United States* 1999, table 504). Given the enormous resources involved and—more importantly—the critical private and societal benefits that education produces, the distribution of educational opportunities across communities has generated considerable interest among policy makers, the public, and the courts. This article takes advantage of national data sets to examine the equality of education funding across school districts in 49 states for fiscal years 1992 and 1995.[1] It presents rankings of each state's funding equality and explores factors that may be related to the level of equality within states and to changes across years.

The focus of this article is the equality of revenues that are available to school districts within states, one of a number of broad goals of education financing systems. In recent years, policy initiatives and court cases in many states have focused on other goals, such as eliminating the relationship between local property wealth and education spending or achieving an adequate level of funding for all students. Still, ensuring equality of resources across school districts (often referred to as "horizontal equity") remains a fundamental benchmark in evaluating state education funding systems, and it continues to be an important concern of the public and the broad education community.

Comparing the national averages of a number of intrastate equity measures, our results show that the equality of the distribution of education revenues improved slightly between 1992 and 1995. Relative equity rankings for most states changed little between 1992 and 1995, however. Our analysis of univariate equity measures suggests that states with fewer school districts relative to students tended to have a more equal distribution of education dollars than did states with more districts, although states with a greater

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number of districts had somewhat larger improvements across the two years. We also found a weak but significant relationship between intrastate equity and median revenues for education, with lower-revenue states tending to have a more equal distribution of resources. Finally, states with higher proportions of revenues provided by state governments generally showed a more equitable distribution of resources than did states that were more dependent on local revenues.

The Role of Equity in School Finance

Concerns over the equality of educational opportunity date back well over 40 years. In 1954, the U.S. Supreme Court's decision in *Brown v. Board of Education* (347 U.S. 483 [1954]) overturned the long-standing system of separate educational institutions for whites and African Americans, ruling that "separate but equal" schools are inherently unequal. The country's awakening to the perils of unequal access to employment and education helped bring about the enactment of three important pieces of federal legislation related to education: the Civil Rights Act of 1964, the Economic Opportunity Act of 1964, and the Elementary and Secondary Education Act of 1965. The latter act created new federal funding (Title 1) for "at-risk" pupils, while the Civil Rights and Economic Opportunity acts more broadly addressed poverty and discrimination in society. The Civil Rights Act, in particular, is important for proponents of educational equity because it required a study of the factors leading to unequal educational opportunity. A team of researchers led by James Coleman conducted the study, which produced a long line of quantitative research examining the factors, including dollars and the resources they buy, that might affect student achievement (see Coleman et al. 1966; Hanushek 1972, 1981, 1989; Murnane 1975; Hedges, Laine, and Greenwald 1994).

While the debate about whether (and how) money matters to educational achievement continues among researchers (Hanushek 1989; Hedges, Laine and Greenwald 1994), courts in virtually every state have addressed the constitutionality of funding disparities across districts within states. Beginning with California's 1971 *Serrano v. Priest* (5 Cal. 3d 584, 487 P.2d1241, 69 Cal. Rptr. 601 [1971]) case,[2] in which that state's highest court ruled that a child's education could not depend on the wealth of the child's parents or neighbors, state supreme courts in 19 states have invalidated state systems of funding public education (Minorini and Sugarman 1999). While the U.S. Supreme Court ruled five to four in *San Antonio School District v. Rodriguez* (411, U.S. 1 [1973]) that the Texas school-finance system did not violate the Fourteenth Amendment of the U.S. Constitution, plaintiffs continued to use the equal opportunity clauses in state constitutions, along with other education clauses that focus on efficiency and adequacy, to support their claims in state courts.[3]

School-finance equity has been a particularly intractable issue in many states because of the traditional reliance in the United States on a combination of state and local funding, with the relative share of total funding provided by each level of government varying considerably across states.[4] With the majority of local revenues raised through property taxes, vast differences in property wealth across localities typically result in large disparities in education spending. In many cases, these differences may be unrelated to any differences in local "taste" for education. Responsibility for equalizing these disparities has rested with state governments, which have developed a variety of intergovernmental grant schemes intended to promote equity in education spending (see Odden and Picus 1992 and Monk 1990, for an overview of common intergovernmental grants for education). State government defendants in school-finance suits often argue that spending differences are related to local taxing and spending decisions, or that these differences are irrelevant because there is no convincing evidence linking higher spending to improved student achievement. Courts have typically rejected these arguments, though, and have often ordered tight limits on spending differences across districts.[5] The Supreme Court's *Rodriguez* decision returned school-finance litigation to state courts, resulting in state-by-state analyses of equity and the constitutionality of state funding systems. Studies of more recent court cases and legislative initiatives in states such as Georgia, Kansas, and Michigan, suggest that slight improvements in funding equality have occurred in selected states (Rubenstein, Doering, and Gess 2000; Johnston and Duncombe 1998; Fisher 1996).

While these and numerous other studies have focused on funding changes and the distribution of resources in individual states, relatively little work has been done to examine equity from a national perspective and to compare within-state disparities across the country. There are several notable exceptions: Schwartz and Moskowitz (1988) and Wyckoff (1992), for instance, examine changes in intrastate equity in 1977–85 and 1980–87, respectively. Wyckoff found that equity gains were greatest in states with large increases in expenditures over the period. Similarly, Evans, Murray, and Schwab (1997) study the impact of judicial and legislative activity on within-state equity over a 20-year period and find that states where the funding system was found unconstitutional had larger increases in state spending and greater improvements in equity than did states with purely legislative efforts. Other recent work (Hertert, Busch, and Odden 1994; Parrish and Fowler 1995; General Accounting Office 1997; Parrish, Hikido, and Fowler 1998) using National Center for Education Statis-

tics (NCES) data for 1992 indicates that, although state and federal revenues help to improve the equity of funding across districts, persistent inequalities remain; most often, these inequalities are related to differences in property wealth and income. Odden and Clune (1998) point out, however, that recent state court decisions have shifted the focus of litigation from the relationship between spending and property wealth to a more stringent emphasis on reducing per-pupil spending disparities.

The relative paucity of national research in this area is the result, in part, of a lack of readily available data on revenues and expenditures in each of the nation's almost 15,000 school districts. The NCES (part of the U.S. Department of Education), along with the Bureau of the Census, has been working to fill this void by collecting and releasing district-level financial data for the population of U.S. public school districts. The analyses presented here use NCES data for the 1991–92 and 1994–95 school years (the most recent years for which financial data for all districts were available) to examine the dispersion of state and local revenues for education within states. We also explore a number of factors within the control of state policy makers that may be related to the level of funding equality within states. In addition, we have indexed the dispersion statistics for each state relative to the national average to facilitate comparisons across states, and we have created a single composite measure to rank each state's relative equality for each year.[6] (Appendix A presents a more detailed description of the measures and methodology used in the analyses.) From these analyses, we draw conclusions about the status and trends for school-finance equity in the United States.

Equity Results and Trends

Equity is a relative rather than an absolute concept, and it can be defined and measured in a variety of ways. Berne and Stiefel (1984), in their groundbreaking work on school-finance equity, set out a three-part framework for defining equity: horizontal equity, vertical equity, and equal opportunity. In this study, we focus on the first of these concepts, horizontal equity. Defined as the equal treatment of equals, horizontal equity examines the dispersion of per-pupil resources across districts or schools. Greater equality of per-pupil funding indicates higher levels of horizontal equity.[7]

Comparing the national averages of the dispersion measures, the data indicate that funding equality improved slightly between 1992 and 1995 (see table 1). For the McLoone index, a higher value indicates a higher level of equity. For all other measures, lower values reflect a more equal distribution of resources. All measures show a slightly more equitable distribution of revenues in 1995. For example, the national average of the Gini coefficient fell from .093 to .085, and the federal range ratio fell from .684 to .620. While there are no generally accepted standards against which to judge these measures, Odden and Picus (1992) suggest benchmarks of .10 or lower for the coefficient of variation and the Gini coefficient, and .90 or higher for the McLoone index, as representing "acceptable" levels of horizontal equity. Nationally, the mean Gini coefficient and McLoone index achieved this benchmark in both years. However, the coefficient of variation, which improved slightly from .204 to .190 between the two years, did not achieve the benchmark. In fact, in 1992, only three states (Florida, Kentucky, and West Virginia) reached the benchmark for the coefficient of variation, while two states (Florida and West Virginia) achieved the benchmark in 1995.

Horizontal-Equity Index

The multitude of measures available to assess horizontal equity can be both a strength and weakness of the analysis. The measures allow researchers and policy makers to take a broad view of resource distribution and to avoid problems that may arise from reliance on a single, possibly misleading statistic. As the preceding discussions may demonstrate, however, the array of measures can also complicate the analysis, making the results difficult to summarize. The problem is exacerbated when numerous objects of analysis are used, such as multiple revenue or expenditure variables, or real and nominal data. To address this issue, we have created indexed values of the four dispersion measures (see appendix A for a description of each). Each measure for each state is set relative to the unweighted mean value for all states and multiplied by 100. A single summary statistic is calculated for each state by averaging the four indexes.[8] Thus, the national average (which is set to 100 by construction) becomes a benchmark of sorts, with each state compared to all others and to the nation. All indices are created so that higher values indicate a *less equal* distribution of resources. For example, in 1992, Florida had the lowest index and therefore the most equitable distribution, while Missouri had the highest index and least equitable distribution (see table 2). In 1995, West Virginia had the most equitable distribution and Alaska the least equitable.

The mean index facilitates comparisons of each state's equity relative to other states and over time. In 1992, 27 states were equal to or better than the national average, while 22 states were worse (see table 2). In 1995, 29 states were equal to or better than the national average, while 20 were worse. Only Rhode Island (ranked 16) and Illinois (46) had the same ranking in both years, but most state rankings changed little between the two years (Spearman rank correlation coefficient = .82). Clearly, each state faces

Table 1 Interdistrict Equity Measures: State and Local Revenues per Pupil, FY 1992 and FY 1995

State	1992 Federal range ratio	1992 Coefficient of variation	1992 Gini coefficient	1992 McLoone index	1995 Federal range ratio	1995 Coefficient of variation	1995 Gini coefficient	1995 McLoone index
Alabama	0.581	0.161	0.077	0.918	0.428	0.151	0.070	0.932
Alaska	0.795	0.274	0.128	0.938	1.191	0.625	0.154	0.993
Arizona	0.871	0.204	0.093	0.923	0.814	0.199	0.087	0.914
Arkansas	0.597	0.159	0.068	0.944	0.461	0.116	0.061	0.948
California	0.626	0.328	0.097	0.888	0.601	0.344	0.099	0.911
Colorado	0.396	0.185	0.073	0.921	0.595	0.168	0.083	0.927
Connecticut	0.717	0.182	0.086	0.916	0.631	0.175	0.086	0.921
Delaware	0.681	0.369	0.103	0.943	0.685	0.180	0.078	0.928
Florida	0.291	0.093	0.047	0.957	0.320	0.095	0.049	0.924
Georgia	0.636	0.157	0.082	0.901	0.606	0.137	0.071	0.927
Idaho	0.502	0.159	0.078	0.935	0.512	0.156	0.075	0.958
Illinois	1.318	0.317	0.143	0.893	1.095	0.272	0.126	0.851
Indiana	0.424	0.138	0.069	0.920	0.348	0.104	0.055	0.939
Iowa	0.456	0.140	0.065	0.949	0.295	0.106	0.049	0.949
Kansas	0.769	0.216	0.107	0.903	0.786	0.276	0.115	0.933
Kentucky	0.233	0.077	0.043	0.936	0.304	0.107	0.051	0.919
Louisiana	0.408	0.117	0.059	0.899	0.513	0.136	0.072	0.904
Maine	0.683	0.211	0.101	0.904	0.751	0.235	0.104	0.910
Maryland	0.503	0.133	0.074	0.921	0.598	0.137	0.073	0.923
Massachusetts	0.873	0.242	0.114	0.899	0.805	0.201	0.106	0.894
Michigan	0.894	0.201	0.105	0.905	0.623	0.158	0.082	0.918
Minnesota	0.426	0.156	0.074	0.921	0.417	0.211	0.073	0.936
Mississippi	0.423	0.131	0.072	0.923	0.406	0.110	0.062	0.926
Missouri	1.394	0.412	0.183	0.864	1.044	0.265	0.125	0.900
Montana	1.539	0.427	0.188	0.897	1.138	0.317	0.146	0.905
Nebraska	0.877	0.247	0.118	0.899	0.843	0.229	0.110	0.914
Nevada	0.634	0.217	0.080	0.936	0.274	0.171	0.039	0.971
New Hampshire	1.064	0.257	0.129	0.894	1.006	0.256	0.128	0.885
New Jersey	0.780	0.231	0.101	0.898	0.711	0.182	0.090	0.901
New Mexico	0.637	0.177	0.068	0.971	0.562	0.171	0.072	0.906
New York	0.942	0.262	0.135	0.817	0.806	0.231	0.120	0.831
North Carolina	0.446	0.121	0.065	0.935	0.430	0.107	0.058	0.929
North Dakota	1.040	0.269	0.129	0.867	0.921	0.250	0.124	0.865
Ohio	0.767	0.296	0.115	0.880	0.704	0.193	0.094	0.894
Oklahoma	0.691	0.194	0.087	0.926	0.461	0.150	0.064	0.951
Oregon	0.658	0.178	0.092	0.896	0.398	0.143	0.064	0.922
Pennsylvania	0.577	0.140	0.073	0.929	0.472	0.134	0.072	0.929
Rhode Island	0.500	0.133	0.069	0.915	0.543	0.124	0.064	0.945
South Carolina	0.458	0.111	0.060	0.945	0.440	0.120	0.063	0.942
South Dakota	0.853	0.249	0.120	0.881	0.757	0.213	0.097	0.869
Tennessee	0.699	0.178	0.095	0.863	0.369	0.116	0.061	0.913
Texas	0.613	0.196	0.081	0.926	0.652	0.392	0.102	0.914
Utah	0.358	0.174	0.072	0.956	0.388	0.156	0.068	0.894
Vermont	1.361	0.301	0.160	0.816	1.404	0.302	0.164	0.832
Virginia	0.710	0.182	0.099	0.894	0.562	0.150	0.082	0.900
Washington	0.412	0.150	0.064	0.927	0.369	0.139	0.060	0.934
West Virginia	0.263	0.097	0.048	0.951	0.309	0.090	0.046	0.944
Wisconsin	0.427	0.120	0.061	0.946	0.360	0.109	0.057	0.949
Wyoming	0.699	0.304	0.116	0.950	0.664	0.194	0.093	0.914
Mean	0.684	0.204	0.093	0.913	0.620	0.190	0.085	0.917

Source: Common Core Data, National Center for Education Statistics.

a unique set of political, legal, and economic circumstances that may affect changes (or lack of changes) in its relative equity over time. But the availability of national financial data allows analysts to view each state in a national context rather than in isolation.

Horizontal Equity by Number of Districts

One factor within the control of state and local policy makers is the number of school districts in a state. One might expect that as the number of districts increases—particularly if the average size of districts also declines—greater differences may arise across localities as people sort themselves among communities. These interdistrict differences are likely to affect districts' abilities to raise revenues for education, as some communities will have smaller tax bases or citizens who desire a lower level of education spending.[9] Conversely, fewer larger districts within a state may discourage sorting, resulting in fewer revenue disparities.

To examine whether horizontal equity is related to the number of school districts in a state, we divided the states into quartiles based on the number of school districts in each state per 10,000 students (table 2).[10] In both years, the state of Maryland had the fewest school districts per 10,000 students, while the state of Montana had the most. As expected, the results of the analyses suggest that states with fewer school districts (less than 1.87 per 10,000 students) tend have a more equitable distribution of education dollars than do states with more districts. In addi-

Table 2 Intrastate Equity Measures by Districts per 10,000 Students by Quartile, 1992 and 1995

State	1992 Districts per 10,000 students	1992 Mean index	1992 Rank of mean index	State	1995 Districts per 10,000 students	1995 Mean index	1995 Rank of mean index
1st Quartile				**1st Quartile**			
Maryland	0.31	77	17	Maryland	0.30	90	22
Florida	0.35	47	1	Florida	0.32	66	2
Nevada	0.80	90	23	Nevada	0.68	72	7
Louisiana	0.87	74	13	Louisiana	0.83	85	20
Utah	0.88	66	7	Utah	0.85	82	15
North Carolina	1.08	67	8	North Carolina	1.03	75	9
Virginia	1.31	106	30	Virginia	1.25	92	24
South Carolina	1.45	62	5	Georgia	1.42	90	21
Georgia	1.55	93	24	South Carolina	1.43	79	13
Tennessee	1.65	112	33	Tennessee	1.59	74	8
West Virginia	1.72	48	3	Alabama	1.75	84	19
Alabama	1.78	85	21	West Virginia	1.77	64	1
Delaware	1.86	114	36	Delaware	1.78	101	30
Quartile mean	1.20	80		Quartile mean	1.15	81	
2nd Quartile				**2nd Quartile**			
California	1.98	121	39	California	1.91	125	40
Rhode Island	2.62	77	16	Rhode Island	2.46	84	16
New York	2.63	155	45	New York	2.53	123	38
Kentucky	2.78	48	2	New Mexico	2.74	92	25
New Mexico	2.88	72	9	Colorado	2.75	97	28
Colorado	2.97	80	20	Kentucky	2.75	67	4
Mississippi	2.98	73	11	Texas	2.85	134	43
Pennsylvania	3.01	78	19	Pennsylvania	2.87	84	17
Texas	3.02	89	22	Arizona	2.88	111	34
Indiana	3.08	74	12	Mississippi	2.97	75	10
Arizona	3.25	104	28	Indiana	3.02	70	5
Washington	3.42	72	10	Washington	3.15	77	11
Quartile mean	2.89	87		Quartile mean	2.74	95	
3rd Quartile				**3rd Quartile**			
Ohio	3.43	130	42	Ohio	3.34	107	33
Michigan	3.45	113	34	Connecticut	3.39	100	29
Connecticut	3.56	96	26	Massachusetts	3.43	116	36
Massachusetts	3.97	121	38	Michigan	3.45	96	27
Alaska	4.38	115	37	Alaska	4.17	205	49
Wyoming	4.86	108	31	Idaho	4.62	90	23
Idaho	4.87	78	18	Minnesota	4.65	93	26
Oregon	4.93	100	27	Oregon	4.74	80	14
Illinois	4.97	156	46	Illinois	4.81	142	46
Minnesota	4.97	77	15	New Jersey	4.81	105	31
New Jersey	5.00	113	35	Wyoming	4.88	106	32
Wisconsin	5.24	62	4	Wisconsin	4.96	72	6
Quartile mean	4.47	106		Quartile mean	4.27	109	
4th Quartile				**4th Quartile**			
Missouri	6.41	190	49	Missouri	6.16	140	45
Kansas	6.96	111	32	Kansas	6.60	129	41
Arkansas	7.32	76	14	Arkansas	6.92	78	12
Iowa	7.88	66	6	Iowa	7.80	67	3
New Hampshire	9.17	136	43	New Hampshire	8.75	138	44
Oklahoma	9.35	94	25	Oklahoma	9.01	84	18
Maine	10.55	105	29	Maine	10.53	118	37
South Dakota	13.23	128	41	South Dakota	12.80	112	35
North Dakota	19.72	144	44	North Dakota	19.41	132	42
Nebraska	22.71	123	40	Nebraska	22.16	123	39
Vermont	25.19	183	47	Vermont	24.44	170	48
Montana	29.30	189	48	Montana	27.94	157	47
Quartile mean	13.98	129		Quartile mean	13.54	121	
Total mean	5.54	100		Total mean	5.34	100	

Note: Indices are constructed so that higher values indicate less equity.
Source: Common Core Data, National Center for Education Statistics.

tion, states with a higher number of districts made larger equity gains between 1992 and 1995 than states with fewer districts, though the states with more districts still tended to have greater disparities in both years. For example, the mean equity index for states with the largest number of districts (greater than 6.40 per 10,000 students) decreased from 129 in 1992 to 121 in 1995, while the measure increased slightly or remained unchanged for districts in the lower quartiles. There was also a reduction in the number of districts per 10,000 students for many states, which may be the result of targeted district consolidation. Two-tailed Pearson correlation results also show a strong relationship between the equity index and the number of districts in a state (Pearson correlation coefficient = .53).

Horizontal Equity by Median Revenues

Equality of resource distribution must be viewed in the context of other available information about each state's education system. Funding equality may not be desirable if it is achieved because all districts spend relatively little for education. To address this issue, we examined the equity index by quartile of median per-pupil revenue, adjusted for cost-of-education differences. In 1992, the national median of per-pupil state and local revenue was $5,429; by 1995, it had increased to $6,210.[11] In 1995, Mississippi had the lowest median revenue level of $4,056 per pupil, while New Jersey had the highest at $8,021. With some exceptions, such as Florida, southern states tended to have lower levels of per-pupil revenues, while northeastern states tended to have higher levels. No clear pattern emerges, though, in the relationship between median revenue levels and equity.

Horizontal Equity by State's Share of Revenue

A number of states have responded to equity concerns by increasing state revenues for education in combination with stable or decreasing local revenues (see Picus 1991 and Theobald and Hanna 1991 for examples from California and Washington state, respectively). A state government's ability to redistribute resources across districts seems to make this a reasonable approach. Therefore, it is important to examine whether, in practice, a higher state share of education funding is closely linked to greater equality.

Nationally, states' average contributions to public education remained relatively stable from 1992 to 1995 at approximately 47 percent. New Hampshire contributed the smallest percentage of revenues in both years, while New Mexico contributed the largest (see table 4). While the national average share of revenues remained stable, the data strongly suggest that as a state's share of revenues for education increases, horizontal equity improves. In 1995, the equity measures for the bottom quartile of state share (less than 40 percent state funding) showed considerably more inequality than those for the highest quartile (greater than 58 percent state funding), with an even larger spread between the lowest and third quartiles. The 1992 data show an even more dramatic difference between states at the lowest level of state assistance and those at the upper levels.

One example of how the relative share of state funding may affect horizontal equity is the state of Michigan, which has significantly altered its revenue sources for education since 1993. In 1992, the state contributed 26.6 percent of education revenues; by 1995, that share had increased dramatically to 67.3 percent. Michigan shifted from a

Table 3 Intrastate Equity Measures by Median Revenue per Pupil by Quartile, 1992 and 1995

1992				1995			
State	Median revenue per pupil	Mean index	Rank of mean index	State	Median revenue per pupil	Mean index	Rank of mean index
1st Quartile				**1st Quartile**			
Mississippi	3,090	73	11	Mississippi	4,056	75	10
Utah	3,145	66	7	Utah	4,086	82	15
Nevada	3,480	90	23	California	4,214	125	40
Alabama	3,530	85	21	Idaho	4,245	90	23
Idaho	3,618	78	18	Tennessee	4,445	74	8
Tennessee	3,628	112	33	Alabama	4,540	84	19
Missouri	3,739	190	49	Arkansas	4,547	78	12
New Mexico	3,787	72	9	Arizona	4,558	111	34
Oklahoma	3,787	94	25	Louisiana	4,680	85	20
Arkansas	3,853	76	14	Oklahoma	4,719	84	18
California	3,877	121	39	New Mexico	4,740	92	25
Kentucky	4,186	48	2	Montana	4,893	157	47
South Dakota	4,250	128	41	Missouri	4,994	140	45
Quartile mean	3,690	95		Quartile mean	4,517	98	
Quartile 2*				**Quartile 2***			
South Carolina	4,328	62	5	Alaska	5,050	205	49
Arizona	4,331	104	28	North Dakota	5,152	132	42
Illinois	4,353	156	46	South Carolina	5,153	79	13
Louisiana	4,410	74	13	North Carolina	5,262	75	9
Virginia	4,450	106	30	Texas	5,269	134	43
Texas	4,475	89	22	Georgia	5,359	90	21
Georgia	4,492	93	24	Ohio	5,369	107	33
North Dakota	4,531	144	44	Nevada	5,371	72	7
Montana	4,558	189	48	South Dakota	5,410	112	35
North Carolina	4,672	67	8	Colorado	5,471	97	28
Ohio	4,716	130	42	New Hampshire	5,532	138	44
Massachusetts	4,881	121	38	Virginia	5,603	92	24
Quartile mean	4,517	111		Quartile mean	5,333	111	
Quartile 3*				**Quartile 3***			
Oregon	5,057	100	27	Kentucky	5,653	67	4
Colorado	5,061	80	20	Washington	5,656	77	11
West Virginia	5,094	48	3	Oregon	5,703	80	14
Washington	5,105	72	10	Illinois	5,777	142	46
Maine	5,137	105	29	Kansas	5,972	129	41
Michigan	5,178	113	34	Wyoming	6,119	106	32
New Hampshire	5,182	136	43	Maine	6,153	118	37
Kansas	5,223	111	32	Florida	6,173	66	2
Indiana	5,329	74	12	Rhode Island	6,176	84	16
Iowa	5,363	66	6	Massachusetts	6,202	116	36
Delaware	5,410	114	36	Iowa	6,223	67	3
Alaska	5,450	115	37	Nebraska	6,228	123	39
Quartile mean	5,216	95		Quartile mean	6,003	98	
Quartile 4				**Quartile 4**			
Rhode Island	5,481	77	16	West Virginia	6,294	64	1
Nebraska	5,504	123	40	Maryland	6,450	90	22
Florida	5,518	47	1	Minnesota	6,463	93	26
Wyoming	5,608	108	31	Michigan	6,496	96	27
Minnesota	5,684	77	15	Pennsylvania	6,565	84	17
Maryland	5,689	77	17	Delaware	6,660	101	30
Pennsylvania	5,965	78	19	Indiana	6,705	70	5
Wisconsin	5,983	62	4	Wisconsin	6,772	72	6
New York	6,809	155	45	Connecticut	7,332	100	29
Connecticut	6,838	96	26	New York	7,614	123	38
Vermont	7,427	183	47	Vermont	7,777	170	48
New Jersey	7,931	113	35	New Jersey	8,021	105	31
Quartile mean	6,203	100		Quartile mean	6,929	97	
Total mean	5,429*	100		Total mean	6,210*	100	

*Calculated as median revenue per pupil in the United States.

Note: Indices are constructed so that higher values indicate less equity.

Source: Common Core Data, National Center for Education Statistics.

Table 4 Intrastate Equity Measures by Percentage of State Share Funding by Quartile, 1992 and 1995

State	1992 Percent of state funding	1992 Mean index	1992 Rank of mean index	State	1995 Percent of state funding	1995 Mean index	1995 Rank of mean index
Quartile 1				**Quartile 1**			
New Hampshire	8.50	136	43	New Hampshire	7.30	138	44
Michigan	26.60	113	34	South Dakota	26.50	112	35
South Dakota	27.00	128	41	Illinois	28.00	142	46
Illinois	28.90	156	46	Vermont	29.80	170	48
Oregon	30.60	100	27	Nevada	30.10	72	7
Massachusetts	30.70	121	38	Virginia	31.80	92	24
Virginia	31.10	106	30	Nebraska	32.40	123	39
Vermont	31.60	183	47	Massachusetts	36.30	116	36
Nebraska	34.30	123	40	Maryland	37.00	90	22
Missouri	38.00	190	49	New Jersey	38.00	105	31
Maryland	38.20	77	17	Missouri	38.70	140	45
Rhode Island	38.50	77	16	Connecticut	39.50	100	29
Nevada	38.70	90	23	Ohio	40.00	107	33
Quartile mean	30.98	123		Quartile mean	31.95	116	
Quartile 2*				**Quartile 2***			
Wisconsin	39.40	62	4	Pennsylvania	40.10	84	17
New York	40.30	155	45	Texas	40.20	134	43
Connecticut	40.70	96	26	Rhode Island	40.50	84	16
Ohio	40.80	130	42	New York	40.70	123	38
Pennsylvania	41.40	78	19	Wisconsin	41.10	72	6
Montana	41.80	189	48	North Dakota	42.10	132	42
New Jersey	42.20	113	35	Colorado	42.90	97	28
Tennessee	42.20	112	33	Arizona	44.00	111	34
Arizona	42.40	104	28	Oregon	46.20	80	14
Kansas	42.40	111	32	South Carolina	46.30	79	13
Colorado	42.80	80	20	Tennessee	47.50	74	8
Texas	43.40	89	22	Iowa	47.90	67	3
North Dakota	44.80	144	44	Maine	47.90	118	37
Quartile mean	41.89	113		Quartile mean	43.65	97	
Quartile 3*				**Quartile 3***			
Iowa	47.30	66	6	Wyoming	48.00	106	32
Georgia	47.70	93	24	Florida	49.10	66	2
Florida	48.30	47	1	Montana	49.60	157	47
South Carolina	48.30	62	5	Georgia	50.70	90	21
Maine	49.80	105	29	Louisiana	52.10	85	20
Wyoming	50.00	108	31	Minnesota	52.40	93	26
Minnesota	51.60	77	15	Indiana	53.30	70	5
Indiana	52.80	74	12	California	54.20	125	40
Mississippi	53.50	73	11	Utah	54.30	82	15
Louisiana	54.80	74	13	Mississippi	56.40	75	10
Utah	57.20	66	7	Kansas	57.40	129	41
Quartile mean	51.03	77		Quartile mean	52.50	98	
Quartile 4				**Quartile 4**			
Alabama	58.80	85	21	Arkansas	58.20	78	12
Arkansas	59.90	76	14	Oklahoma	59.40	84	18
Idaho	61.80	78	18	Alabama	61.00	84	19
Oklahoma	62.20	94	25	Idaho	61.20	90	23
North Carolina	63.60	67	8	West Virginia	63.60	64	1
California	65.90	121	39	Delaware	64.30	101	30
Delaware	65.90	114	36	North Carolina	65.10	75	9
Kentucky	67.00	48	2	Kentucky	65.80	67	4
West Virginia	67.10	48	3	Michigan	67.30	96	27
Alaska	68.00	115	37	Alaska	67.60	205	49
Washington	71.70	72	10	Washington	68.70	77	11
New Mexico	73.80	72	9	New Mexico	74.40	92	25
Quartile mean	65.48	83		Quartile mean	64.72	93	
Total mean	46.82	100		Total mean	47.69	100	

*Number of states in quartiles differs due to rounding.
Note: Indices are constructed so that higher values indicate less equity.
Source: Common Core Data, National Center for Education Statistics.

funding system that relied heavily on property taxes to a more complex system of tax reform that includes a two-cent sales tax increase, a 50-cent-per-pack tax increase on cigarettes, a reduction in the state income tax rate, and a standard statewide property tax millage rate (Courant and Loeb 1997). Comparing the horizontal-equity measures for Michigan in 1992 and 1995, revenue distribution appears to be more equitable following this effort, which reduced reliance on local wealth and distributed state funding for education more evenly.

Kansas also has undergone a major restructuring of its school funding formula. In 1992, the legislature adopted a new financing structure that reduced reliance on local property taxes and imposed a strict relative-equity standard on school district spending to limit local taxing and spending decisions (Johnston and Duncombe 1998).[12] While the state's share of funding increased from 42 percent to 57 percent during this period, our results suggest that equity declined slightly between 1992 and 1995.

Multivariate Results

To further examine the relationship between factors within the control of state policy makers and the level of funding equality within states, we use weighted least squares regression analysis. Specifically, we regress the mean equity index on median revenue per pupil, districts per 10,000 students, and the state's share of education funding for 1992 and 1995, weighting by each state's student enrollment. The results presented in table 5 indicate that, in both years, a higher number of districts in a state is related to lower equality of funding across districts, while a higher proportion of funding from state sources is related to greater equality of funding. The level of median revenue for education is

negatively related to the mean equity index in both years, though the results are statistically significant only in 1995. These results further support the conclusions suggested by the earlier tables: the number of school districts in a state and the share of revenues from state sources are related to the equality of education funding across districts.

Table 5 Regression Model of Horizontal Equity, 1992 and 1995

(Higher index values reflect lower equality across districts)

	Mean Equity Index	
	1992	1995
Constant	151.02	181.91
	(34.43)	(27.13)
Districts per 10,000 students	2.59*	1.86*
	(1.38)	(1.03)
Median revenues per pupil (thousands)	-3.57	-6.72**
	(4.59)	(3.25)
Percentage of state funding	-.86**	-1.00***
	(0.38)	(.309)
N	49	49
R-square	0.194	0.222

Standard error in parentheses.
***Significant at p<.01.
**Significant at p<.05.
*Significant at p<.10.
Regression weighted by state enrollment.

Conclusions

This article presents a longitudinal "status report" on intrastate school-finance equity in the United States. Using national data on school district revenues and on differences in the cost of education across localities, the study provides a method for combining numerous measures to more readily compare equity across states. Results of the analyses suggest the following:

- When comparing the national averages of the equity measures, overall intrastate funding equality improved slightly between 1992 and 1995.
- The relative rankings for most states changed little between 1992 and 1995.
- States with fewer school districts tended to have a more equal distribution of education dollars than states with more districts. States with a higher number of districts made larger equity gains than states with fewer districts, but the disparities still tended to be larger in states with more districts.
- States with higher proportions of revenues provided by state governments generally showed a more equal distribution of resources than states that were more dependent on local revenue sources.
- While these patterns suggest that increasing state responsibility for funding education or consolidating school districts might improve horizontal equity, they should not be taken as an easy prescription to remedy this systemic problem. As with most complex public policy issues, there are multiple causes of school-finance inequities, as well as institutional barriers to implementing reforms. However, the availability of national benchmarks can help policy makers to identify similar states with more equitable funding systems and to use them as models to develop reform alternatives for their own states. Additionally, case studies and analyses of individual states can help to determine the factors that may help such reforms to succeed or fail (see, for example, Johnston and Duncombe 1998; Odden, Busch, and Hertert 1996; Goertz 1992). In an area as complex and politically contentious as school-finance reform, data and analysis alone cannot resolve debates about the best way to provide equitable educational opportunities to all children. But the availability of national analyses and state-by-state information can provide an important resource as states move ahead on the path to reform.

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Notes

1. Hawaii has a single statewide school district, so there is no dispersion of funding across districts.
2. In this case, plaintiffs argued that property-wealth disparities across school districts created a "suspect class," thereby violating the state's equal protection clause by unfairly disadvantaging students in property-poor districts.
3. See Swanson and King (1998) for a thorough review of school-finance litigation.
4. In 1997, the state share of total K–12 education spending varied from 90 percent in Hawaii, which has no local school districts, to less than 10 percent in New Hampshire.
5. For example, in the *Serrano v. Priest* case, the superior court judge ordered California to reduce spending differences to less than $100 per pupil across districts, regardless of property wealth (Picus 1991).
6. Because differences in spending are likely to reflect, in part, differences in purchasing power across localities, we use a cost-of-education index created by Chambers (1998) to adjust the data. Chambers's Geographical Cost of Education Index estimates differences across school districts in the cost of purchasing the inputs—primarily teachers—used to provide educational services. See appendix A for more detail.
7. Because the study focuses on horizontal equity, we refer to both "equity" and "equality" in the text. No attempt is made to measure differences in funding related to student needs (such as learning and physical disabilities or limited proficiency in English) or to differences in wealth across districts. While it is essential to conduct analyses related to differential student needs and wealth, the courts and the public are often most concerned with the bottom-line issue of per-pupil spending differences across districts. See Parrish, Matsumoto, and Fowler (1995) and Parrish, Hikido, and Fowler (1998) for examples of equity analyses using pupil weights to account for student needs.
8. While the statistics for each state are weighted by the number of pupils in each district, the national average is constructed as the simple (unweighted) mean of each state's values (n=49). The mean index number is sensitive to the four index values it includes. For example, Texas's 1995 coefficient of variation was substantially above (worse than) the national average, while its other measures were at or close to the average. Excluding the coefficient of the variation from the mean-index calculation would considerably improve Texas's relative ranking.
9. As Oates (1972) notes, public goods will be provided by jurisdictions that cover the smallest geographic area over which benefits are distributed, so that efficiencies are maximized and the effects of taste differences are minimized.
10. We divide the number of districts by 10,000 students because larger states are likely to have more districts simply because they have more students.
11. While these data are adjusted for geographic cost differences, they are not adjusted for changes caused by inflation.
12. This plan created a local option budget that allows districts to exceed the state-imposed budget limit by up to 25 percent. Johnston and Duncombe (1998) find that horizontal equity improved after the funding changes, even after accounting for the inclusion of the local budget option.

References

Berne, Robert, and Leanna Stiefel. 1984. *The Measurement of Equity in School Finance*. Baltimore, MD: Johns Hopkins University Press.

Chambers, Jay G. 1998. *Geographic Variations in Public Schools' Costs*. U.S. Department of Education, Office of Educational Research and Improvement, Working Paper 98-04.

Coleman, James, et al. 1966. *Equality of Educational Opportunity*. Washington, DC: Government Printing Office.

Courant, Paul, and Susanna Loeb. 1997. Centralization of School Finance in Michigan. *Journal of Policy Analysis and Management* 16(4): 114–36.

Evans, William N., Sheila Murray, and Robert M. Schwab. 1997. Schoolhouses, Courthouses, and Statehouses after Serrano. *Journal of Policy Analysis and Management* 16(4): 10–31.

Goertz, Margaret E. 1992. School Finance Reform in New Jersey: The Saga Continues. *Journal of Education Finance* 18(4): 346–65.

Government Accounting Office (GAO). 1997. *State Efforts to Reduce Funding Gaps Between Poor and Wealthy Districts*. Washington, DC: Government Printing Office.

Hanushek, Eric A. 1972. *Education and Race: An Analysis of the Educational Production Process*. Cambridge, MA: Heath-Lexington.

———. 1981. Throwing Money at Schools. *Journal of Policy Analysis and Management* 1(1): 19–41.

———. 1989. The Impact of Differential Expenditures on School Performance. *Educational Researcher* 18(4): 45–51.

Hedges, Larry, Richard D. Laine, and Rob Greenwald. 1994. Does Money Matter? A Meta-analysis of Studies of the Effects of Differential School Inputs on Student Outcomes. *Educational Researcher* 23(3): 5–14.

Hertert, Linda, Carolyn Busch, and Allan R. Odden. 1994. School Financing Inequities among the States: The Problem for a National Perspective. *Journal of Education Finance* 19(3): 231–55.

Johnston, Jocelyn M., and William Duncombe. 1998. Balancing Conflicting Policy Objectives: The Case of School Finance Reform. *Public Administration Review* 58(2): 145–58.

Minorini, Paul A., and Stephen D. Sugarman. 1999. School Finance Litigation in the Name of Educational Equity: Its Evo-

lution, Impact, and Future. In *Equity and Adequacy in Education Finance: Issues and Perspectives*, edited by Helen F. Ladd, Rosemary Chalk, and Janet S. Hansen, 34–71. Washington, DC: National Academy Press.

Monk, David. 1990. *Education Finance: An Economic Approach*. New York: McGraw-Hill.

Murnane, Richard J. 1975. *The Impact of School Resources on the Learning of Inner City Children*. Cambridge, MA: Ballinger.

Oates, Wallace. 1972. *Fiscal Federalism*. New York: Harcourt Brace Jovanovich.

Odden, Allan R., and William H. Clune. 1998. School Finance Systems: Aging Structures in Need of Renovation. *Educational Evaluation and Policy Analysis* 20(3): 157–77.

Odden, Allan R., and Lawrence O. Picus. 1992. *School Finance: A Policy Perspective*. New York: McGraw Hill.

Odden, Allan R., Carolyn Busch, and Linda Hertert. 1996. The Intricacies of Reforming School Finance and Providing Property Tax Relief in Wisconsin. *Journal of Education Finance* 21(3): 321–42.

Parrish, Thomas B., Christine S. Hikido, and William J. Fowler. 1998. *Inequalities in Public School District Revenues*. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

Parrish, Thomas B., Christine S. Matsumoto, and William J. Fowler, Jr. 1995. *Disparities in Public School District Spending 1989–90, A Multivariate, Student-Weighted Analysis, Adjusted for Differences in Geographic Cost of Lining and Student Need*. Washington, DC: U.S. Department of Education.

Picus, Lawrence O. 1991. Cadillacs or Chevrolets? The Evolution of State Control over School Finance in California. *Journal of Education Finance* 17(1): 33–59.

Rubenstein, Ross, Dwight R. Doering, and Larry R. Gess. 2000. The Equity of Public Education Funding in Georgia, 1988–1996. *Journal of Education Finance* 26(2): 187–208.

Schwartz, M., and J. Moskowitz. 1988. *Fiscal Equity in the United States, 1984–88*. Washington, DC: Decision Resources Corp.

Swanson, Austin D., and Richard King. 1997. *School Finance: Its Economics and Politics*. 2nd ed. New York: Longman Publishers.

Theobald, Neil D., and Faith Hanna. 1991. Ample Provision for Whom? The Evolution of State Control over Finance in Washington. *Journal of Education Finance* 17(1): 7–32.

Wassmer, Robert W., and Ronald C. Fisher. 1996. An Evaluation of the Recent Move to Centralize the Finance of Public Schools in Michigan. *Public Budgeting and Finance* 16(3): 90–112.

Wyckoff, James H. 1992. The Intrastate Equality of Public Primary and Secondary Education Resources in the U.S., 1980–1987. *Economics of Education Review* 11(1): 19–30.

Appendix Methodology and Equity Measures

All revenue and enrollment data come from the Common Core of Data, produced by the National Center for Education Statistics, for the 1991–92 and 1994–95 school years. The analyses measure the dispersion of combined state and local revenues by district for all states, with the exception of Hawaii. Federal revenues, because they are outside the control of state and local policy makers, are excluded from the analyses. Districts with fewer than five students and those with over 50 percent of students in special education were removed from the data set.

To account for differences in exogenous costs facing each district, the data were adjusted using the cost-of-education index created by Chambers (1998). Chambers's Geographical Cost of Education Index uses a hedonic wage model to control for factors outside local districts' control that affect their costs, including amenities that make teaching and other staff positions relatively more or less attractive.

A data set was constructed for each state consisting of pupil enrollments and per-pupil revenues from state and local sources. Using the cost-adjusted revenue data, we calculated univariate dispersion measures for each state. The measures use a pupil unit of analysis; that is, all calculations were weighted by the number of pupils in each district. Thus, very small districts (which often have higher per-pupil costs due to diseconomies of scale, remote locations, or other factors) had less influence on the results than did large districts. The unit of analysis is especially important in states with a single district much larger than any other (for example, New York or Nevada). Average per-pupil revenues in such districts will have a strong influence on the measures for those states.

These analyses use four univariate dispersion measures to quantify differences in per-pupil revenues across districts (see Berne and Stiefel 1984, for a comprehensive list of equity measures). Each measure focuses on different parts of the distribution. The measures used in this analysis are:

- **Federal range ratio**—the difference between per-pupil revenues at the ninety-fifth and fifth percentiles, divided by the per-pupil revenues at the fifth percentile.
- **Coefficient of variation**—the standard deviation divided by the mean. A value of 0 represents perfect equity.
- **McLoone index**—the sum of per-pupil revenues for students at or below the median, divided by the sum of per-pupil revenues if all students below the median received the median amount. A value of 1 indicates perfect equity.
- **Gini coefficient**—calculated as the area between a Lorenz curve and a 45-degree line (representing prefect equality), divided by the area under the 45-degree line. The Gini coefficient measures the difference between the actual distribution of revenue and the distribution if all students received equal amounts of revenue, with a value of 0 representing perfect equity.