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ABSTRACT

Public school expenditure differentials are especially of interest as they relate to children in particular categories of historical concern, such as minority status, poverty, and other at-risk factors. This report addresses school finance policy through the analysis of school district revenue and expenditure data from the 1990 Survey of Local Government Finances--School Systems. The largest variations in average public education expenditures occur between regions. Fully adjusted expenditures per student are highest in the northeastern region and lowest in the West ($5,293 versus $3,632). Public education expenditures per student are higher in smaller districts, and greater expenditures per student are associated with higher community socioeconomic status. More money is actually spent in districts with the highest percentages of minority students ($4,514 versus $3,920). While student/teacher ratios vary substantially by district size and region, the distribution of public education resources is substantially closer to being equal than wealth measured by housing values, and somewhat less varied than wealth measured by household income. Thirty-two tables and 38 figures present survey data. Five appendixes contain 21 additional tables of supplemental information. (Contains 33 references.) (SLD)

NATIONAL CENTER FOR EDUCATION STATISTICS

Statistical Analysis Report

February 1995

U.S. Department of Education
Office of Educational Research and Improvement
NCES 95-300

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Statistical Analysis Report February 1995

Disparities in Public School District Spending 1989–90

A multivariate, student-weighted analysis, adjusted for differences in geographic cost of living and student need

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National Center for Education Statistics

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February 1995

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Foreword

This study represents the first that has combined an existing National Center for Education Statistics (NCES) database with the new 1990 Census demographic data mapped by NCES to school district boundaries. In this case, school district revenues and expenditures are compared by such school district characteristics as median income, median housing value, education attainment of householders, urbanicity, district size, and grade-level organization, and such student demographic variables as percentage in poverty, special education, limited English proficient, at-risk, and minority enrollment.

The study presents not only the actual revenues and expenditures, and those resources adjusted for geographic cost-of-living differences, but also resources adjusted for variations in school districts' student need. The rationale is that not only are geographic adjustments to expenditures and income necessary to achieve comparable purchasing power, but also that school districts with certain types of students, such as students with physical disabilities, students in poverty, or students who are limited English proficient, will encounter higher costs in educating those students. In part, this is because students with physical disabilities and students in poverty have federally sponsored supplemental instruction programs with additional teaching staff, and students who are limited English proficient require assistance in learning English and are instructed in their native language.

This research makes comparisons of the resources of school districts by their characteristics, measures the degree of variation in resources across districts, and makes comparisons of the spending on one characteristic, while holding all of the other characteristics constant. NCES believes that this is the first national study to carefully examine school district spending by community and student characteristics, adjusting for geographic cost differences, and

using multiple regression to control for the simultaneous influence of more than a single school district characteristic. The authors present the findings both with and without the adjustments and statistical techniques so the readers can choose to examine the results according to their analytical preferences.

The Research and Development (R & D) series of reports has been initiated:

1) To share studies and research that are developmental in nature. The results of such studies may be revised as the work continues and additional data become available.

2) To share the results of studies that are, to some extent, on the "cutting-edge" of methodological developments. Emerging analytical approaches and new computer software development often permit new, and sometimes controversial, analysis to be done. By participating in "frontier research," we hope to contribute to the resolution of issues and improved analysis.

3) To participate in discussions of emerging issues of interest to education researchers, statisticians, and the federal statistical community in general. Such reports may document workshops and symposiums sponsored by NCES that address methodological and analytic issues or may share and discuss issues regarding NCES practice, procedures, and standards.

The common theme in all three goals is that these reports present results or discussions that do not reach definitive conclusions at this point in time, either because the data are tentative, the methodology is new and developing, or the topic is one on which there are divergent views.

Therefore, the techniques and inferences made from the data are tentative and are subject to revision. To facilitate the process of closure on the issues, we invite comment, criticism, and alternatives to what we have done. Such responses should be directed to:

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Statistical Standards and Methodology
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The authors gratefully acknowledge the comments and suggestions of the reviewers: Lee Hoffman, Paul Planchon, and Marilyn McMillen of the Elementary and Secondary Education Statistics Division; Robert Burton of the Statistical Standards and Methodology Division; John Burkett and Thomas Smith of the Data Development Division; Stephanie Stullich of the Planning and Evaluation Services; Phil Kearney of the University of Michigan; David Monk of Cornell University; and Wayne Riddle of Congressional Research Service.

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Executive Summary

The Purpose of This Report

Finance issues are among the most fundamental to public education. Questions relating to "who pays," "how much," and "for whom" are central to the concepts of equity and adequacy, which have long been at the heart of public education fiscal policy. Equity issues focus on the fairness of the overall public education allocation system. Given our decentralized system of public education, it is not surprising that more public dollars are spent on the education of some school children as opposed to others. These differences may not be undesirable or unwarranted. Given the variations in the cost of education resources and in the needs of students that are known to exist across districts, equal dollars per student may not result in equal education opportunities. Thus, a major fiscal policy question is: Where do expenditure differences occur and to what degree? If expenditure differences are simply related to the differing capacities of states and localities to purchase public education services, at what point do these differences result in inequities for different types of students? These expenditure differentials are especially of interest as they relate to children in particular categories of historical concern, such as minority status, poverty, and other at-risk factors.

To the extent that these types of questions pertain to unequal allocations of public education resources to students with comparable education needs, they are considered to be horizontal equity issues. Vertical equity relates to expenditure differences justified by the differing education needs of students. For example, all public education funding formulas allocate different amounts of revenue to districts to account for the differing education needs of some types of students (e.g., special education). Vertical equity questions relate to which kinds of students should be eligible for additional aid and the appropriate size for these supplements. Both of these sets of equity issues closely relate to the adequacy of education revenues. Are they sufficient for their intended purpose? As the exact purposes of education are not fully agreed upon and the technology of education is not well understood, objective determinations of whether given

amounts of education resources are sufficient for their intended purpose generally cannot be made. For this reason, adequacy issues are most often expressed in terms that are relative to some specific standard, and all of these traditional fiscal policy issues revert to basic questions about who is receiving how much and for what purpose.

This report begins to answer these and other important school finance questions in ways that have not been previously reported. Measures of how much districts receive in public funds from local, state, and federal governments and how these resources are used to provide public education services are available for all of the school districts in the country, and these measures are matched to such important district characteristics as the percentage of children living in poverty, the percentage of minority children, and average wealth. Through the use of resource cost factors, alternative measures of district spending are expressed in terms of relative "buying power," and through the use of student-need adjustments, variations in the number of students with additional education requirements are also taken into account. Multivariate, as well as bivariate, analyses are used to isolate the impact of individual district and community factors on variations in expenditure. In addition to these adjusted forms, all of the resource measures included in this report are presented in their original (unadjusted) form for comparative purposes.

As an example, table A has been extracted from the main body of the report to illustrate the differing results that can be obtained through the use of bivariate and multivariate analyses. These data show that while the bivariate results indicate a positive relationship between student/teacher ratios and the percentage of minority enrollment, the multivariate data indicate the exact opposite relationship between these variables (columns 1 and 3). This difference results from the fact that while the bivariate results show the direct relationship between these two variables, the multivariate analyses also take simultaneously into account the effects of a number of variables believed to be relevant to variations in student/teacher ratios. Thus, while the bivariate analysis suggests a positive relationship between these two variables, the multivariate analysis indicates that this result is really an artifact of the relationship between the percentage of minority students and other related variables, such as the percentage of students in poverty and district urbanicity.

Using the multivariate analysis, in which the relationship between all of these related variables and student/teacher ratios are considered simultaneously, the relationship between percentage minority enrollments and student/teacher ratios becomes negative.

This example illustrates the importance of adding multivariate analyses to gain a fuller understanding of the relationships among the variables presented in this report. The general trends documented in this report primarily focus on the resource-cost and student-need-adjusted multivariate (fully adjusted) results. Although multivariate results are emphasized, the report notes when these general trends differ substantially from the actual bivariate results.

Table A.-- Student/teacher ratios by percentage of minority enrollment

District Characteristic	Percentage of Enrollment	Bivariate Results		Multivariate Results	
		Actual (1)	Student-Need-Adjusted (2)	Unadjusted Estimates (3)	Student-Need-Adjusted Estimates (4)
Minority Enrollment					
Less than 5%	21.9	17.0	19.1	18.7	21.5
5% - <20%	26.5	17.8	20.2	18.0	20.7
20% - <50%	25.7	18.2	21.0	17.7	20.4
50% or more	25.9	18.7	22.2	17.5	20.3

SOURCE: U.S. Department of Education. National Center for Education Statistics. 1989-90 Common Core of Data. 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Data Sources and Procedures

This report addresses school finance policy issues through the analysis of school district revenue and expenditure data from the 1990 Survey of Local Government Finances—School Systems (F-33) collected by the U.S. Bureau of the Census, as the collection request for the National Center for Education Statistics (NCES). To increase the policy relevance of these analyses, these fiscal data were matched to other NCES databases that provide more descriptive information about the districts and the communities in which they are located.

Three types of procedures were used to analyze these data:

- Comparisons of the actual and resource-cost and student-need-adjusted amounts of education resources received by different types of school districts and communities (bivariate analysis).

- Comparisons of the actual and resource-cost and student-need-adjusted amounts of education resources received by different types of school districts and communities, holding other factors constant (multivariate analysis).

- Measures of the degree of variation in resource quantities across districts (dispersion analysis).

Policy Questions

Four important policy questions that relate to the financing of public education are addressed in this report.

- How do education resource measures, such as total expenditures per student, vary in different types of school districts and communities across the nation?

- How do school districts serving different types of students and communities allocate resources across the categories of instruction, administration, and capital outlay?

- How do local, state, and federal revenues vary for school districts serving different types of students and communities?

- To what extent do education resource measures vary across the nation?

The first question is addressed by examining alternative measures of school district spending and the relationships of these measures to such district and community characteristics as the percentage of students in poverty, the percentage of minority students, and average property wealth in the district. Addressing the second question involves breaking out aggregate expenditure measures into the more detailed categories of instruction, administration, and capital outlay. To address the third question, revenues are examined to assess varying reliance on local, state, and federal sources to support education services in different types of districts. The final question represents a departure from the basic approach used for questions one through three. The section of this report that addresses this question considers all of the school districts across the nation to assess total disparity in resource measures such as total expenditures.

Summary of Findings

How do education resource measures, such as total expenditures per student, vary in different types of school districts and communities across the nation?

- Of all the variables included in this report, the largest variations in average public education expenditures occur between regions. Fully adjusted expenditures per student are substantially higher in the northeastern region of the country and are lowest in the West ($5,293 versus $3,632).

- Public education expenditures per student are higher in the nation's smallest districts whereas students receive an average fully adjusted expenditure of $4,862 versus $4,216 in the largest districts (10,000 students and above).

- Greater education expenditures per student are associated with higher community socioeconomic status as measured by the value of owner-occupied housing ($4,401 versus $3,992, fully adjusted), or by education attainment ($4,515 versus $3,953,

fully adjusted). However, this relationship is less pronounced when socioeconomic status is defined in terms of median household income. When the relationship between this variable and education expenditures is considered in isolation, only the wealthiest group is considerably different from the other groups.

- More money is spent in districts with the highest percentages of minority students compared to districts with the lowest percentages of minority students ($4,514 versus $3,920). Although minority students in poverty are often viewed as those least served by current systems of public education funding, these findings suggest that while inequalities may remain for students in poverty, they do not appear to be driven by minority status.

- Public education expenditures per student are highest in low poverty districts. The fully adjusted differential between the highest and lowest poverty districts is $309 per student ($4,219 versus $4,528). However, this relationship is not linear and affects only the 11 percent of students in the wealthiest districts. Among the other 89 percent of students, the variation is only $8 per student.[1]

- Districts with the highest percentages of students in special education show higher overall actual expenditures than do districts with the lowest percentages of special education students ($5,447 versus $5,061). However, when differences in the cost

[1] These findings differ from earlier analyses of the relationship between education expenditures and poverty conducted by Schwartz and Moskowitz (1988). Their state-by-state analyses reported three states with negative correlations, 14 states near zero, and 33 states with a positive relationship between these two variables. To further test our findings, which are based on more current data and evaluate this relationship on a national basis, we ran analyses dividing the districts into exact poverty quartiles. We also ran a straight correlation between the various measures of education spending used in this report and the percentage of school-age children in poverty. In each case we found a negative relationship between spending and poverty. Further analyses would be required to determine whether these contradictory findings represent a change over time (the Schwartz and Moskowitz poverty data are from 1979, while the data used in this report are from the 1990 census) or represent differences in the unit of analysis or in the methodological approach.

of living and the added cost of serving students with supplemental needs are included, an opposite expenditure pattern is observed ($4,219 versus $4,510).

How do school districts serving different types of students and communities allocate resources across the categories of instruction, administration, and capital outlay?

- Student/teacher ratios vary substantially by district size and region of the country. In both actual and adjusted terms, the average ratio is over 20 percent larger in the nation's largest districts (10,000 students or more) as opposed to the smallest (less than 1,000 students).[2] In actual terms, the average student/teacher ratio in the smallest districts is 15.1 as compared to 18.8 in the largest districts. These differences are even more pronounced by geographic region of the country, with the Northeast showing an average student/teacher ratio of 15.6 as compared to 21.9 for the West. The Midwest and South show average student/teacher ratios falling between these two values, at 17.3 and 17.1, respectively.

[Note: The following expenditure results were obtained only through bivariate analysis and do not control for other district characteristics. As such, they should be interpreted with greater caution than the results obtained through multivariate analysis.]

- Districts serving relatively high percentages of students in poverty, minority students, or limited English proficient (LEP) students allocate greater percentages of their funds to core instructional purposes than do districts serving lower percentages of students in these same groups.

- Capital outlay is the area of expenditure found to be the most sensitive to variations in total district spending compared to the categories of instruction and

[2] Student/teacher ratios are only adjusted for student-need variations. Because this resource is expressed in actual rather than dollar terms, resource-cost adjustments are inappropriate for this measure.

administration.[3] Districts with less to spend tend to focus on direct instruction and administration at the expense of capital expenditures.

- By region, districts in the northeastern section of the country spend more in the area of administration and support than the other regions (the Midwest, the South, and the West), and districts in the West spend appreciably less ($1,371 versus $831 per student).

How do local, state, and federal revenues vary for school districts serving different types of students and communities?

- The amount of local support for public education rises with the wealth and socioeconomic condition of the community.

- State funds are the primary equalizing force in public education resource allocations.

- Although state and federal allocations are larger in districts with large numbers of special, compensatory, and LEP students, based on the student-need adjustments used in this study, these additional funds appear to be insufficient to offset the supplemental cost of these programs.

[3] For the purposes of this study, capital outlay includes land purchases, building repair and construction, and expenditures on equipment. In subsequent analyses these categories of capital expenditure might be analyzed in more detail. It should also be noted that these analyses report actual expenditures. While annualized costs are generally considered more appropriate in analyses of capital items, these cost data were not available.

To what extent do education resource measures vary across the nation?

- The distribution of public education resources is substantially more nearly equal than wealth measured by housing values, and somewhat less varied than wealth measured by household income.

- State public education allocation systems are the primary equalizing factors of education resources, with some additional equalization resulting from the various federal funding programs.

Implications for Further Research

The results obtained through multiple regression demonstrate that school district spending substantially varies by geographic region, as does student/teacher ratio. This substantial difference in education funding by region may be a matter of concern—the implications of which need to be thoroughly explored by the school finance research community.

Two findings of this study run somewhat counter to initial expectations. First, spending by school district size is higher only for those school districts with under 1,000 enrollment, other factors being equal. This seems to suggest that the expected diseconomies of small scale only hold for the nation's smallest school districts, a finding that may elicit further study.

A second, somewhat surprising, finding is that more money is spent in districts with the highest percentages of minority students ($4,514 versus $3,920), holding other school district and community characteristics constant. This finding should be further explored by school finance researchers.

A less surprising finding is that greater total expenditures per student are associated with higher community socioeconomic status, measured by the value of owner-occupied housing (per

student expenditures of $4,401 versus $3,992, other factors held constant), or by education attainment ($4,515 versus $3,953). Differences in student/teacher ratios also appear but are less than 1.5 students per teacher.

When socioeconomic status is measured by cost-adjusted median household income, however, and all other factors are held constant, th xpenditures per student between the highest and lowest income groups differ by only $186 ($4,382 versus $4,196). These findings relating alternative measures of socioeconomic status to education spending provide a fertile field for further research.

Public education total expenditures per student are highest in low poverty districts, but unlike socioeconomic status, the relationship is not linear. Controlling for other factors, the differential between the highest and lowest poverty districts is $309 per student ($4,219 versus $4,528). Controlling for other school district characteristics, only school districts in the category with the fewest children in poverty spend substantially more per student.

It is also worthy of note that smaller dollar differences in per student expenditures are observed when core instructional, as opposed to total, expenditures are examined by socioeconomic status. Core instructional expenditures reflect the central purpose of the local education agency, which is to educate children. These findings suggest that lower wealth districts appear to be investing a larger percentage of their spending on core instruction, rather than on other areas. Although such findings mitigate total expenditure differences by socioeconomic status, they may also indicate that poor school districts are deferring needed school construction, renovation, and the purchase of instructional equipment. The current study is unable to completely explore the differences in spending for capital outlay, which includes both school construction and purchases of equipment. This also provides yet another opportunity for further research.

Introduction

The Purpose of This Report

Finance issues are among the most fundamental to public education. Questions relating to "who pays," "how much," and "for whom" are central to the concepts of equity and adequacy, which have long been at the heart of public education fiscal policy. Equity issues focus on the fairness of the overall public education allocation system. Given our decentralized system of public education, it is not surprising that more public dollars are spent on the education of some school children as opposed to others. These differences may not be undesirable or unwarranted. Given the variations in the cost of education resources and in the needs of students that are known to exist across districts, equal dollars per student may not result in equal education opportunities. Thus, a major fiscal policy question is: Where do expenditure differences occur and to what degree? If expenditure differences are simply related to the differing capacities of states and localities to purchase public education services, at what point do these differences result in inequities for different types of students? These expenditure differentials are especially of interest as they relate to children in particular categories of historical concern, such as minority status, poverty, and other at-risk factors.

To the extent that these types of questions pertain to unequal allocations of public education resources to students with comparable education needs, they are considered to be horizontal equity issues. Vertical equity relates to expenditure differences justified by the differing education needs of students. For example, all public education funding formulas allocate different amounts of revenue to districts to account for the differing education needs of some types of students (e.g., special education). Vertical equity questions relate to which kinds of students should be eligible for additional aid and the appropriate size for these supplements. Both of these sets of equity issues closely relate to the adequacy of education revenues. Are they sufficient for their intended purpose? As the exact purposes of education are not fully agreed upon and the technology of education is not well understood, objective determinations of whether given

amounts of education resources are sufficient for their intended purpose generally cannot be made. For this reason, adequacy issues are most often expressed in terms that are relative to some specific standard, and all of these traditional fiscal policy issues revert to basic questions about who is receiving how much and for what purpose.

This report begins to answer these and other important school finance questions in ways that have not been previously reported. Measures of how much districts receive in public funds and how these resources are used to provide public education services are available for all of the school districts in the country, and these measures are matched to such important district characteristics as the percentage of children in poverty, the percentage of minority children, and average wealth. Through the use of cost adjustments, alternative measures of district spending are expressed in terms of relative "buying power," and through the use of student weights, variations in student need are also taken into account. Multivariate, as well as bivariate, analyses are used to isolate the impact of individual district and community factors on variation in expenditure. In addition to these adjusted forms, all of the resource measures included in this report are presented in their original (unadjusted) form for comparative purposes

This report addresses four questions that are fundamental to public education fiscal policy:

- How do education resource measures, such as total expenditures per student, vary in different types of school districts and communities across the nation?

- How do school districts serving different types of students and communities allocate resources across the categories of instruction, administration, and capital outlay?

- How do local, state, and federal revenues vary for school districts serving different types of students and communities?

- To what extent do education resource measures vary across the nation?

The first question examines alternative measures of school district spending and the relationships of these measures to such district and community characteristics as the percentage of students in poverty, the percentage of minority students, and average property wealth in the district. The second question examines the breakout of aggregate expenditure measures into the more detailed categories of instruction, administration, and capital outlay. To address the third question, revenues are examined to assess varying reliance on local, state, and federal sources to support education services in different types of districts. The final question assesses total disparity in resource measures such as total expenditures across the nation.

Interest in these fundamental questions about the financing of public education is as old as public education itself. Over time, and for a number of reasons, questions related to support for public education have become among the most important we face as a nation. The growing competitiveness associated with global markets has made it increasingly clear that an educated and skilled populace is perhaps our most valuable national resource. Increasingly, education attainment is being seen as synonymous with national well-being. This renewed sense of urgency regarding the importance of the public education investment is sounded in the landmark reform document, *A Nation At Risk, the Imperative for Educational Reform* (National Commission on Excellence in Education 1983). Referring to the importance of public education, it begins:

> Our nation is at risk. Our once unchallenged preeminence in commerce, industry, science, and technological innovation is being overtaken by competitors throughout the world. This report is concerned with only one of the many causes and dimensions of the problem, but it is the one that undergirds American prosperity, security, and civility.

This concern with public education is carried to the present through the formation of such national education policy as *Goals 2000: Educate America*. Described by the U.S. Secretary of Education Riley as "the most comprehensive and important new federal legislation affecting K-12 education in years," this law specifies a set of goals and procedures for "reinventing American education" by the year 2000 (U.S. Department of Education 1994).

Concepts related to public education are also viewed as fundamental to our national identity. Access to public education has long been considered central to equality of opportunity. Public education is generally considered to be the primary vehicle for providing equality of access to the opportunities in life.

The high level of interest in the financing and provision of public education services has generated substantial research and policy activity. For example, a number of efforts have been made to assess the degree of equity in school finance (Berne and Stiefel 1984; Schwartz, Myron, and Moskowitz 1988; Carroll 1983). The courts have also played a major role relative to school finance equalization (Clune 1992) with legal challenges to the equity of school financing in half of the states in the nation (Hickrod 1994). Qualitative analyses, such as Jonathan Kozol's *Savage Inequalities* (1991), sometimes portray a stark picture of what inadequate levels of education resources can mean on an individual basis, especially for minority students living in extreme poverty.

Data Sources and Procedures

This report addresses school finance policy issues through the analysis of school district revenue and expenditure data from the 1990 Survey of Local Government Finances—School Systems (F-33) collected by the U.S. Bureau of Census, as the collection request for the National Center for Education Statistics (NCES). All of the public school districts in the nation are

represented in this data collection, although only "regular" school districts were included in the analysis (excluding special education districts, for example). To increase the policy relevance of these analyses, these fiscal data were matched to other databases that provide more descriptive information about districts and the communities in which they are located. These other data sources are the nonfiscal data from the Common Core of Data (CCD) from the 1989-1990 school year and the 1990 data collected by the U.S. Bureau of the Census mapped by school district. The resulting dataset enables the examination of public education expenditure patterns in public school districts across the nation, as well as the comparison of these allocations across a full set of district and community characteristics. Data sources, procedures, and limitations are described in more detail in Appendix D.

Resource measures. Fiscal and actual resource measures are presented in this report. The fiscal resource measures include total revenues, total expenditures, current operating expenditures, and core instructional expenditures. The first measure includes the total amount of district revenues from local, state, and federal sources. The first two expenditure measures, total and current operating expenditures, differ by the inclusion of capital outlay (school construction and renovation and the purchase of equipment) and debt service. Core instructional expenditures are limited to all district expenditures associated with actual instructional services. For example, school and general administrative expenditures are excluded from this last expenditure measure.

The last resource measure used in this report is the average number of students per teacher. This measure of actual education resources is derived by dividing the total number of students in the district by the total number of teachers, and includes individuals who teach in an environment other than a regular classroom setting (e.g., a special education teacher in a resource room).

District and community variables. The district variables included in this report are the enrollment of the districts and the district's level of instruction (elementary, secondary, or unified).

Districts are also described by the types of students they enroll; these student characteristics include the percentages of children who live in poverty, who are special education, who have limited proficiency in English, who are minority, and who are at-risk.[1]

Community measures include type of location (i.e., urban, suburban, or rural) and region of the country. Community wealth is measured by household income and the value of owner-occupied housing within the district's boundaries.[2] Characteristics of community residents include the percentage of householders with high school diplomas and the percentage of persons living in poverty. More detailed descriptions of the variables, and other terms used in this report, are included in Appendix E. The procedures used in deriving the breakpoints for these variables are described in Appendix D.

Resource adjustments. The resource measures listed above are presented in several alternative forms:

Actual quantities reflect the resource amounts actually reported for individual districts by the state education agency.

Resource-cost-adjusted amounts reflect dollar amounts adjusted for cost variations in different localities. Along with most other commodities, dollars spent for education services have varying levels of buying power in different areas of states and across the nation. Education resources are expressed in resource-cost-adjusted terms to reflect variations in real education resources, as opposed to nominal dollars. The resource-cost adjustments used in this report are

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[1] "At-risk children" is a variable created by the U.S. Bureau of Census. The Census definition is "living with a single mother who is not a high school graduate and is below the poverty line."

[2] In the full set of analyses, as presented in Appendix A, median household income was included in nominal and cost-adjusted forms to reflect the differing purchasing power of a given level of family income in different locations. Only the cost-adjusted results are shown in the main body of the report because of the minimal difference between these two sets of results. The variable median value of owner-occupied housing was only presented in its nominal form because these values already reflect the types of regional market conditions the resource costs are designed to represent.

based on cost-of-living adjustments designed to distinguish between metropolitan and rural areas within each state (McMahon and Chang 1991). The strengths and limitations of these indices, as well as alternative measures that might be used for these purposes, are described in Appendix D.

Student-need-adjusted quantities are derived from a set of adjustments that account for differing compositions of student need within school districts. For example, equal education resources for a class of 25 special education and a class of 25 regular education students may produce very unequal levels of service in relation to the needs of the students enrolled. The student-need adjustments used for this study reflect the varying resource needs of three commonly recognized categories of special needs students. The following types of students were counted, or weighted, to equal more than one student:

- Special education students were given a weight of 2.3.
- Compensatory education students were given a weight of 1.2.
- Limited English proficient (LEP) students were given a weight of 1.2.

To apply this type of adjustment, the counts of special needs students in each district are multiplied by their weights to derive a total weighted count of students. For example, 100 special education students are counted as 230 regular education students. The weight of 2.3 reflects findings from several national studies of special education costs that show services for special education students to be 2.3 times as costly as for their regular education counterparts (Moore, Strang, Schwartz, and Braddock 1988; Chaikind, Danielson, and Brauen 1993). Unfortunately, there are no nationally representative cost data for compensatory education (Chapter 1) students or for LEP students. As stated by Levin (1989), "there is no single cost estimate that can be used as a basis for funding a major education program for at-risk students." He goes on to suggest an estimated weight of 1.5, with an alternative possible weight of 1.2. This latter weight is based on the average Chapter 1

allocation per student in relation to the average total expenditure per student in 1987. For the purposes of this study, the more conservative estimate of 1.2 is used for both compensatory education and LEP students.[3]

Because the application of these student weights will always have the effect of increasing the student count in districts with special needs students, student-need-adjusted enrollment will always be as large as, or larger than, the actual count of students. Conversely, resource quantities per student will be less when expressed in student-need-adjusted terms. The full derivation and use of these student weights, and their limitations, are described in Appendix D.

Resource-cost and student-need-adjusted quantities combine both of these types of adjustments. They reflect the relative purchasing power of education dollars when both resource-cost and student-need differentials are taken into account. This weighting has the effect of producing analytic results that apply to the typical student in a typical district of a certain type. For example, average expenditures per student can be compared across districts in different size categories, holding constant the varying needs of students in those districts or differences in resource costs. This allows the impact of district size to be separated from those other factors.

Three types of procedures were used to analyze these data:

- Comparisons of the actual and resource-cost and student-need-adjusted amounts of education resources received by different types of school districts and communities (bivariate analysis).

[3] The counts of compensatory education and limited English proficient (LEP) students by district used in this study were also based on estimates. The count of compensatory students was based on the percentage of school-age children in the district living in poverty. The LEP count was based on the percentage of school-age children residing in the district who live in homes in which the language spoken is not English, and who speak English "not well" or "not at all." Both of these data items were derived from the 1990 Census Mapping data.

- Comparisons of the actual and resource-cost and student-need-adjusted amounts of education resources received by different types of school districts and communities, holding other factors constant (multivariate analysis). The 12 factors are district enrollment, district type, percentage of children in poverty, percentage of special education students, percentage of LEP children, percentage of minority enrollment, percentage of at-risk children, metropolitan status, geographic region, median household income (cost-adjusted), median value owner-occupied housing, and education attainment of householders. In comparing districts on any one factor, the values represent districts with average values on all of the other factors. (See Appendix D for full description of regression model.)

- Measures of the degree of variation in resource quantities across districts (dispersion analysis).

The first approach is presented in the form of cross-tabulations of average values. For example, it is used to show simple relationships between actual and fully adjusted expenditures per student and the percentage of minority students. The second analytical approach reveals the impact of each individual district and community factor on alternative resource allocation measures in districts that are similar on other factors. This type of multivariate analysis sheds light on how simple two-way relationships between variables (e.g., the percentage of minority students and expenditures per student) can be better explained by taking other factors into account (e.g., the percentage of students in poverty). The final set of procedures measures the degree of variation in quantities of education resources per student. For example, this approach provides alternative measures of the difference between high and low spending districts.

The importance of the multivariate analyses to a more complete understanding of the true relationships among the variables presented in this report is illustrated in table 14 on page 38. This shows the differing results that can be obtained through the use of bivariate and multivariate analyses. These data show that although the bivariate results indicate a positive relationship

between student/teacher ratios and the percentage of minority enrollment, the multivariate data indicate the exact opposite relationship between these variables. This difference results from the fact that although the bivariate results show the direct relationship between these two variables, the multivariate analyses also take simultaneously into account the effects of a number of variables believed to be relevant to variations in student/teacher ratios. Thus, while the bivariate analysis suggests a positive relationship between these two variables, the multivariate analysis indicates that this result is really an artifact of the relationship between the percentage of minority students and other related variables, such as the percentage of students in poverty and district urban-city. The multivariate analysis shows that when the relationship between all of these related variables and student/teacher ratios are considered simultaneously, the relationship between percentage minority enrollments and student/teacher ratios becomes negative.

The full set of tables showing results from all three of these analytical approaches is found in Appendix A. All of the detailed results presented throughout the body of this report are drawn from Appendix A. All results are weighted by student enrollment, which causes a district of 2,000 students to make twice the contribution to a national average than a district of 1,000 students (i.e., each *student* is weighted equally). Standard deviations for tables A1.1 - A7.2 of Appendix A are shown in Appendix B. These tables are included to provide a standard measure of variation for the alternative expenditure results. Appendix C contains the number of districts in each of the district and community characteristic categories.

Findings

Findings are presented in four sections, based on the major policy questions listed in the introduction. Tables containing the full set of results from the analyses underlying this report are presented in Appendix A. The discussion that follows draws on excerpts from these full tables, presented in tabular and graphic form.

How Do Education Resource Measures, Such as Total Expenditures Per Student, Vary in Different Types of School Districts and Communities Across the Nation?

Summary of findings. How do education expenditures vary with alternative district and community measures? Students in districts enrolling the *lowest* percentages of students in poverty and the *lowest* percentages of students in need of special education services received the *highest* expenditures. While these trends are matters of concern from a student equity perspective, they should be considered in the context of no clear patterns of expenditure differentials for limited English proficient and at-risk students, and a positive relationship between percentage of minority students and expenditures. A summary of the most important individual findings from this section is provided below.

- *Of all the variables included in this report, the largest variations in average public education expenditures occur between regions.* Fully adjusted expenditures per student are substantially higher in the northeastern region of the country and are lowest in the West ($5,293 versus $3,632).

- *Public education expenditures per student are highest in the nation's smallest districts whereas students receive an average fully adjusted expenditure of $4,862 versus $4,216 in the largest districts (10,000 students and above).*

- *Greater education expenditures per student are associated with higher community socioeconomic status as measured by the value of owner-occupied housing ($4,401 versus $3,992, fully adjusted) or by education attainment ($4,515 versus $3,953, fully adjusted).* However, this relationship is less pronounced when socioeconomic status is defined in terms of median household income. When the relationship between this variable and education expenditures is considered in isolation, only the wealthiest group is considerably different from the other groups.

- *More money is spent in districts with the highest percentages of minority students compared to districts with the lowest percentages of minority students ($4,514 versus $3,920).* Although minority students in poverty are often viewed as those least served by current systems of public education funding, these findings suggest that while inequalities may remain for students in poverty, they do not appear to be driven by minority status.

- *Public education expenditures per student are highest in low poverty districts.* The fully adjusted differential between the highest and lowest poverty districts is $309 per student ($4,219 versus $4,528). However, this relationship is not linear and affects only the 11 percent of students in the wealthiest districts. Among the other 89 percent of students, the variation is only $8 per student.

- *Districts with the highest percentages of students in special education show higher overall actual expenditures than do districts with the lowest percentages of special education students ($5,447 versus $5,061).* However, when differences in the cost of living and the added cost of serving students with supplemental needs are included, an opposite expenditure pattern is observed ($4,219 versus $4,510).

Detailed findings by district characteristics.

Minority enrollment. The average expenditure data presented in this section of the report will be presented in four columns, as shown in table 1. The first two expenditure columns show the bivariate results, and the last two columns present the expenditure estimates from the multivariate analysis. In both of these two pairs of columns, actual (unadjusted) expenditures are compared to the fully adjusted results. While the bivariate analysis is only based on the two variables listed in the table (e.g., total expenditures and percentage of minority enrollment), the multivariate analysis shows average expenditures by percentage minority with the effects of all the other variables included in this analysis also taken into account. The other variables included in the multivariate analysis are presented in the individual tables 1 through 12, and are summarized in table A9 in Appendix A.

In assessing the relationship between two listed variables (e.g., percentage of minority enrollment and expenditures), it is important to examine all four of the alternative sets of results shown in each table. Any single set of numbers presented in isolation from the others may present a very different set of interpretations than viewing the full set of adjusted and unadjusted findings. The first district variable, percentage of minority students, will be used as the basis for describing and presenting a rationale for using these four columns of expenditure results. This variable is especially appropriate for this purpose because shifting expenditure patterns are observed across the four columns.

Column 1, the actual bivariate results, shows the average actual expenditure per student for each of the four percentage of minority student groupings. Considerably larger average actual expenditures per student are shown in districts with the highest percentages of minority students (50 percent or more). In column 2, these actual expenditures are adjusted to reflect variations in resource costs and student needs using the cost adjustment factors described above. The potential impact of these types of adjustments is well illustrated in the case of this variable, because the expenditure trend observed in column 1 is reversed in column 2. That is, when expenditures are

converted to "buying power" through the application of resource-cost and student-need adjustments, the districts enrolling the highest percentages of minority students are shown to have the *least*, rather than the *most*, purchasing power. This reversal is due to the fact that districts with high percentages of minority students tend to be in urban, higher cost areas that tend to have greater percentages of students with greater needs (i.e., in poverty or with limited English proficiency).

In columns 3 and 4, unadjusted versus cost- and need-adjusted expenditures are again presented as in columns 1 and 2. The difference is that in these latter two cases, the relationship between percentage minority enrollment and average expenditures is estimated within the context of a number of other variables that have been shown to also relate to variations in district expenditures. The expenditure data in columns 3 and 4 show the estimated impact of the percentage of minority students in the district on actual and cost- and need-adjusted expenditure estimates when the impact of a number of other variables that might influence these are also taken into account. When we remove, or "hold constant," the impact of variables such as percentage of students in poverty, a positive relationship between expenditures and percentage minority is shown in both the unadjusted (column 3) and the adjusted (column 4) estimates.

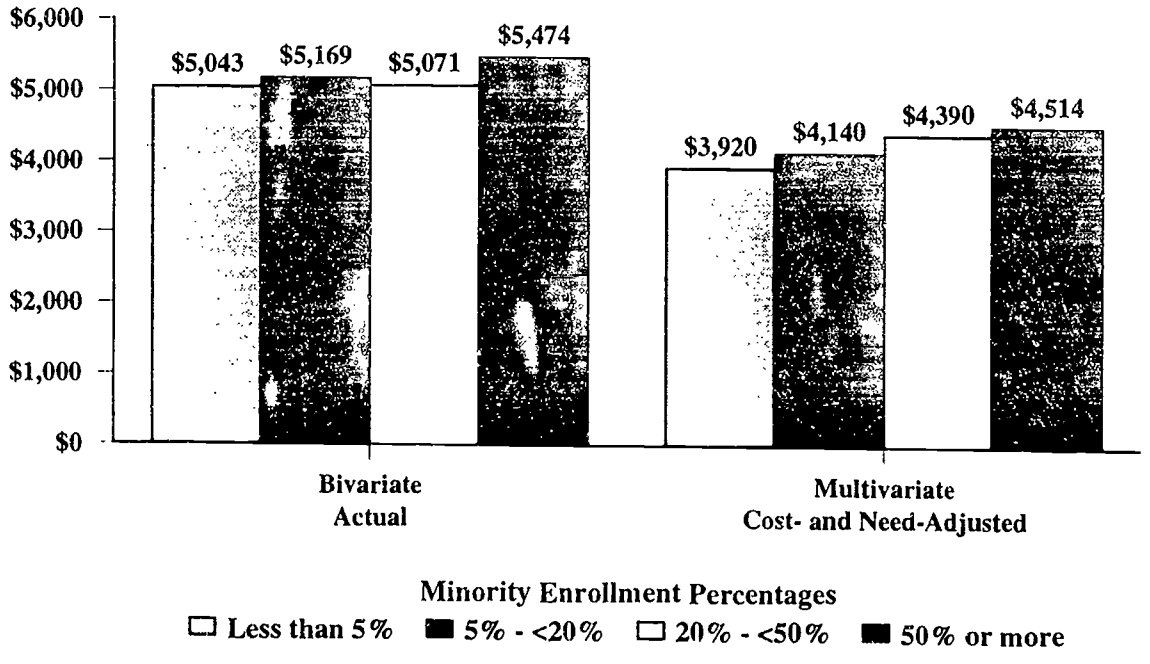
These findings illustrate the importance of presenting all four sets of results in conjunction with each of the variables to be presented in this section of the report. However, because the fully adjusted estimates presented in column 4 are considered to have the most utility for comparative purposes, these findings will be given the most emphasis in the narrative. Accordingly, references to "fully adjusted" as opposed to "actual" expenditures compare the estimates from column 4 to the actual expenditure data presented in column 1. This comparison is also shown in graphic form (figure 1).

Table 1.-- Total expenditures per student by percentage of minority enrollment

District Characteristic	Percentage of Enrollment	Bivariate Results		Multivariate Results	
		Actual (1)	Cost- and Need-Adjusted (2)	Unadjusted Estimates (3)	Cost- and Need-Adjusted Estimates (4)
Minority Enrollment					
Less than 5%	21.9	$5,043	$4,389	$4,581	$3,920
5% - <20%	26.4	5,169	4,350	4,954	4,140
20% - <50%	25.6	5,071	4,190	5,418	4,390
50% or more	26.1	5,474	4,103	5,740	4,514

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Figure 1.-- Actual and adjusted total expenditures per student by percentage of minority enrollment



SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data
NOTE: All results are weighted by district enrollment.

The multivariate analysis (columns 3 and 4) shows a clear, positive relationship between the percentage of minority students and expenditures in a district, when factors are equal. This indicates that among districts that are similar among such factors as percentage poverty and urbanicity, more is spent per student in high minority districts than in low minority districts ($4,514 versus $3,920).

Minority children in poverty are often viewed as those least served through current public education allocation systems. These findings suggest that although general inequalities may remain for students in poverty, they do not seem to be driven by minority status.

School-age children in poverty. As shown in table 2 and figure 2, actual public education expenditures are higher for children in low poverty districts (less than 5 percent poverty) than in other districts. However, among districts with more than 5 percent poverty, average expenditures per student are similar whether the poverty percentage is less than 15 percent or more than 25 percent. The expenditure disparity between districts enrolling the lowest percentages of students in poverty and the other districts depends on the resource measure used. The degree of variation is the greatest in terms of unadjusted, actual dollars. However, when actual dollars (table 2, column 1) are adjusted to reflect resource-cost and student-need variations, this differential is reduced somewhat (table 2, column 2). When other factors that might affect the relationship between expenditures and poverty are taken into account through the multivariate analysis (e.g., income and property wealth), the unadjusted dollar variation associated with poverty is seen to be smaller (column 3). This suggests that of the actual expenditure difference of $1,392 between the highest and lowest poverty districts ($6,565 - $5,173), all but $574 ($5,689 - $5,115) can be better explained in terms of other types of differences between these same districts.

Table 2.-- Total expenditures per student by percentage of school-age children in poverty

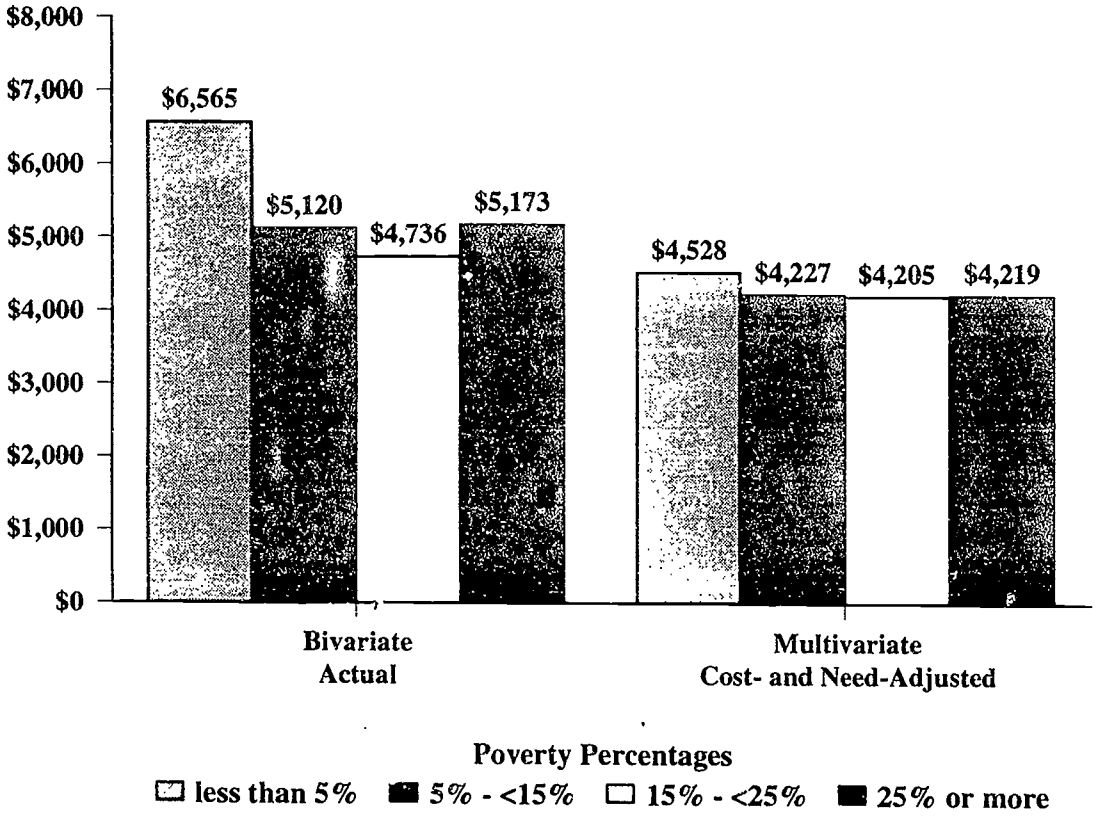
District Characteristic	Percentage of Enrollment	Bivariate Results		Multivariate Results	
		Actual (1)	Cost- and Need-Adjusted (2)	Unadjusted Estimates (3)	Cost- and Need-Adjusted Estimates (4)
School-Age Children in Poverty					
Less than 5%	11.3	$6,565	$5,209	$5,689	$4,528
5% - <15%	36.0	5,120	4,289	5,176	4,227
15% - <25%	26.3	4,736	4,003	5,091	4,205
25% or more	26.4	5,173	4,044	5,115	4,219

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set 1).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

The fully adjusted differential in expenditures between students in the districts enrolling the lowest and the highest percentages of students in poverty is shown to be $309 ($4,528 - $4,219). It is also important to note that very little relationship between expenditures and poverty is shown for three of the four district poverty groupings. This overall pattern between expenditures and the percentage of students in poverty holds across all four columns of analyses. Only in the lowest poverty districts (less than 5 percent) are expenditures consistently higher, and in fully adjusted terms this differential is reduced to about 7 percent ($4,219 versus $4,528).[4]

[4] These findings differ from earlier analyses of the relationship between education expenditures and poverty conducted by Schwartz and Moskowitz (1988). Their state-by-state analyses reported 3 states with negative correlations, 14 states near zero, and 33 states with a positive relationship between the two variables. To further test our findings, which are based on more current data and evaluate this relationship on a national basis, we ran analyses dividing the districts into exact poverty quartiles. We also ran a straight correlation between the various measures of education spending used in this report and the percentage of school-age children in poverty. In each case we found a negative relationship between spending and poverty. Further analyses would be required to determine whether these contradictory findings represent a change over time (the Schwartz and Moskowitz poverty data are from 1979, while the data used in this report are from the 1990 census) or represent differences in the unit of analysis and in the methodological approach.

Figure 2.-- Actual and adjusted total expenditures per student by percentage of school-age children in poverty



SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

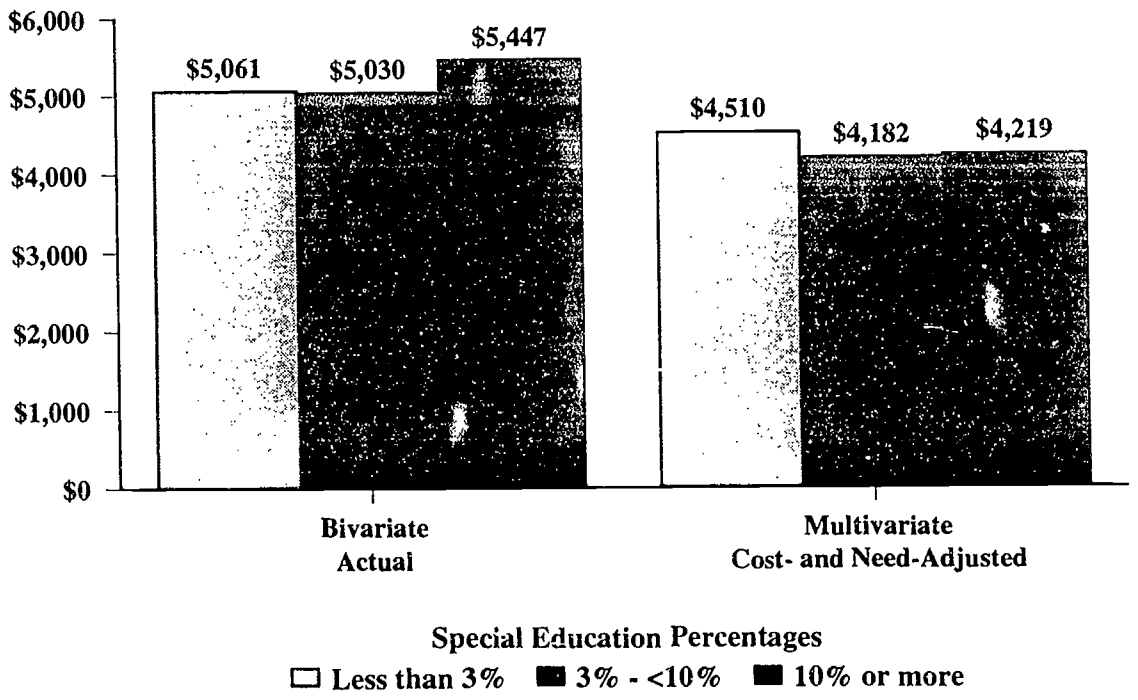
Special education students. Students in districts with the highest percentages of students in special education show higher overall actual expenditures (table 3 and figure 3). However, when these expenditures are expressed in fully adjusted terms, the opposite is true. That is, although districts with higher percentages of special education students receive supplemental resources to serve those students, these additional funds appear to be insufficient to offset the supplemental cost of these programs.

Table 3.-- Total expenditures per student by percentage of special education students

District Characteristic	Percentage of Enrollment	Bivariate Results		Multivariate Results	
		Actual (1)	Cost- and Need-Adjusted (2)	Unadjusted Estimates (3)	Cost- and Need-Adjusted Estimates (4)
Special Education Students					
Less than 3%	17.3	$5,061	$4,692	$4,932	$4,510
3% - <10%	44.2	5,030	4,060	5,093	4,182
10% or more	38.5	5,447	4,278	5,433	4,219

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set 1).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Figure 3.-- Actual and adjusted total expenditures per student by percentage of special education students



SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set 1).
NOTE: All results are weighted by district enrollment.

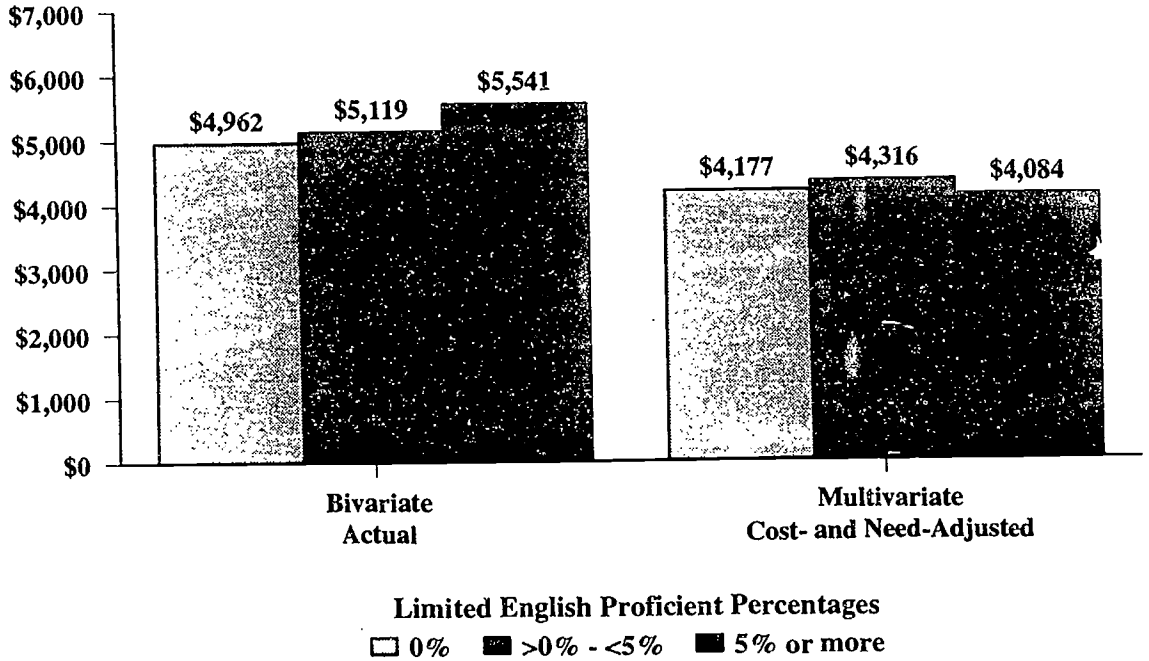
Limited English proficient (LEP) children. As shown in table 4 and figure 4, students in districts with the highest percentages of LEP students also show higher overall actual expenditures. However, on a cost- and need-adjusted basis, these districts show the lowest average expenditures. These findings are predicated on the assumption that a weight of 1.2 is a reasonably accurate reflection of the supplemental costs of serving LEP students.

Table 4.-- Total expenditures per student by percentage of limited English proficient children

District Characteristic	Percentage of Enrollment	Bivariate Results		Multivariate Results	
		Actual (1)	Cost- and Need-Adjusted (2)	Unadjusted Estimates (3)	Cost- and Need-Adjusted Estimates (4)
Limited English Proficient Children					
0%	9.3	$ 4,962	$4,333	$5,061	$4,177
>0% - <5%	69.0	5,119	4,308	5,234	4,316
5% or more	21.6	5,541	4,043	5,133	4,084

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set 1).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Figure 4.-- Actual and adjusted total expenditures per student by percentage of limited English proficient children



SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set 1).
NOTE: All results are weighted by district enrollment.

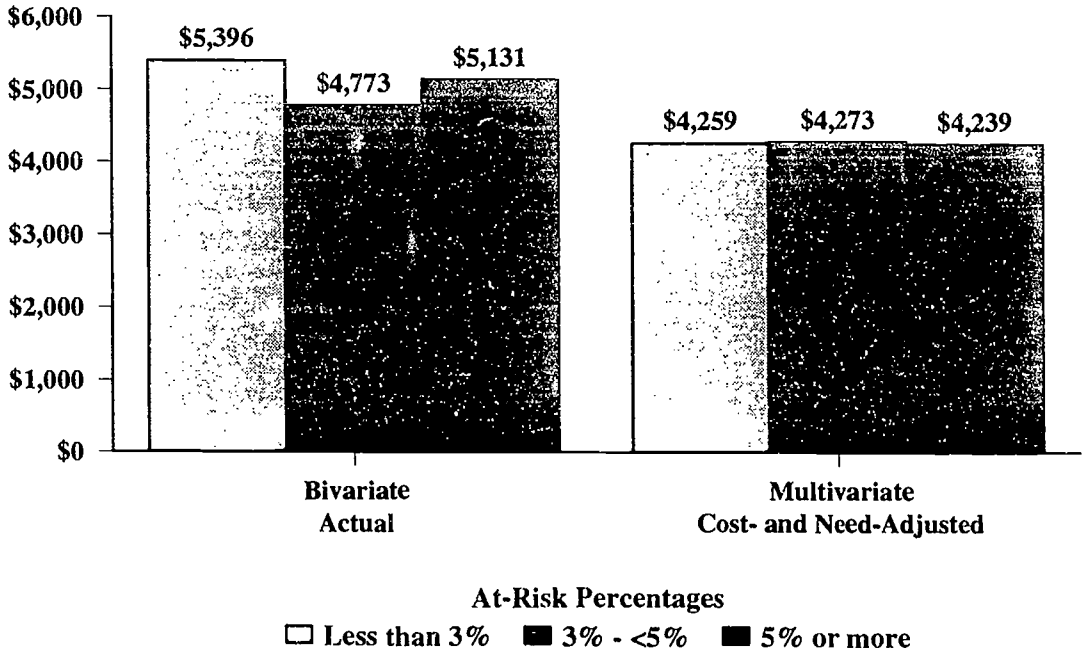
School-age at-risk children. This category represents the percentage of school-age children residing within district boundaries, living with a single parent who is not a high school graduate and who lives below the poverty level. Although the bivariate results shown in table 5 and figure 5 indicate lower expenditures in districts enrolling 3 to less than 5 percent and 5 percent or more at-risk children, these differentials are almost entirely explainable as the effects of other related variables, as shown in the multivariate results.

Table 5.-- Total expenditures per student by percentage of school-age at-risk children

District Characteristic	Percentage of Enrollment	Bivariate Results		Multivariate Results	
		Actual (1)	Cost- and Need-Adjusted (2)	Unadjusted Estimates (3)	Cost- and Need-Adjusted Estimates (4)
School-Age At-Risk Children					
Less than 3%	45.4	$5,396	$4,493	$5,220	$4,259
3% - <5%	15.4	4,773	4,045	5,223	4,273
5% or more	39.2	5,131	4,057	5,157	4,239

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Figure 5.-- Actual and adjusted total expenditures per student by percentage of school-age at-risk children



SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

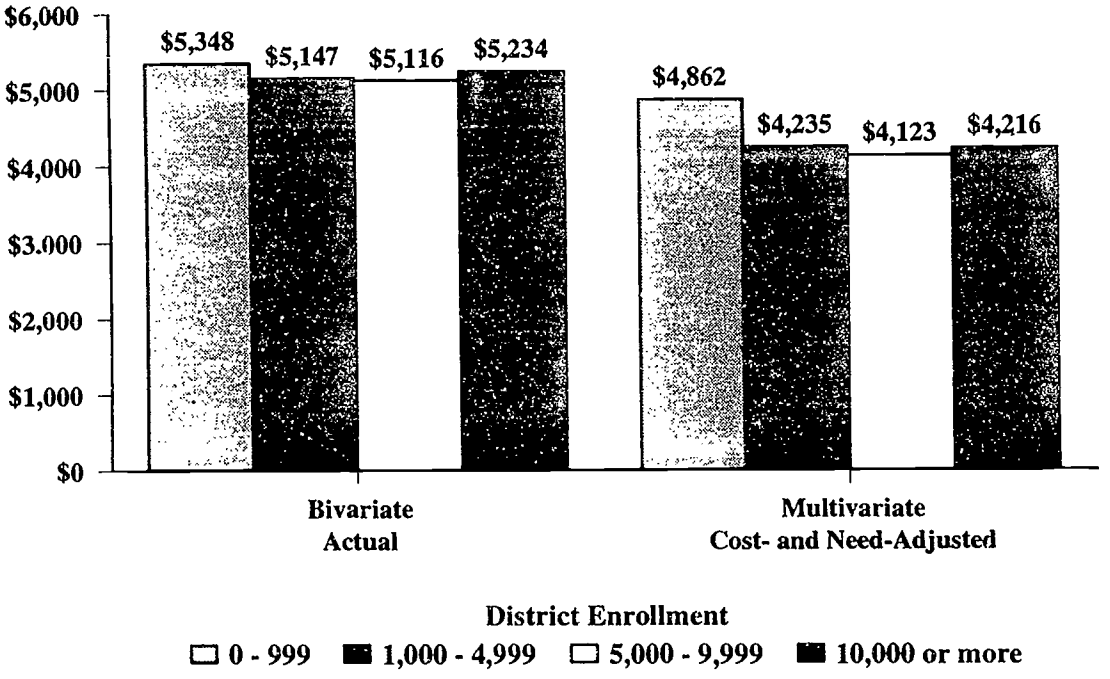
District enrollment. In actual dollars, districts spend about the same amount per student irrespective of district size. However, as shown in table 6 and figure 6, the multivariate analysis of adjusted expenditures shows expenditures per student to be highest in districts enrolling fewer than 1,000 students, other factors being equal, than in districts of all other sizes. The fact that this variation is more pronounced in the multivariate analysis shows a strong relationship between small district size and expenditures, and suggests that differences in district size may underlie some of the other relationships observed in the bivariate analysis, such as that between urbanicity and expenditures. While about one-half (52.2 percent) of the districts in the country fit into this classification, they serve only 7.1 percent of the nation's public school children.

Table 6.-- Total expenditures per student by district enrollment

District Characteristic	Percentage of Enrollment	Bivariate Results		Multivariate Results	
		Actual (1)	Cost- and Need-Adjusted (2)	Unadjusted Estimates (3)	Cost- and Need-Adjusted Estimates (4)
District Enrollment					
0 - 999	7.1	$5,348	$4,663	$5,095	$4,862
1,000 - 4,999	30.9	5,147	4,334	5,199	4,235
5,000 - 9,999	16.2	5,116	4,194	5,090	4,123
10,000 or more	45.8	5,234	4,155	5,120	4,216

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Figure 6.-- Actual and adjusted total expenditures per student by district enrollment



SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

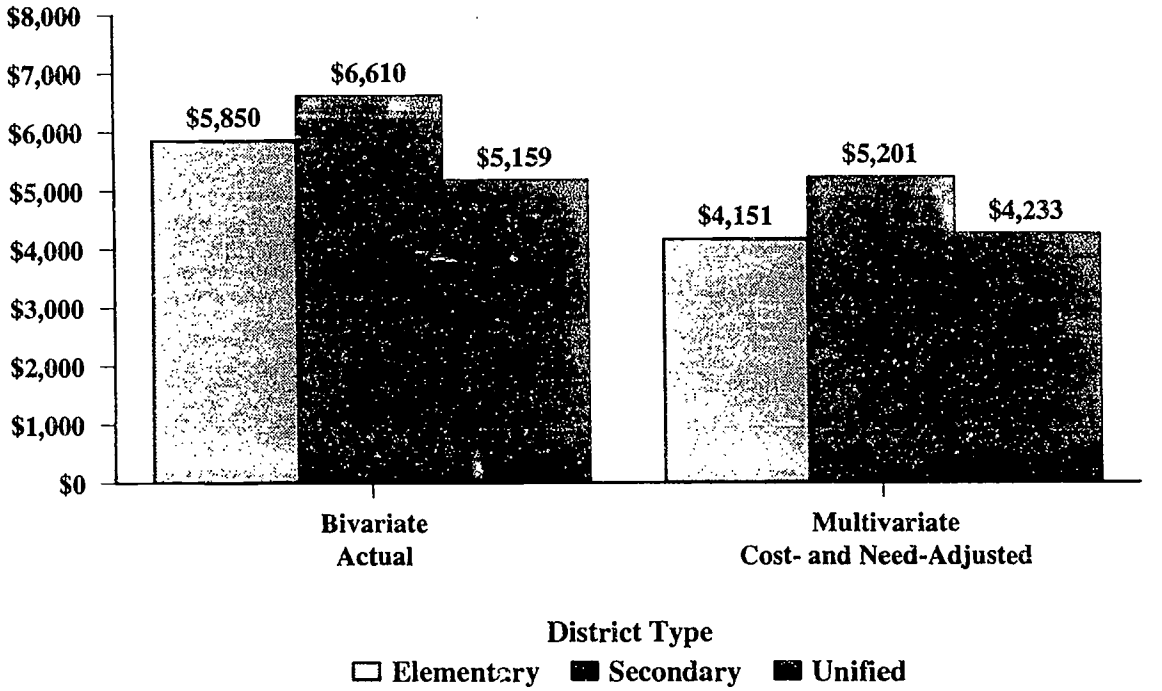
District type. District type refers to the level of instruction provided in the district (i.e., whether it is an elementary, secondary, or unified district). While the vast majority of students (97 percent) are enrolled in unified districts, which serve both elementary and secondary students, a small percentage of students is enrolled in districts serving only elementary or only secondary students. Because it is more costly to serve high school students (Hertert, Busch, and Odden 1994), it is not surprising to see, as shown in table 7 and figure 7, that districts serving only high school students have higher average expenditures per student. Although actual levels of expenditure are clearly higher in elementary than in unified districts (column 1), in terms of actual buying power the differential shown in this two-way relationship diminishes substantially (column 2). Much of the variation in actual expenditures is likely due to the fact that elementary districts tend to be located in high cost areas. When all other variables included in this analysis are taken into account, as shown in columns 3 and 4, elementary district expenditures are shown to be essentially the same as for unified districts. This is surprising in that unified districts serve secondary, as well as elementary, students. Unified districts may be able to spend less by sharing administrative costs across all grade levels.

Table 7.-- Total expenditures per student by district type

		Bivariate Results		Multivariate Results	
District Characteristic	Percentage of Enrollment	Actual (1)	Cost- and Need-Adjusted (2)	Unadjusted Estimates (3)	Cost- and Need-Adjusted Estimates (4)
District Type					
Elementary	0.9	$5,850	$4,382	$5,102	$4,151
Secondary	2.2	6,610	5,134	6,493	5,201
Unified	97.0	5,159	4,232	5,168	4,233

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Figure 7.-- **Actual and adjusted total expenditures per student by district type**



SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

Detailed findings by community characteristics.

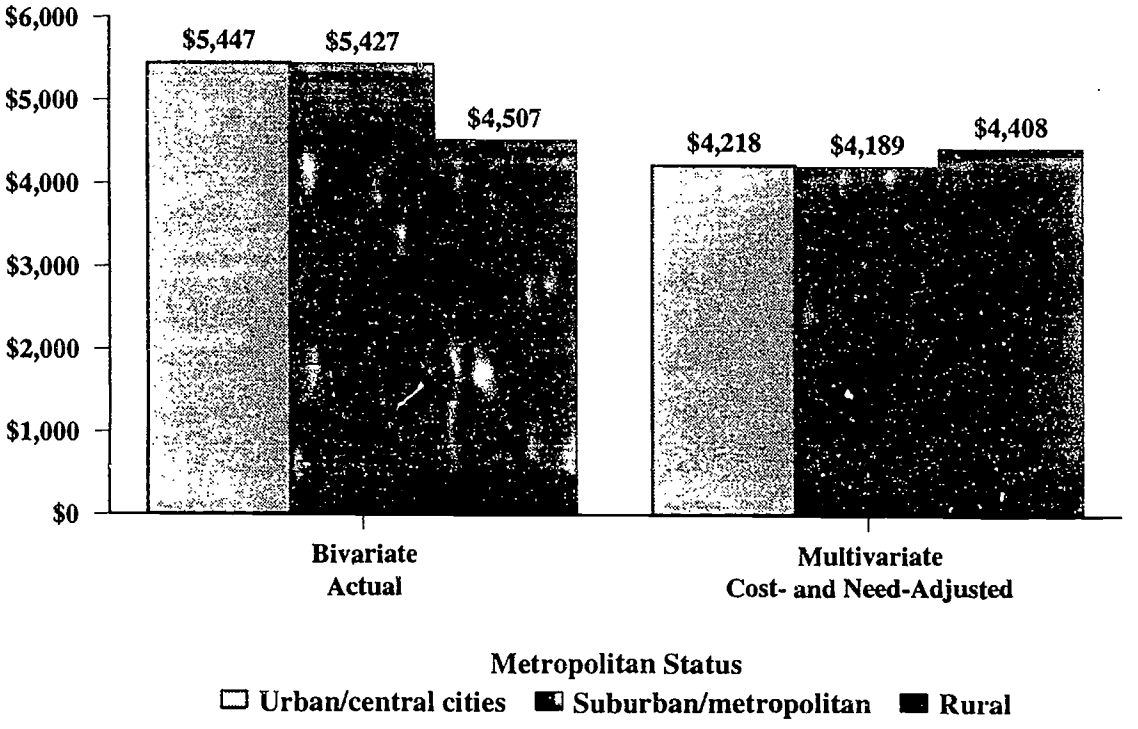
Metropolitan status. As shown in table 8, although actual expenditures per student are substantially lower in rural districts (column 1), this bivariate differential is reduced substantially when expressed in adjusted terms (column 2). This is largely due to the lower costs exhibited in rural areas. (The detailed results presented in table A3.2 show this to be predominantly a cost rather than a student-need effect.) For the multivariate analysis, while actual expenditures are shown to be somewhat smaller in the rural areas (column 3), on a fully adjusted basis they are shown to be higher than for urban or suburban districts (column 4). This suggests that most of the actual expenditure differential observed between rural and other districts is the result of other factors that are related to rural locations (e.g., district size), as well as lower costs in rural areas. (See also figure 8.)

Table 8.-- Total expenditures per student by metropolitan status

Community Characteristic	Percentage of Enrollment	Bivariate Results		Multivariate Results	
		Actual (1)	Cost- and Need-Adjusted (2)	Unadjusted Estimates (3)	Cost- and Need-Adjusted Estimates (4)
Metropolitan Status					
Urban/central cities	26.9	$5,447	$4,195	$5,241	$4,218
Suburban/metropolitan	47.3	5,427	4,389	5,198	4,189
Rural	25.7	4,507	4,064	5,145	4,408

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Figure 8.-- Actual and adjusted total expenditures per student by metropolitan status



SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

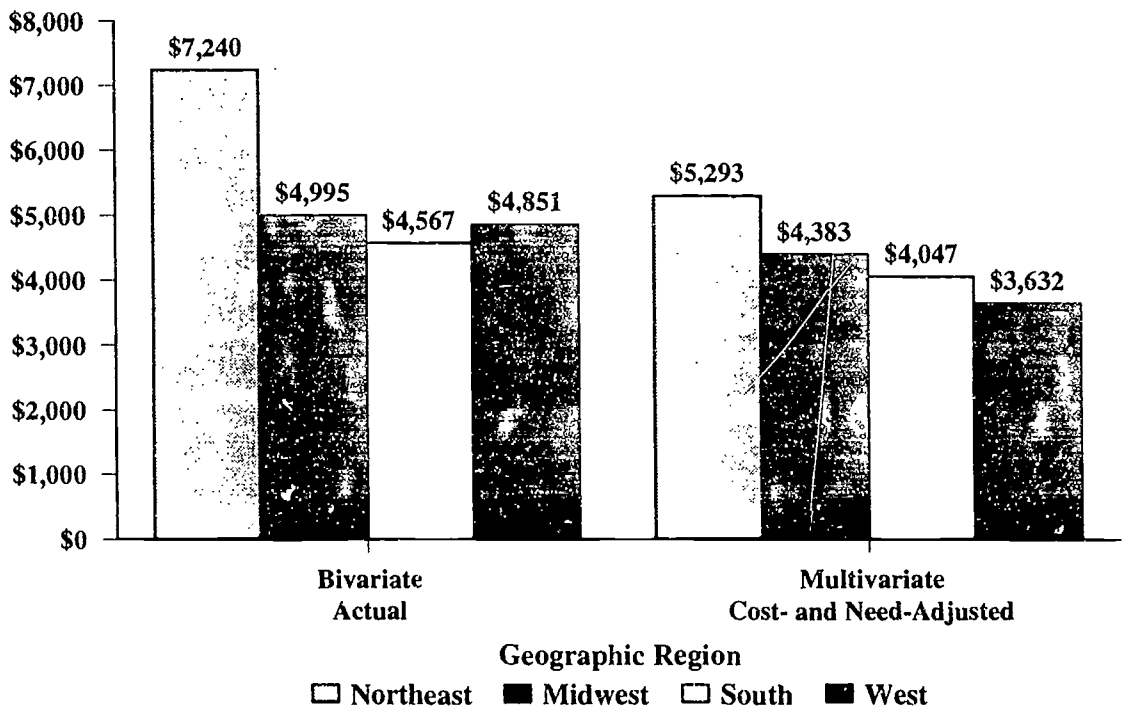
Geographic region. Districts in the northeastern region of the country outspend their counterparts from all other regions by over $2,000, although one-third of this difference is explainable in terms of different resource costs and other district characteristics. Although the South is the lowest spending region in actual dollars (table 9, column 1), in terms of buying power and when other variables are taken into account, southern districts are shown to outspend districts in the western region of the country by a substantial margin. Columns 2 through 4 show a consistent ranking in expenditures per student across the regions, with the Northeast spending the most, the Midwest second, the South third, and the West the least. (See also figure 9.)

Table 9.-- Total expenditures per student by geographic region

Community Characteristic	Percentage of Enrollment	Bivariate Results		Multivariate Results	
		Actual (1)	Cost- and Need-Adjusted (2)	Unadjusted Estimates (3)	Cost- and Need-Adjusted Estimates (4)
Geographic Region					
Northeast	17.3	$7,240	$5,383	$6,948	$5,293
Midwest	24.5	4,995	4,361	5,336	4,383
South	36.3	4,567	3,948	4,708	4,047
West	22.0	4,851	3,749	4,468	3,632

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Figure 9.-- Actual and adjusted total expenditures per student by geographic region



SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

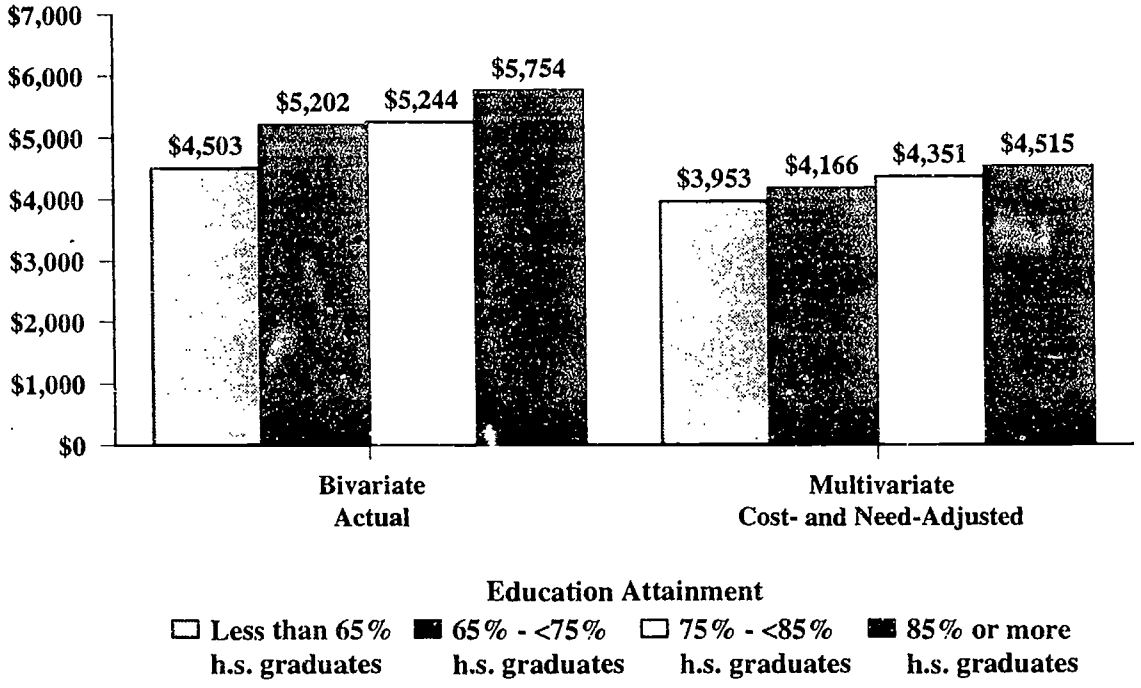
Education attainment of householders. Education expenditures are greatest in communities with the most high school graduates. This is not surprising, as it would be expected that communities with higher education attainment levels would be more willing, and able, to provide local support for public education programs (Riddle 1990). As shown in table 10, roughly half of the expenditure differential between the lowest and highest education attainment groups can be explained by cost and need differences and other factors ($5,754 - $4,503 = $1,251 [column 1]) versus $4,515 - $3,953 = $562 [column 4]). Thus, among districts similar on other factors, those with more than 85 percent high school graduates spend $562 more per student than those with fewer than 65 percent high school graduates, a difference of 14 percent ($4,515 versus $3,953). (See also figure 10.)

Table 10.-- Total expenditures per student by education attainment of householders

Community Characteristic	Percentage of Enrollment	Bivariate Results		Multivariate Results	
		Actual (1)	Cost- and Need-Adjusted (2)	Unadjusted Estimates (3)	Cost- and Need-Adjusted Estimates (4)
Education Attainment of Householders					
Less than 65% high school graduates	18.1	$4,503	$3,766	$4,972	$3,953
65% - <75% high school graduates	31.3	5,202	4,188	5,127	4,166
75% - <85% high school graduates	31.3	5,244	4,328	5,264	4,351
85% or more high school graduates	19.4	5,754	4,681	5,406	4,515

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Figure 10.-- Actual and adjusted total expenditures per student by education attainment of householders



SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

Median value owner-occupied housing.[5] As property taxes provide an important basis of support for public education throughout the states, it is not surprising to see a positive relationship between education expenditures and housing values (table 11). This relationship is still apparent when viewed from the perspective of relative buying power (column 2) and when other related factors are taken into account (column 4). However, when other factors are taken into account and expenditures are fully adjusted, the education expenditure differential between the highest and lowest categories of housing values is reduced from $1,716 ($6,155 - $4,439 [column 1]) to $409 ($4,401 - $3,992 [column 4]). (See also figure 11.)

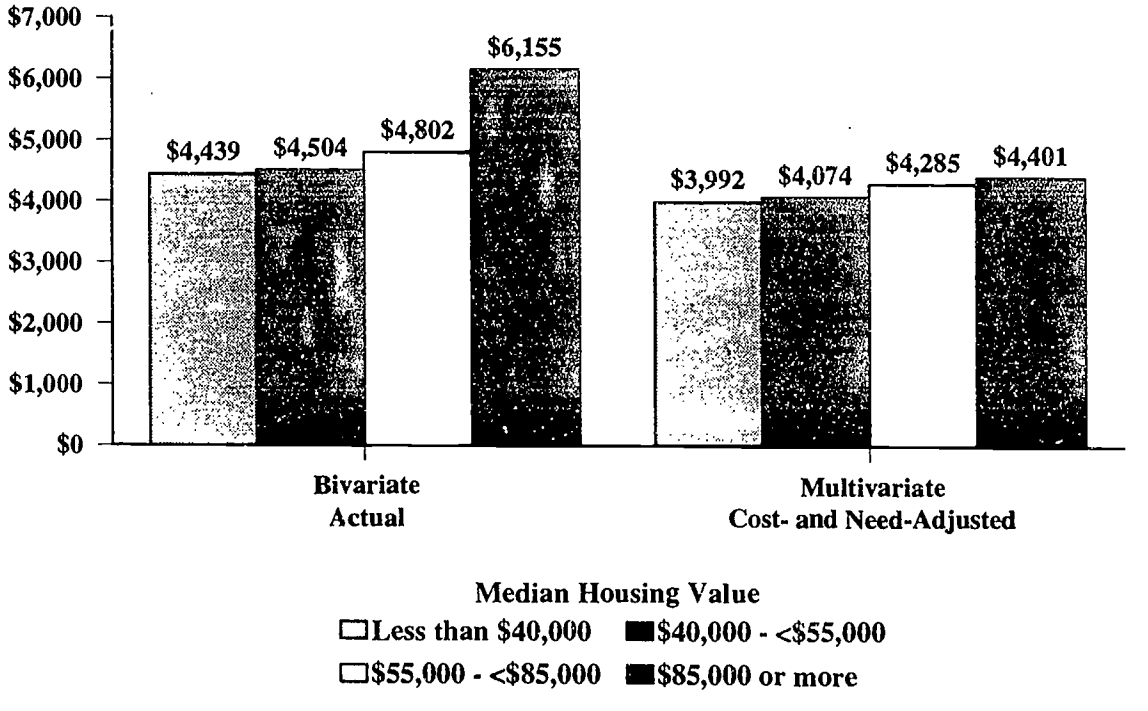
[5] These housing values are based on homeowners' own estimates. Concerns have been expressed about the accuracy of these subjectively derived estimates. However, research found that homeowners overestimate housing values by only 6 percent and that these overestimates are unrelated to homeowner characteristics, the house, and the local market (Goodman and Ittner 1992).

Table 11.-- Total expenditures per student by median value owner-occupied housing

Community Characteristic	Percentage of Enrollment	Bivariate Results: Actual (1)	Bivariate Results: Cost- and Need-Adjusted (2)	Multivariate Results: Unadjusted Estimates (3)	Multivariate Results: Cost- and Need-Adjusted Estimates (4)
Median Value Owner-Occupied Housing					
Less than $40,000	10.8	$4,439	$3,895	$4,634	$3,992
$40,000 - <$55,000	20.2	4,504	3,947	4,751	4,074
$55,000 - <$85,000	32.5	4,802	4,157	5,074	4,285
$85,000 or more	36.5	6,155	4,615	5,717	4,401

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Figure 11.-- Actual and adjusted total expenditures per student by median value owner-occupied housing



SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

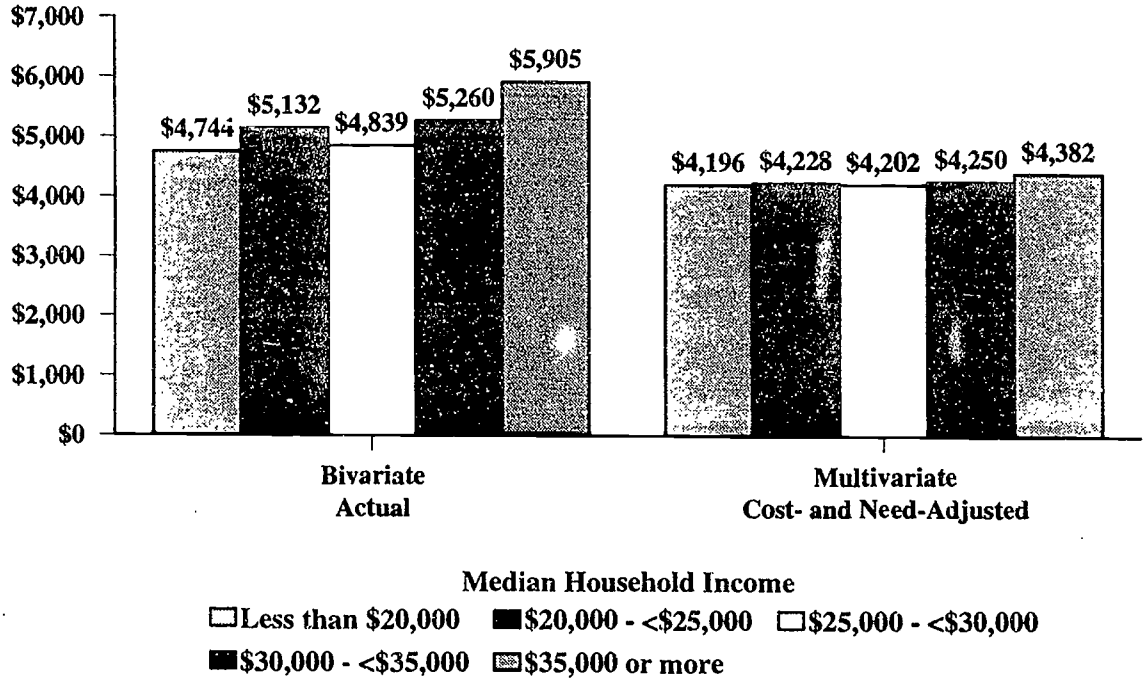
Median household income (cost-adjusted). A positive relationship between household income and expenditures is observed in table 12. This bivariate relationship also generally holds when expenditures are considered on an adjusted basis (column 2). However, when these two variables are compared on a cost- and need-adjusted basis in the multivariate analysis (column 4), these expenditure differentials are substantially diminished. Expenditures per student for the highest income category exceeded those for the lowest income category by an average of $186 ($4,382 - $4,196 from column 4). While a positive relationship between income and expenditures generally holds across this analysis, the multivariate analysis shows that this relationship is due to differences in student needs and resource costs, and to other variations included in the multivariate analysis. (See also figure 12.)

Table 12.-- Total expenditures per student by median household income (cost-adjusted)

Community Characteristic	Percentage of Enrollment	Bivariate Results		Multivariate Results	
		Actual (1)	Cost- and Need-Adjusted (2)	Unadjusted Estimates (3)	Cost- and Need-Adjusted Estimates (4)
Median Household Income					
Less than $20,000	10.0	$4,744	$3,894	$5,324	$4,196
$20,000 - <$25,000	27.9	5,132	4,101	5,279	4,228
$25,000 - <$30,000	25.9	4,839	4,078	5,127	4,202
$30,000 - <$35,000	15.8	5,260	4,337	5,109	4,250
$35,000 or more	20.5	5,905	4,792	5,175	4,382

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Figure 12.-- Actual and adjusted total expenditures per student by median household income (cost-adjusted)



SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

What appear to be the overall effects of the various types of adjustments on the observed expenditure patterns? One consistent effect is a reduction in the observed expenditure differential as the various adjustments are applied. For 9 of the 12 variables, the expenditure gap diminishes between the top and bottom district groups as they are transformed from their actual to fully adjusted forms. Generally, this would be expected. For example, because state and federal education aid formulas are designed to allocate more resources to districts with concentrations of students with special needs, all else equal, higher expenditures would be expected in districts with the most special needs students. Thus, it is not surprising to see the observed differential in expenditure per student drop across districts when these variations in student need are taken into account through the application of the student-need adjustments (columns 2 and 4).

Applying the resource-cost adjustments that are reflected in columns 2 and 4 also often results in reductions in observed expenditure variations across districts. Because the highest cost centers are generally heavily urbanized areas with a more substantial local tax base, they tend to show higher education expenditures. However, because of the higher costs they face, these additional expenditures may not translate into increased purchasing power. Because the resource-cost index adjusts nominal dollars into deflated "purchasing power" dollars, the application of the resource cost index has a general tendency to show diminished adjusted expenditures in high cost areas and increased adjusted expenditures in low cost areas, which generally has an overall effect of reducing the observed differential between the highest and lowest spending districts.

Generally, the use of multivariate analysis techniques also would be expected to lead to a reduction in the size of the observed expenditure differential across districts that can be associated with any single variable. The purpose of multivariate analysis is to sort out the unique relationship between a given independent variable (e.g., percentage of students in poverty) and the dependent variable (expenditures per student) by weighing the effects of a number of related variables simultaneously. Because the bivariate analysis lumps the effect of a given variable such as poverty with all of the other variables that may be correlated with it (e.g., property wealth), the magnitude of a given effect is generally likely to appear much larger in the bivariate results than in the multivariate findings, where only the unique effect of a given variable is estimated.

How Do School Districts Serving Different Types of Students and Communities Allocate Resources Across the Categories of Instruction, Administration, and Capital Outlay?

Questions about how funds for public education are used to purchase education resources are increasingly coming to the forefront of education policy discussions (Picus 1994; Wyckoff 1992; Fischer 1990; Hentschke 1988; Kirst 1988; Ginsburg 1981). What percentage of the education dollar is used for overall administration; what percentage actually arrives at the school level; what percentage is used for direct instruction; and what percentage is used for direct services to children that go beyond the more traditional, purely instructional, function of schools? With

increasing demands for improvement in the quality and quantity of education services at a time when resources for all public services are tightly constrained, there is increasing interest in exactly how public education dollars are being used to provide education services.

To relate the questions stated above to policy alternatives, it is also critical to gain a better understanding of how resource allocation patterns vary for different types of school districts and communities. Comparable total expenditures per student in districts serving very different populations of students may result in very different levels of resources at the classroom level.

For example, concerns are sometimes expressed that despite the substantial flow of dollars to high poverty schools through the federal Chapter 1 program, the learning gap between high and low poverty schools is not closing (Sinclair and Gutmann 1990; Westat, Inc. 1992). However, if instructional services are still relatively insufficient in these schools, or if the education atmosphere is inadequate due to underfunded health, social, and security services, it may not be realistic to expect enhanced education outcomes from this program. Because these analyses of resource allocation patterns within districts are somewhat exploratory within the context of this overall examination of spending in education across the nation, there has been no attempt to control for other district characteristics in the expenditure analysis presented in this section (i.e., to conduct multivariate analyses). Plans for additional analyses of this type are currently being developed.

Summary of findings.

- *Student/teacher ratios vary substantially by district size and region of the country.* In both actual and adjusted terms, the average ratio is over 20 percent larger in the nation's largest districts (10,000 students or more) as opposed to the smallest (less than 1,000 students).[6] In actual terms, the average student/teacher ratio in the

[6] Student/teacher ratios are only adjusted for student-need variations. Because this resource is expressed in actual rather than dollar terms, resource-cost adjustments are inappropriate for this measure.

smallest districts is 15.1 as compared to 18.8 in the largest. These differences are even more pronounced by geographic region of the country, with the Northeast showing an average student/teacher ratio of 15.6 as compared to 21.9 for the West. The Midwest and South show average student/teacher ratios falling between these two values, at 17.3 and 17.1, respectively.

[Note: The following expenditure results were obtained only through bivariate analysis and do not control for other district characteristics. As such, they should be interpreted with greater caution than the results obtained through multivariate analysis.]

- *Districts serving relatively high percentages of students who are in poverty, who are minority, and who are limited English proficient all allocate greater percentages of their available funds for core instructional purposes than do districts serving lower percentages of these same groups of students.*

- *Capital outlay is generally the area most sensitive to variation in total expenditures per student by type of district compared to the categories of instruction and administration.*[7] Districts with less to spend tend to focus on direct instruction and administration at the expense of capital expenditures.

- *The differential between high and low poverty districts is especially pronounced in the area of capital outlay, with the lowest poverty districts showing expenditures that exceed those of the highest poverty districts by 76.7 percent ($795 versus $450 per student).*

[7] For the purposes of this study, capital outlay includes land purchases, building repair and construction, and expenditures on equipment. In subsequent analyses, these categories of capital expenditure might be analyzed in more detail. It should also be noted that these analyses report actual expenditures. While annualized costs are generally considered more appropriate in analyses of capital items, these cost data were not available.

- *Percentage allocations for administrative services are largest in smaller districts, in rural districts, and where housing values and median income are lowest.*

- *The previously reported finding that districts in the northeastern section of the country spend more than the other three regions (the Midwest, the South, and the West) is especially true in the area of administration and support, in which districts in the Northeast outspend their western counterparts by 65.0 percent ($1,371 versus $831 per student).*

Detailed findings by district characteristics. The expenditure tables presented in this section show cost- and need-adjusted percentage expenditures in columns 1 through 3 and cost- and need-adjusted dollars in columns 4 through 6. Tables of bivariate and multivariate results of unadjusted and student-need-adjusted student/teacher ratios and corresponding graphic presentations follow for some of the variables presented in this section. Student/teacher ratios are included in this section because they represent a more concise definition of allocations for core instructional purposes, and they represent real, as opposed to fiscal, resources. Although only those variables with the most pronounced relationship with student/teacher ratios are graphically displayed in the following section, ratios for all of the variables included in the analysis are reported in tables A7 and A12 of Appendix A.

Minority enrollment. As shown in table 13, districts enrolling the largest percentages of minority students also spend a greater percentage of the funds available to them for core instructional purposes. These districts also allocate a lower percentage of funds for administration and capital outlay. In terms of adjusted expenditures, the only systematic relationship shown with minority enrollment is that the low minority districts spend more on general administration and support.

Table 13.-- Percentage and total adjusted expenditures by function, by percentage of minority enrollment

District Characteristic	Percentage Expenditures for			Cost- and Need-Adjusted Expenditures for		
	Core Instruction (1)	General Admin. and Support (2)	Capital Outlay (3)	Core Instruction (4)	General Admin. and Support (5)	Capital Outlay (6)
Minority Enrollment						
Less than 5%	59.8	26.6	13.6	$2,624	$1,166	$599
5% - <20%	60.4	25.6	14.0	2,629	1,112	609
20% - <50%	60.2	25.6	14.2	2,524	1,073	593
50% or more	63.2	25.2	11.6	2,592	1,035	476

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

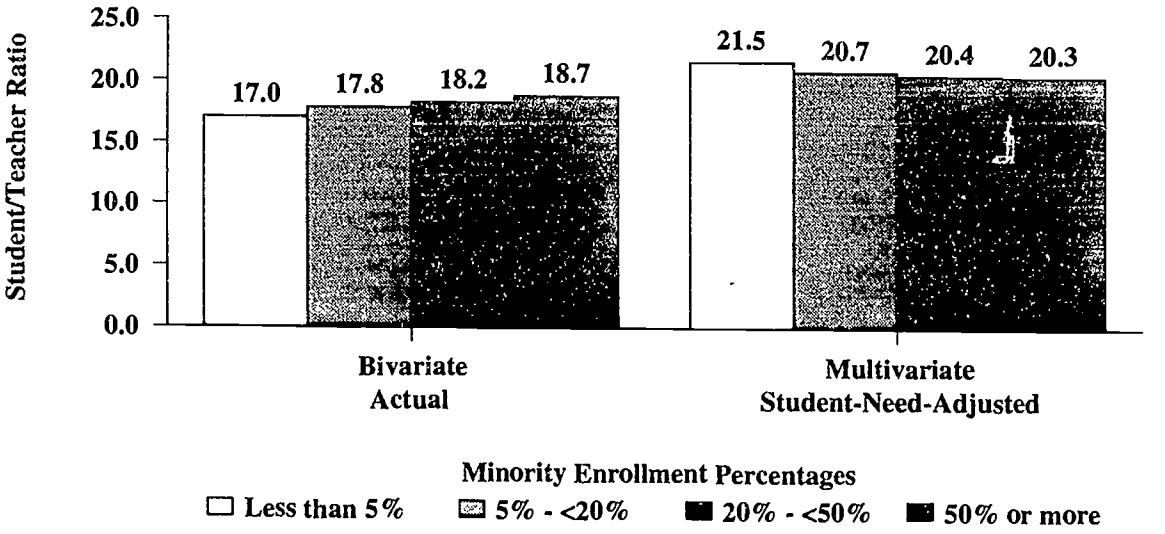
As minority enrollment increases, so does the student/teacher ratio in both actual and student-need-adjusted terms (table 14, columns 1 and 2). The multivariate results (columns 3 and 4) show the opposite pattern, which is similar to the overall expenditure results by minority enrollment (table 1). The student-need-adjusted ratios are important because they reflect the differing composition of the student in a class as well as overall class size. For example, what is considered an appropriate student/teacher ratio is generally dependent on the special needs of the students being served. An appropriate number of students per teacher for students with disabilities, or for students who do not speak English, generally is considered to be different than that for a class with no students with these kinds of special needs. (See also figure 13.)

Table 14.-- Student/teacher ratios by percentage of minority enrollment

District Characteristic	Percentage of Enrollment	Bivariate Results		Multivariate Results	
		Actual (1)	Student-Need-Adjusted (2)	Unadjusted Estimates (3)	Student-Need-Adjusted Estimates (4)
Minority Enrollment					
Less than 5%	21.9	17.0	19.1	18.7	21.5
5% - <20%	26.5	17.8	20.2	18.0	20.7
20% - <50%	25.7	18.2	21.0	17.7	20.4
50% or more	25.9	18.7	22.2	17.5	20.3

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Figure 13.-- Actual and adjusted student/teacher ratios by percentage of minority enrollment



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

School-age children in poverty. Schools in high poverty districts have less to spend, and they sacrifice capital outlay first, allocating a larger percentage of their expenditures to core instruction. As shown in table 15, districts with higher percentages of students in poverty allocate larger percentages of total expenditures to core instructional activities (62.6 percent versus 59.4 percent). In the area of capital expenditures, the lowest poverty districts outspend the highest poverty districts by 76.7 percent ($795 versus $450) in adjusted dollars.

Table 15.-- Percentage and total adjusted expenditures by function, by percentage of school-age children in poverty

District Characteristic	Percentage Expenditures for			Cost- and Need-Adjusted Expenditures for		
	Core Instruction (1)	General Admin. and Support (2)	Capital Outlay (3)	Core Instruction (4)	General Admin. and Support (5)	Capital Outlay (6)
School-Age Children in Poverty						
Less than 5%	59.4	25.4	15.3	$3,092	$1,322	$795
5% - <15%	60.3	25.3	14.4	2,587	1,084	618
15% - <25%	61.1	26.0	13.0	2,444	1,039	520
25% or more	62.6	26.3	11.1	2,531	1,063	450

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

This type of finding raises some important questions regarding the difference between rich and poor schools. The percentages of total expenditures allocated to core instruction and administration and support do not vary as much as expenditures on grounds, buildings, and equipment. If these expenditures are viewed as providing more seating for the football stadium, tennis courts, and swimming pools, many would not consider them to be critical instructional expenditures and therefore might argue that expenditure differentials in these areas are likely to have relatively little impact on instructional outcomes. However, if they are viewed as resulting in serious gaps in such items as computers and science laboratory equipment between rich and poor schools, or if they are viewed in the form of dilapidated and poorly maintained buildings, the

concerns become more difficult to dismiss and seem to reinforce the images portrayed in books describing differences between rich and poor schools (e.g., *Savage Inequalities*). Without more detailed information, it is impossible to say to what extent these capital differences represent important gaps in critical education resources.

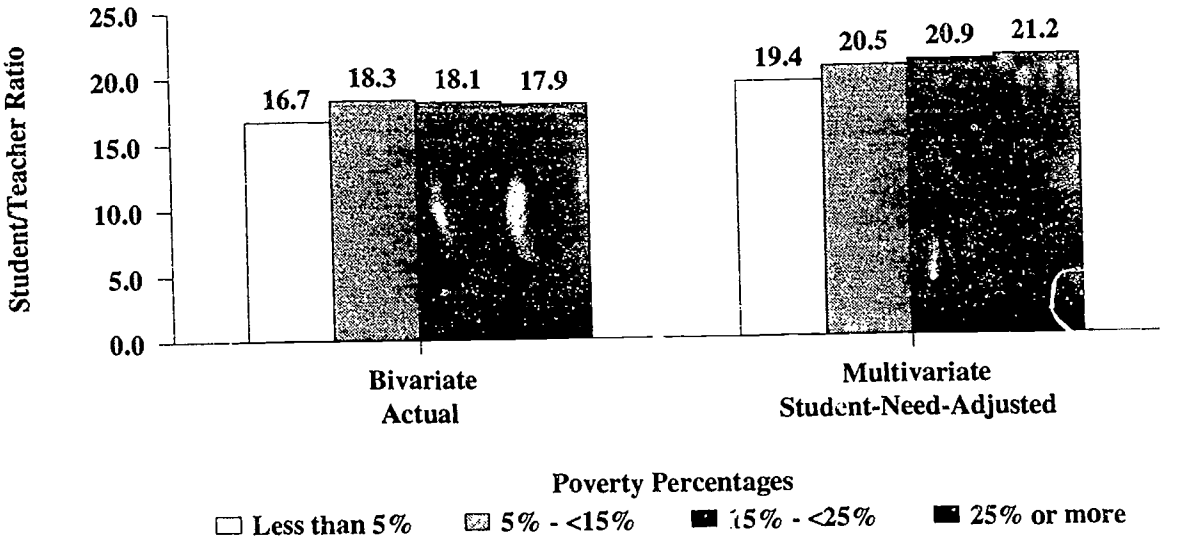
The student/teacher ratios shown in table 16 and figure 14 below also accentuate the differing resource levels between schools in high and low poverty districts. While the actual ratios are only smaller in the lowest poverty districts, on a student-need-adjusted basis, student/teacher ratios are shown to rise steadily with increased school poverty. The multivariate student-need-adjusted student/teacher ratio results show a differential of 9.3 percent (19.4 versus 21.2) between the lowest and the highest poverty districts: This is much smaller than the adjusted core instruction expenditure differential noted for these two groups (22.2 percent). This shows that although higher poverty districts spend a substantially smaller amount of core expenditures per student than low poverty districts, student/teacher ratios do not differ to the same degree.

Table 16.-- Student/teacher ratios by percentage of school-age children in poverty

District Characteristic	Percentage of Enrollment	Bivariate Results		Multivariate Results	
		Actual (1)	Student-Need-Adjusted (2)	Unadjusted Estimates (3)	Student-Need-Adjusted Estimates (4)
School-Age Children in Poverty					
Less than 5%	11.3	16.7	18.4	17.1	19.4
5% - <15%	36.1	18.3	20.7	17.9	20.5
15% - <25%	26.4	18.1	21.0	18.1	20.9
25% or more	26.1	17.9	21.3	18.2	21.2

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Figure 14.-- Actual and adjusted student/teacher ratios by percentage of school-age children in poverty



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

Limited English proficient (LEP) children. As shown in table 17, students in districts with the highest percentages of LEP students also allocate larger percentages of expenditure to core instructional services; this comes at the expense of administration and capital outlay. In terms of expenditures per student, the districts with the largest percentages of LEP students spend 2.7 percent more ($2,608 versus $2,539) on core instruction, 20.0 percent less ($940 versus $1,175) on administration, and 20.0 percent less ($495 versus $619) on capital outlay.

Table 17.-- Percentage and total adjusted expenditures by function, by percentage of limited English proficient children

District Characteristic	Percentage Expenditures for			Cost- and Need-Adjusted Expenditures for		
	Core Instruction (1)	General Admin. and Support (2)	Capital Outlay (3)	Core Instruction (4)	General Admin. and Support (5)	Capital Outlay (6)
Limited English Proficient Children						
0%	58.6	27.1	14.3	$2,539	$1,175	$619
>0% - <5%	60.2	26.3	13.6	2,593	1,131	584
5% or more	64.5	23.3	12.2	2,608	940	495

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

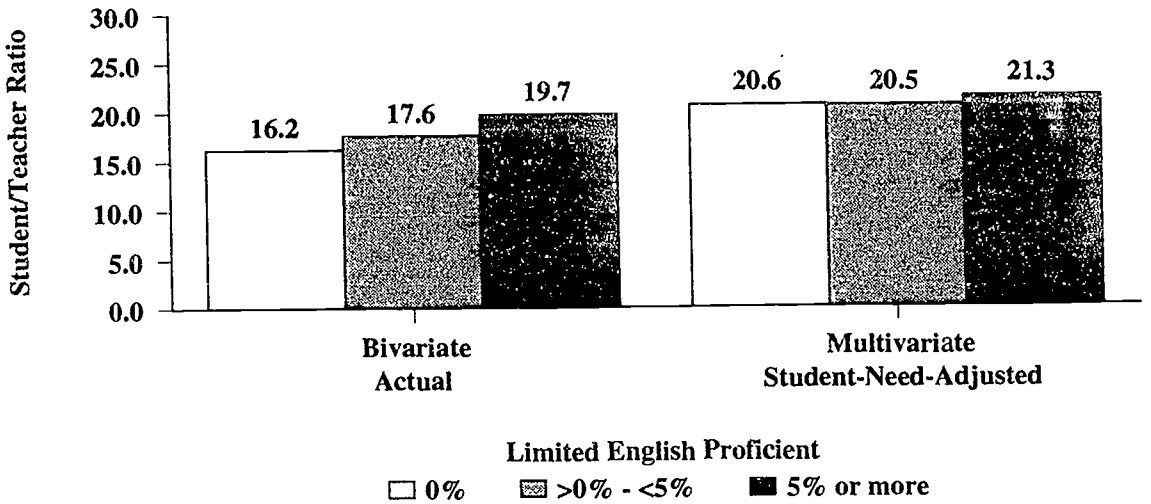
Bivariate results in table 18 (columns 1 and 2) show that student/teacher ratios rise steadily with percentage LEP. On a student-need-adjusted basis, this ratio is 25.9 percent larger (23.3 versus 18.5) for districts in communities in which the largest percentages of LEP children reside than for their counterparts with the lowest percentages of LEP children. This pattern is not as pronounced in the multivariate results (figure 15).

Table 18.-- Student/teacher ratios by percentage of limited English proficient children

District Characteristic	Percentage of Enrollment	Bivariate Results		Multivariate Results	
		Actual (1)	Student-Need-Adjusted (2)	Unadjusted Estimates (3)	Student-Need-Adjusted Estimates (4)
Limited English Proficient Children					
0%	9.3	16.2	18.5	18.0	20.6
>0% - <5%	69.4	17.6	20.2	17.8	20.5
5% or more	21.3	19.7	23.3	18.3	21.3

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Figure 15.-- Actual and adjusted student/teacher ratios by percentage of limited English proficient children



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

School-age at-risk children. Similar to districts serving students in poverty, districts serving the largest percentages of students at-risk have somewhat fewer dollars to spend overall, as shown in table 19. They also allocate a larger percentage of their expenditures to core instructional services (61.8 percent versus 60.2 percent) at the expense of capital outlay (12.1 percent versus 14.3 percent). However, despite the greater outlay for instruction as a percentage of total expenditures, districts serving the highest percentages of at-risk students still spend less in adjusted dollars for core instructional services. The greatest area of disparity is again in capital outlay, where districts serving the highest percentages of at-risk students spend only 76.4 percent ($492 versus $644) as much as districts with the lowest percentages of at-risk students. (See tables A7.1 and A12 for student/teacher ratios by percentage of school-age at-risk children.)

Table 19.-- Percentage and total adjusted expenditures by function, by percentage of school-age at-risk children

District Characteristic	Percentage Expenditures for			Cost- and Need-Adjusted Expenditures for		
	Core Instruction (1)	General Admin. and Support (2)	Capital Outlay (3)	Core Instruction (4)	General Admin. and Support (5)	Capital Outlay (6)
School-Age At-Risk Children						
Less than 3%	60.2	25.5	14.3	$2,704	$1,145	$644
3% - <5%	61.1	25.7	13.3	2,470	1,038	537
5% or more	61.8	26.0	12.1	2,509	1,056	492

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

District enrollment. As shown in table 20, the nation's smallest districts spend the largest percentage of expenditures on administration. This trend seems to be in keeping with the administrative economies that would be expected to be associated with scale. The existence of such administrative economies also seems to be supported by the adjusted expenditure data. Although the small districts spend more in all three areas, expenditure differentials by district size are less pronounced in the area of core instruction.

Smaller districts also have lower student/teacher ratios. As shown in table 21 and figure 16, in actual terms, the student/teacher ratio in the largest districts is 24.5 percent higher than in the smallest ones (18.8 versus 15.1). In multivariate student-need-adjusted terms, the student/teacher ratio is 20.9 percent higher (21.4 versus 17.7).

Table 20.-- Percentage and total adjusted expenditures by function, by district enrollment

District Characteristic	Percentage Expenditures for			Cost- and Need-Adjusted Expenditures for		
	Core Instruction (1)	General Admin. and Support (2)	Capital Outlay (3)	Core Instruction (4)	General Admin. and Support (5)	Capital Outlay (6)
District Enrollment						
0 - 999	57.4	27.5	15.0	$2,678	$1,284	$701
1,000 - 4,999	60.7	26.3	12.9	2,631	1,142	561
5,000 - 9,999	62.4	25.3	12.4	2,616	1,060	518
10,000 or more	61.2	25.1	13.7	2,543	1,043	569

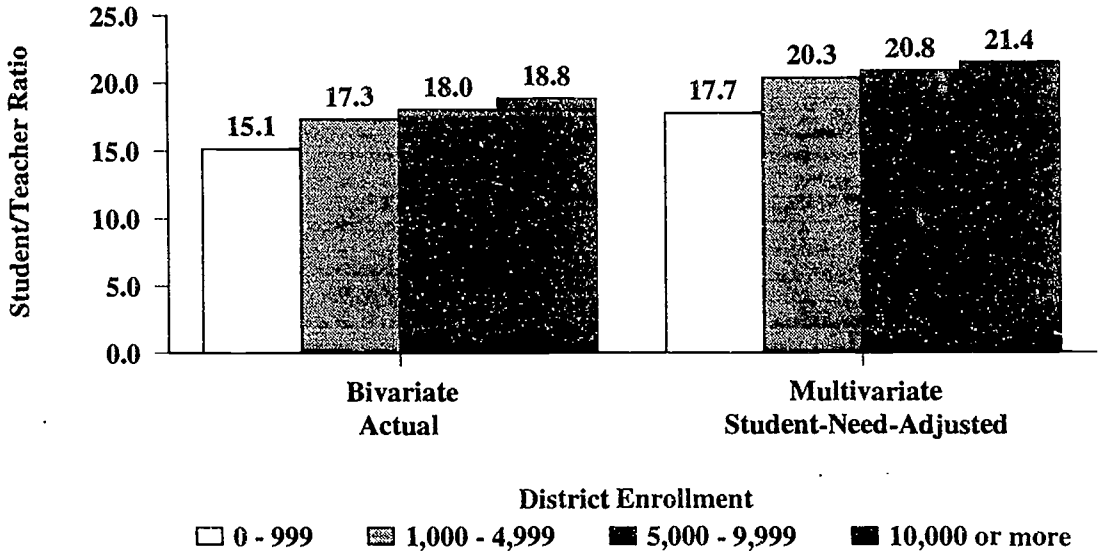
SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations

Table 21.-- Student/teacher ratios by district enrollment

District Characteristic	Percentage of Enrollment	Bivariate Results		Multivariate Results	
		Actual (1)	Student-Need-Adjusted (2)	Unadjusted Estimates (3)	Student-Need-Adjusted Estimates (4)
District Enrollment					
0 - 999	7.2	15.1	17.3	15.3	17.7
1,000 - 4,999	30.9	17.3	19.6	17.6	20.3
5,000 - 9,999	16.2	18.0	20.6	18.1	20.8
10,000 or more	45.7	18.8	22.0	18.5	21.4

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to missing categorization information for some observations.

Figure 16.-- Actual and adjusted student/teacher ratios by district enrollment



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set 1).
NOTE: All results are weighted by district enrollment.

District type. Since elementary, secondary, and unified school districts are quite distinct from one another, and since the sample of elementary and secondary districts is quite small in relation to the vast majority of unified districts, it is not surprising to see that resource allocation patterns vary across these three types of districts (table 22). Secondary districts spend a larger percentage of expenditures on core instruction, unified districts a higher percentage on general administration, and elementary districts substantially more on capital outlay. In terms of adjusted expenditures per student, the secondary districts spend the most in the first two areas, with the elementary districts spending 74.3 percent more than their unified counterparts on capital outlay ($978 versus $561). (See tables A7.1 and A12 for student/teacher ratios by district type.)

Table 22.-- Percentage and total adjusted expenditures by function, by district type

District Characteristic	Percentage Expenditures for			Cost- and Need-Adjusted Expenditures for		
	Core Instruction (1)	General Admin. and Support (2)	Capital Outlay (3)	Core Instruction (4)	General Admin. and Support (5)	Capital Outlay (6)
District Type						
Elementary	57.4	20.2	22.3	$2,517	$ 887	$978
Secondary	62.7	23.7	13.6	3,221	1,217	696
Unified	60.9	25.8	13.3	2,578	1,093	561

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Detailed findings by community characteristics.

Metropolitan status. Urban districts tend to allocate a larger percentage of expenditures to instruction, the rural districts more to administration, and the suburban districts more to capital outlay (table 23). The biggest differential among these three types of districts appears to be in the area of capital outlay, where the suburban districts outspend their counterparts by approximately 25 to 31 percent.

Urban and suburban districts also have larger student/teacher ratios than their rural counterparts in actual terms (18.3 versus 17.0). As shown in table 24, this differential is greatest between urban and rural districts in student-need-adjusted terms (10.2 percent, 21.6 versus 19.6). In multivariate student-need-adjusted terms, suburban districts have higher student/teacher ratios than their urban and rural counterparts (figure 17).

Table 23.-- Percentage and total adjusted expenditures by function, by metropolitan status

Community Characteristic	Percentage Expenditures for			Cost- and Need-Adjusted Expenditures for		
	Core Instruction (1)	General Admin. and Support (2)	Capital Outlay (3)	Core Instruction (4)	General Admin. and Support (5)	Capital Outlay (6)
Metropolitan Status						
Urban/central cities	62.9	25.4	11.7	$2,640	$1,066	$489
Suburban/metropolitan	60.1	25.3	14.7	2,636	1,110	643
Rural	60.5	26.9	12.6	2,459	1,092	513

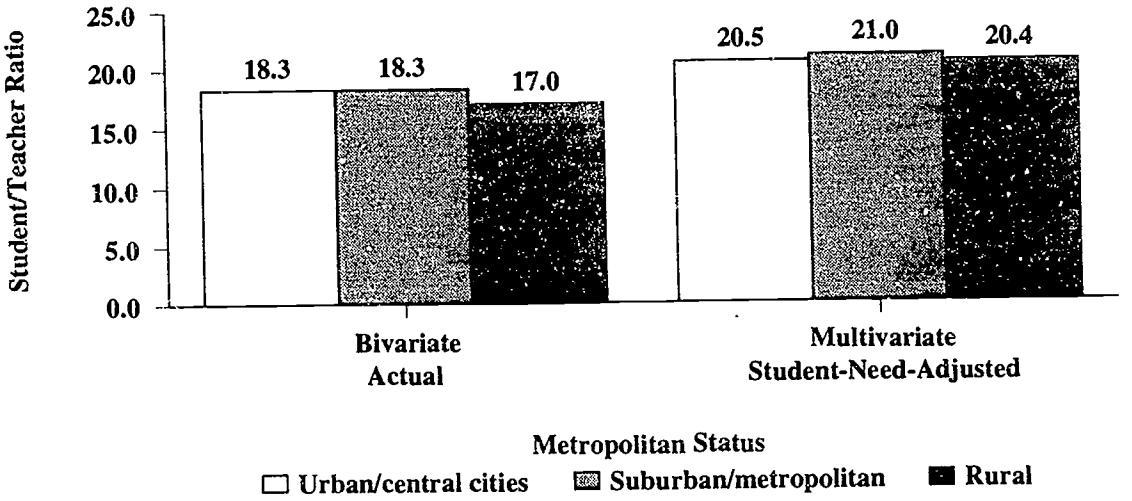
SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to missing categorization information for some observations.

Table 24.-- Student/teacher ratios by metropolitan status

District Characteristic	Percentage of Enrollment	Bivariate Results		Multivariate Results	
		Actual (1)	Student-Need-Adjusted (2)	Unadjusted Estimates (3)	Student-Need-Adjusted Estimates (4)
Metropolitan Status					
Urban/central cities	26.7	18.3	21.6	17.7	20.5
Suburban/metropolitan	47.4	18.3	20.7	18.2	21.0
Rural	25.9	17.0	19.6	17.7	20.4

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Figure 17.-- Actual and adjusted student/teacher ratios by metropolitan status



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

Geographic region. As shown in table 25, public education expenditures in the Northeast well outdistance the other regions of the country. Conversely, the expenditure patterns in the West are the lowest and are somewhat distinctive from those of the other regions. Although the western states have less to spend overall, by using a greater percentage of their funds for core instruction, their expenditures in this area are comparable with districts in the Midwest and South. In adjusted dollars, the Northeast outspends the next highest region, the Midwest, by nearly 30 percent in the area of core instruction ($3,339 versus $2,579), by 13.7 percent for administration ($1,371 versus $1,206), and by 16.8 percent in the area of capital outlay ($673 versus $576).

Just as expenditure differentials are striking across regions, so are the differences in student/teacher ratios (see table 26). In actual terms, the Northeast stands out from the Midwest and South, which stand out from the West. In multivariate student-need-adjusted terms, the West stands alone at a ratio of 25.1 as compared to an average of about 19 for the other three regions (figure 18).

Table 25.-- Percentage and total adjusted expenditures by function, by geographic region

Community Characteristic	Percentage Expenditures for			Cost- and Need-Adjusted Expenditures for		
	Core Instruction (1)	General Admin. and Support (2)	Capital Outlay (3)	Core Instruction (4)	General Admin. and Support (5)	Capital Outlay (6)
Geographic Region						
Northeast	62.0	25.5	12.5	$3,339	$1,371	$673
Midwest	59.1	27.7	13.2	2,579	1,206	576
South	59.6	26.5	13.9	2,354	1,045	549
West	64.3	22.2	13.6	2,410	831	508

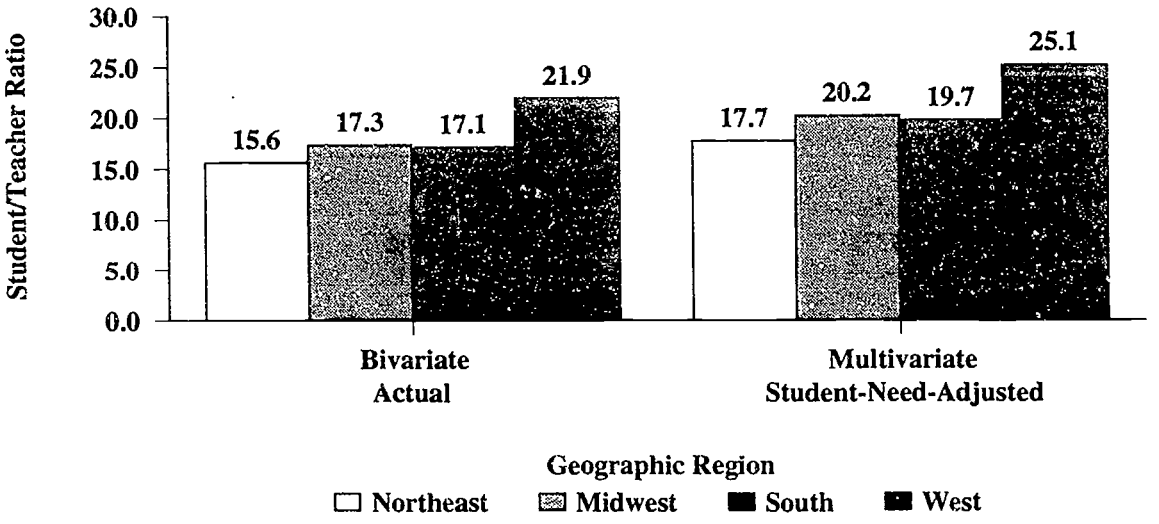
SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table 26.-- Student/teacher ratios by geographic region

District Characteristic	Percentage of Enrollment	Bivariate Results		Multivariate Results	
		Actual (1)	Student-Need-Adjusted (2)	Unadjusted Estimates (3)	Student-Need-Adjusted Estimates (4)
Geographic Region					
Northeast	16.9	15.6	17.8	15.4	17.7
Midwest	24.6	17.3	19.4	17.7	20.2
South	36.4	17.1	20.0	17.0	19.7
West	22.1	21.9	25.5	21.7	25.1

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Figure 18.-- Actual and adjusted student/teacher ratios by geographic region



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

Median household income (cost-adjusted). As shown in table 27, districts in communities with the highest cost-adjusted median household incomes have the highest adjusted public education expenditures per student. Although these districts tend to spend about the same percentage of their funds as others on core instruction, they allocate a higher percentage of their funds to capital outlay. In terms of adjusted expenditures, districts in communities in the highest adjusted income category outspend their lowest income counterparts by 19.0 percent in the area of instruction ($2,868 versus $2,410), 10.7 percent for administration ($1,188 versus $1,073), and 79.1 percent for capital outlay ($736 versus $411). The spending differential in the area of capital outlay increases steadily as the categories of median household income increase. For the two other areas of expenditure, the biggest differences are between the highest income communities and all others. (See tables A7.2 and A12 for student/teacher ratios by median household income [cost adjusted].)

Table 27.-- Percentage and total adjusted expenditures by function, by median household income (cost-adjusted)

Community Characteristic	Percentage Expenditures for			Cost- and Need-Adjusted Expenditures for		
	Core Instruction (1)	General Admin. and Support (2)	Capital Outlay (3)	Core Instruction (4)	General Admin. and Support (5)	Capital Outlay (6)
Median Household Income (cost-adjusted)						
Less than $20,000	61.9	27.6	10.6	$2,410	$1,073	$411
$20,000 - <$25,000	62.0	26.2	11.9	2,541	1,074	486
$25,000 - <$30,000	61.1	25.7	13.2	2,490	1,049	539
$30,000 - <$35,000	60.0	25.2	14.8	2,603	1,091	643
$35,000 or more	59.8	24.8	15.4	2,868	1,188	736

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Median value owner-occupied housing. Although low wealth (housing) districts spend less per student on education, their general administration and support expenditures are slightly higher than in the higher wealth districts, as shown in table 28. This finding reinforces concerns that administrative costs are higher in low wealth districts due to the added need for such support services as security, maintenance, and repair. Spending for core instruction and capital outlay tend to suffer in the low wealth districts. (See tables A7.2 and A12 for student/teacher ratios by median value owner-occupied housing.)

Table 28.-- Percentage and total adjusted expenditures by function, by median value owner-occupied housing

Community Characteristic	Percentage Expenditures for			Cost- and Need-Adjusted Expenditures for		
	Core Instruction (1)	General Admin. and Support (2)	Capital Outlay (3)	Core Instruction (4)	General Admin. and Support (5)	Capital Outlay (6)
Median Value Owner-Occupied Housing						
Less than $40,000	61.1	28.3	10.7	$2,378	$1,102	$415
$40,000 - <$55,000	61.4	27.4	11.2	2,423	1,081	443
$55,000 - <$85,000	59.7	26.0	14.4	2,480	1,080	597
$85,000 or more	61.7	24.1	14.3	2,847	1,110	658

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Education attainment of householders. Districts in communities with the highest percentages of high school graduates spend more in all three categories of expenditure. However, as shown in table 29, the bulk of the extra spending is in capital outlay and core instruction, not in general administration and support. (See tables A7.2 and A12 for student/teacher ratios by education attainment of householders.)

Table 29.-- Percentage and total adjusted expenditures by function, by education attainment of householders

Community Characteristic	Percentage Expenditures for			Cost- and Need-Adjusted Expenditures for		
	Core Instruction (1)	General Admin. and Support (2)	Capital Outlay (3)	Core Instruction (4)	General Admin. and Support (5)	Capital Outlay (6)
Education Attainment of Householders						
Less than 65% high school graduates	62.2	26.8	11.0	2,347	1,013	416
65% - <75% high school graduates	61.5	26.2	12.3	2,576	1,096	516
75% - <85% high school graduates	60.4	25.8	13.8	2,613	1,117	598
85% or more high school graduates	60.0	24.1	15.9	2,808	1,128	745

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

How Do Local, State, and Federal Revenues Vary for School Districts Serving Different Types of Students and Communities?

Our national constitution leaves public education under the authority of the states. In response, all 50 state constitutions contain clauses describing the rights of its school-age citizens to a public education. Whereas public education was funded primarily from local sources until the last 30 years, state contributions have gradually increased over time. Although the balance between local and state revenues varies considerably across the states, in school year 1989-90, state funds for public education across the nation exceeded those from local sources (47.3 percent versus 46.6 percent, Office of Educational Research and Improvement 1994). The expanding state role came as a result of greater demands for funding equalization, increased recognition of the supplemental education needs of certain student populations, and greater realization of the limitations of property taxes as a primary vehicle for supporting education.

The federal government has always been a limited partner in the area of public education, with a revenue share of 6 percent in fiscal year 1990. Chapter 1 of the Elementary and Secondary Education Act (ESEA) of 1965, which was a key component of President Johnson's war on poverty, was the first major effort to supplement public elementary and secondary education funding at the federal level. A second major federal program providing support to public education, which is of particular importance to this analysis, is the Individuals with Disabilities Education Act (IDEA). In keeping with the role that the federal government has assumed in support of public education, both of these major programs target special populations of students. Chapter 1 of ESEA targets federal funds to districts serving students in poverty, while IDEA provides supplemental funding for special education students.

The primary roles of local, state, and federal sources have always differed somewhat. Local funds have traditionally been thought of as providing the basic foundation of general

education support. With increased emphasis on equity and adequacy issues across the states, state funding formulas have aimed to enhance funding equalization in the state and to ensure the provision of some level of adequate or appropriate services. Federal funding sources are almost exclusively targeted toward special needs, to ensure the provision of services for special categories of students.

Given these distinctive local, state, and federal roles, how are different types of school districts and communities supported by local, state, and federal funding sources? Where do federal dollars go? Are greater levels of federal funds found in districts serving high percentages of students in poverty, as intended? To what extent do state funds provide an equalizing effect, and how does this vary by type of community and the students who reside there? How do these three funding sources interact in various settings?

Summary of findings.

- *The amount of local support for public education rises with the wealth and socioeconomic condition of the community.*

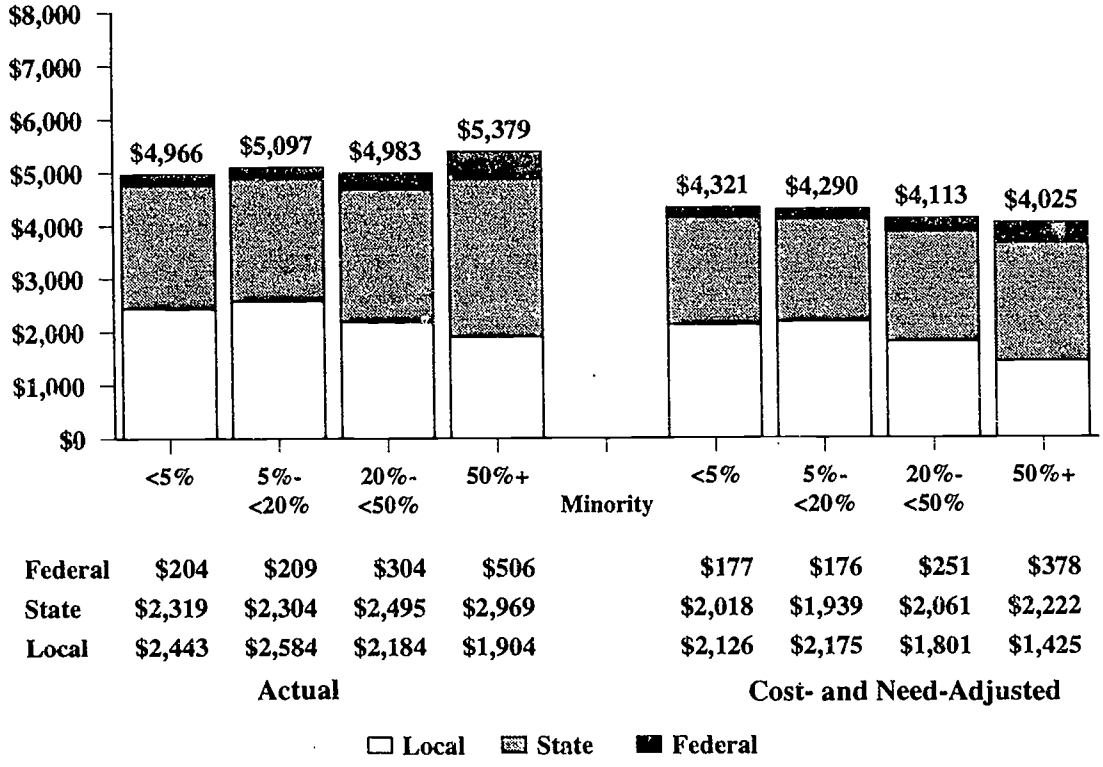
- *State funds are the primary equalizing force in public education resource allocations.* Although this is in keeping with the expected state role, overall the degree of adjustment from state sources appears insufficient to fully offset the impact of local wealth.

- *Although state and federal allocations are larger in absolute terms in districts with large numbers of special education, poverty, and LEP students, it appears that these additional funds may be insufficient to offset the supplemental costs of serving these students.*

Detailed findings by district characteristics.

Minority enrollment. Because minority students are located disproportionately in urban areas where costs are high, the adjusted numbers are especially appropriate for differentiating between local, state, and federal purchasing power as percentage minority changes. The highest minority districts show the lowest level of funds from local sources and the highest level of funds from state and federal aid programs. In adjusted terms, local funds drop substantially from $2,126 in districts with the lowest minority enrollment to $1,425 in districts with the highest minority enrollment, while the amount of state funding only increases somewhat with minority enrollment. Although there are considerably more federal funds in high minority districts, total revenues are the lowest. (See figures 19 and 20.)

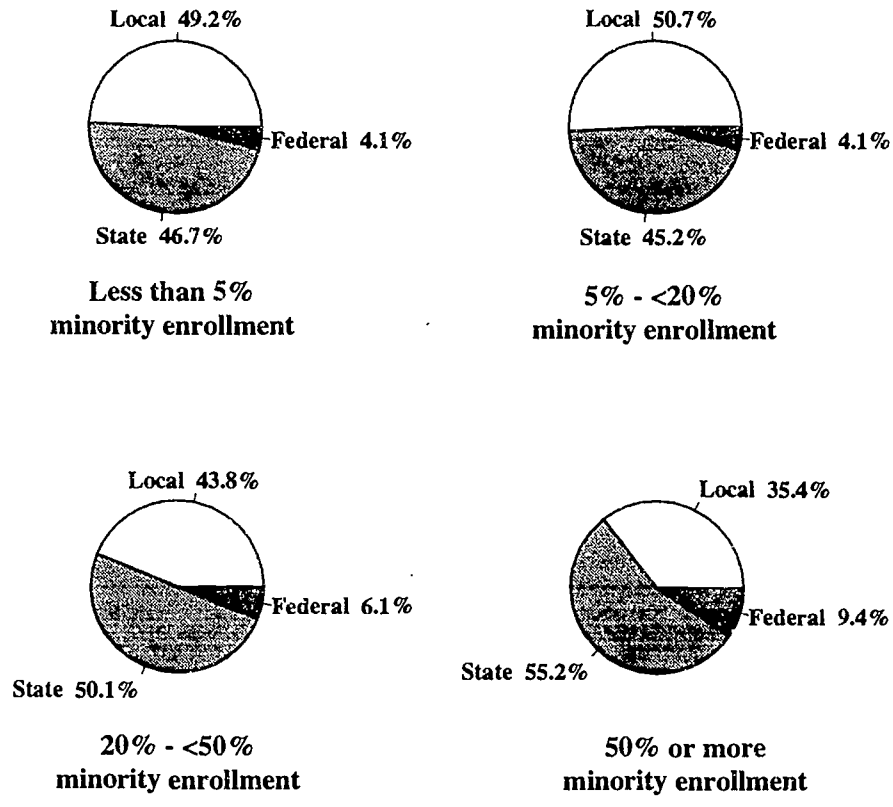
Figure 19.-- Local, state, and federal revenue shares by percentage of minority enrollment



	Actual				Cost- and Need-Adjusted			
Federal	$204	$209	$304	$506	$177	$176	$251	$378
State	$2,319	$2,304	$2,495	$2,969	$2,018	$1,939	$2,061	$2,222
Local	$2,443	$2,584	$2,184	$1,904	$2,126	$2,175	$1,801	$1,425

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

Figure 20.-- Actual local, state, and federal revenue shares by percentage of minority enrollment



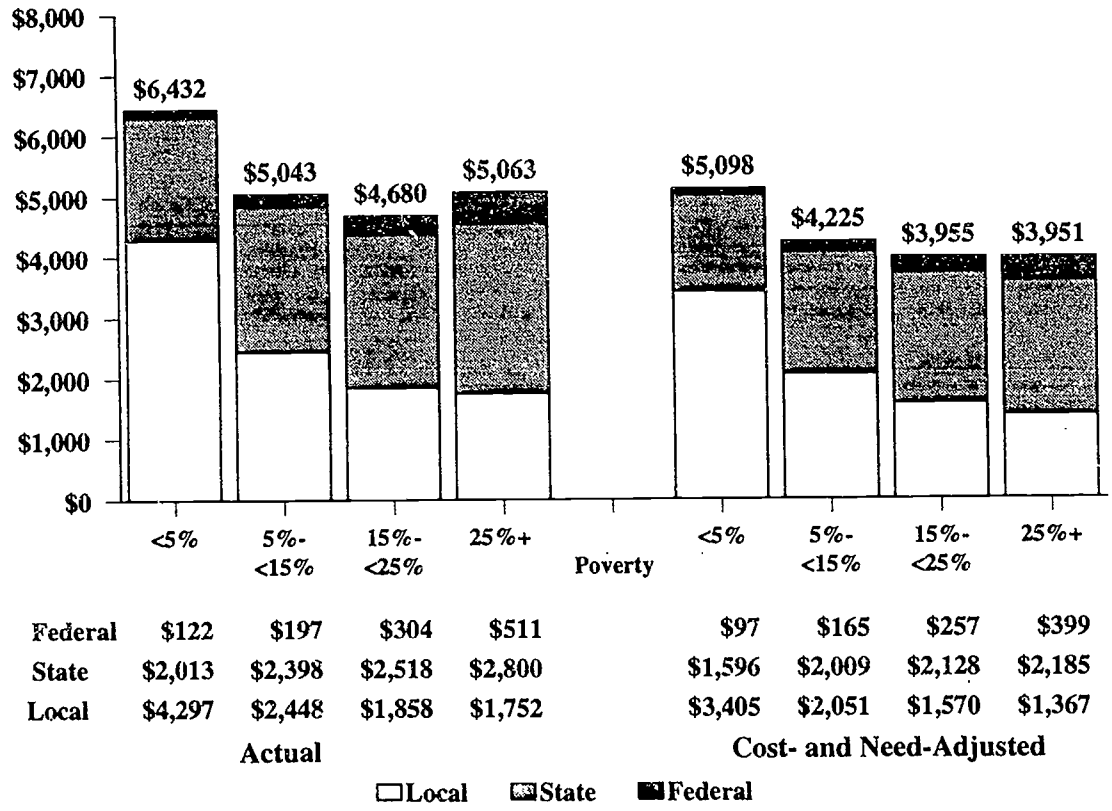
SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data.
NOTE: All results are weighted by district enrollment.

School-age children in poverty. As wealthy communities are better able, and perhaps more inclined, to provide local revenues in support of public education services, it is not surprising to see a substantial negative relation between local revenues per student and the percentage of school-age children in poverty. In both actual and adjusted terms, local revenues per student for districts with low percentages of students in poverty are more than double those for districts in the highest poverty category.

counterbalance to varying levels of local funding, these sources do not fully offset the local funding levels. As shown in figure 21, education funds from state and local sources in the lowest poverty category of districts exceed funding in districts enrolling the highest percentages of children in poverty by 38.6 percent in actual terms ($6,310 versus $4,552) and by 40.8 percent in adjusted dollars ($5,001 versus $3,552).

In percentage terms, federal funding allocations have a much stronger equalizing influence against differences in poverty. Federal funds in high poverty districts exceed those in low poverty districts by more than a multiple of four (figure 22). This is not surprising, as the major federal education funding program is poverty driven. However, because these federal allocations are relatively small, overall funding differentials of 27 percent in actual terms ($5,063 versus $6,432) and 29 percent in adjusted terms ($3,951 versus $5,098) between high and low poverty districts remain (figure 21).

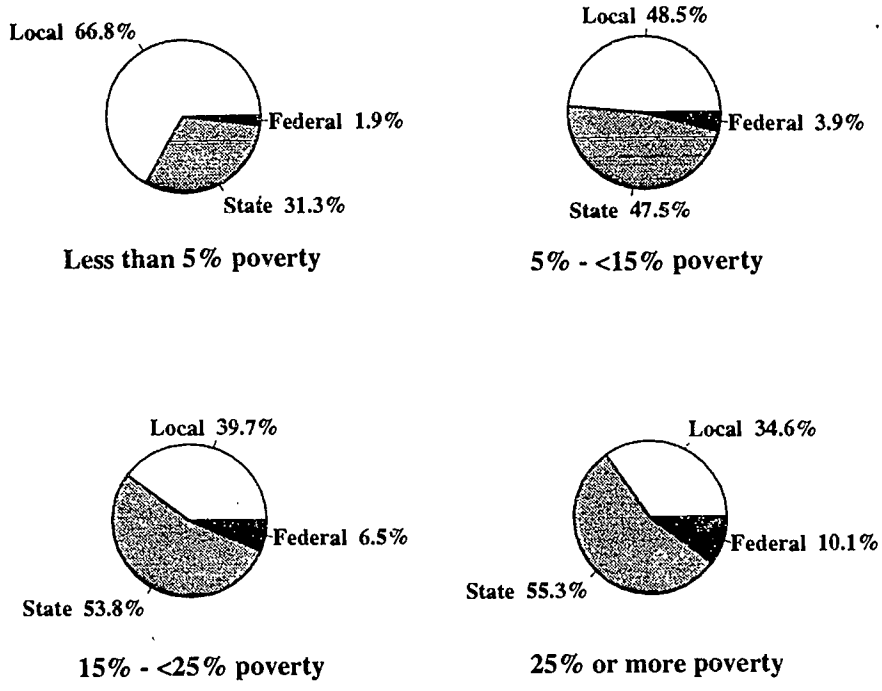
Figure 21.-- Local, state, and federal revenue shares by percentage of school-age children in poverty



	<5%	5%-<15%	15%-<25%	25%+	<5%	5%-<15%	15%-<25%	25%+
Federal	$122	$197	$304	$511	$97	$165	$257	$399
State	$2,013	$2,398	$2,518	$2,800	$1,596	$2,009	$2,128	$2,185
Local	$4,297	$2,448	$1,858	$1,752	$3,405	$2,051	$1,570	$1,367

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

Figure 22.-- Actual local, state, and federal revenue shares by percentage of school-age children in poverty

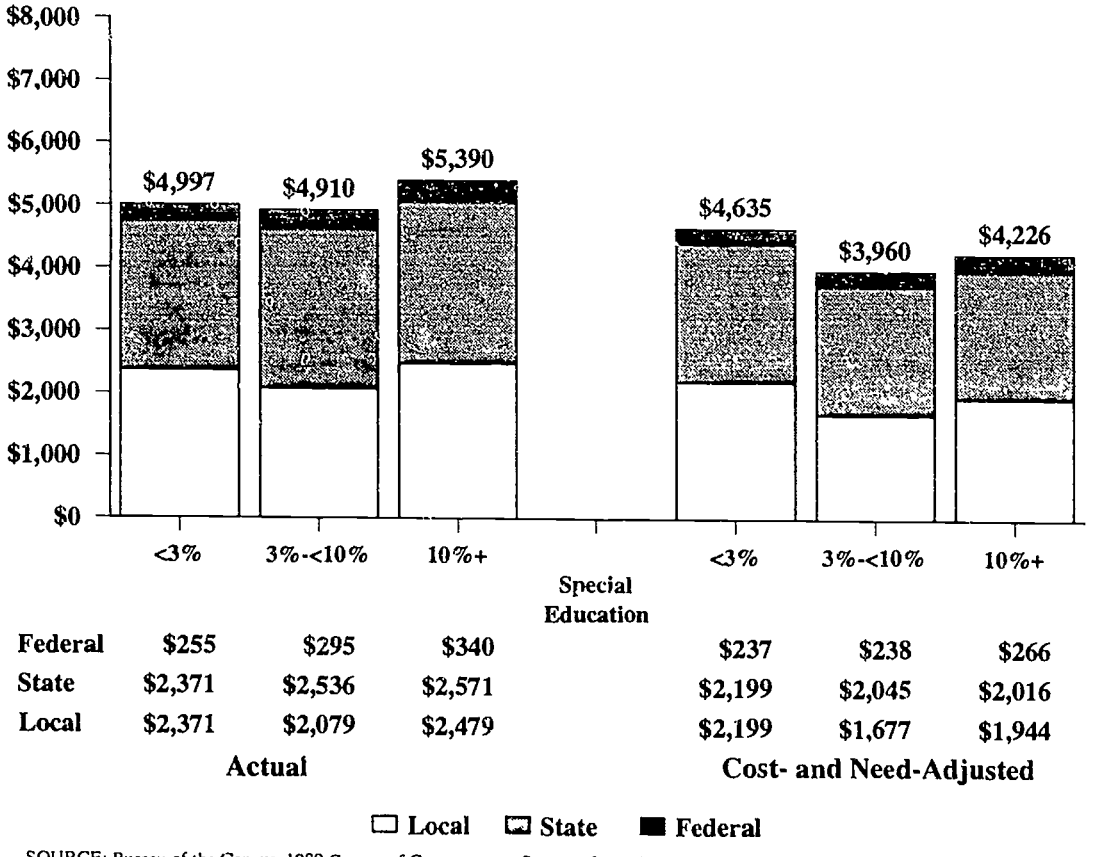


SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

Although local revenues provide two-thirds of the total support received in low poverty districts, local revenues constitute about only one-third of total funding in high poverty districts (see figure 22). As poverty increases, the state funding share rises from 31.3 to 55.3 percent, while federal funding jumps from less than 1.9 percent to 10.1 percent.

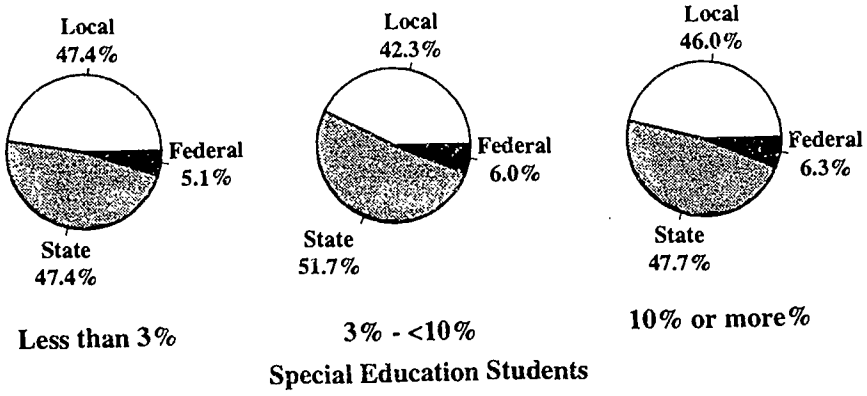
Special education students. Although average state dollars per student are somewhat higher in districts with high percentages of special education students, the opposite occurs in adjusted terms (figure 23). Since all of the states have supplemental funding programs for special education students, a positive relationship between percentage special education and state revenues is not surprising. The fact that this trend is reversed in adjusted terms, however, suggests that these supplemental state funds may not be sufficient to offset the supplemental costs of these services. State funds do not fully compensate the need ratio of 2.3 for special education students used in this study.

Figure 23.-- Local, state, and federal revenue shares by percentage of special education students



SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

Figure 24.-- Actual local, state, and federal revenue shares by percentage of special education students

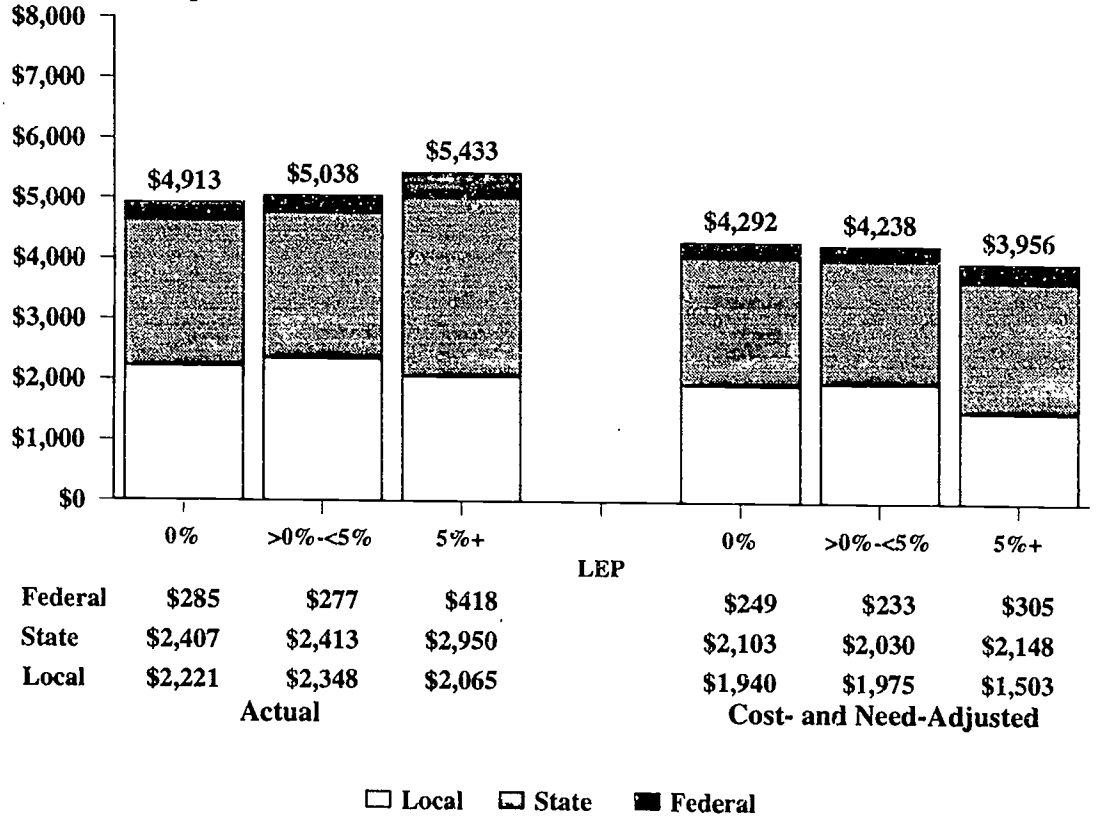


SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data.
NOTE: All results are weighted by district enrollment.

Of course, the federal government also has a program designed to assist with supplemental special education costs. Although federal special education funds are less than the amount of state dollars set aside for these purposes, this analysis suggests that federal funds may be more responsive to changes in special education student identification rates across districts. This is shown by the fact that in the adjusted analysis, federal dollars per student rise with percentage special education, while state dollars per student decline. The greater responsiveness of federal dollars may be due to the fact that federal special education funding is driven solely by the identification rate, while most state formulas are affected by such other factors as the degree of severity associated with the students' conditions. Because the number of severely disabled students may not increase proportionately with overall increases in the percentage of identified students, state formulas may be less sensitive to fluctuation in overall counts of students with disabilities.

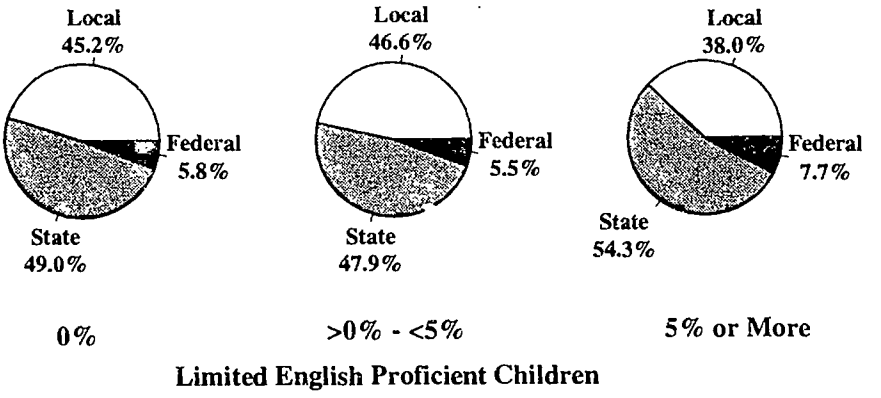
Limited English proficient (LEP) children. As shown in figures 25 and 26, districts with the highest percentages of LEP students receive somewhat lower levels of local revenues and somewhat higher levels of state revenues. In most cases, however, large revenue differentials are only shown for the districts enrolling over 5 percent LEP students (21.6 percent of all students are in these districts). The federal revenue differential is larger for these districts than in those with fewer LEP students both in actual and adjusted terms. This trend reflects the federal role of providing supplemental support to students with special learning needs.

Figure 25.-- Local, state, and federal revenue shares by percentage of limited English proficient children



SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

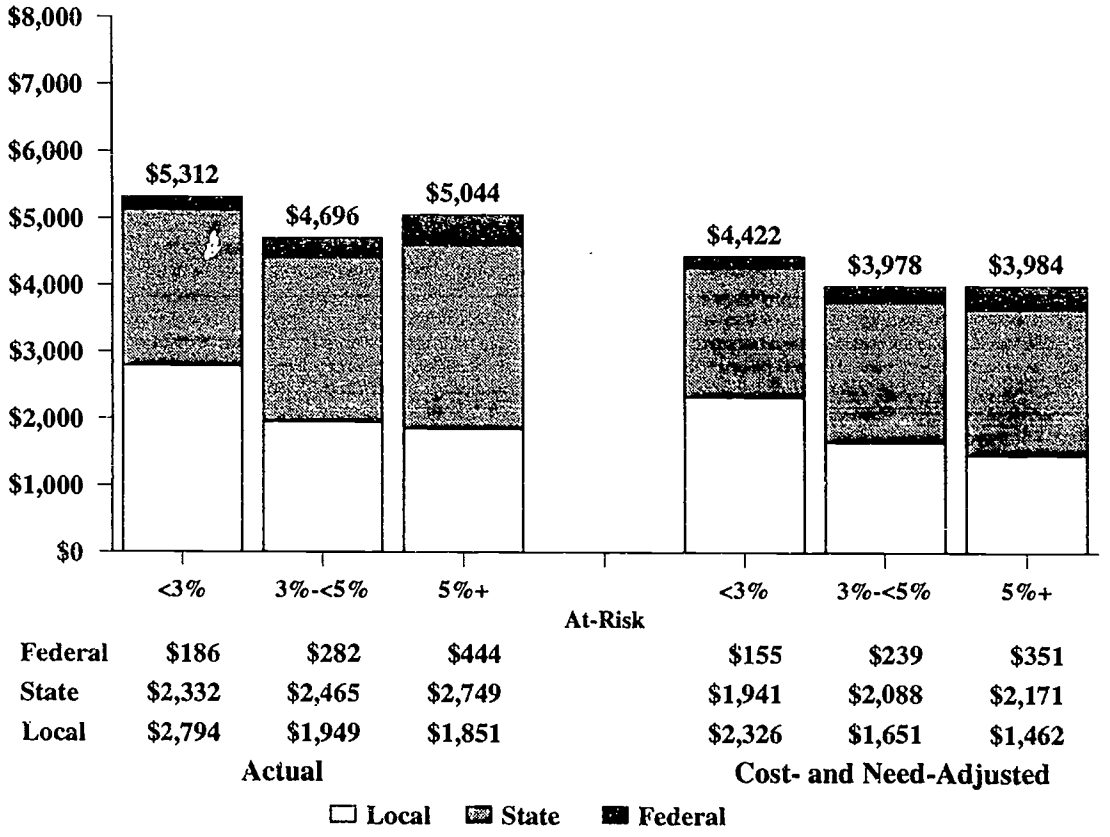
Figure 26.-- Actual local, state, and federal revenue shares by percentage of limited English proficient children



SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances: U.S. Department of Education, National Center for Education Statistics, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

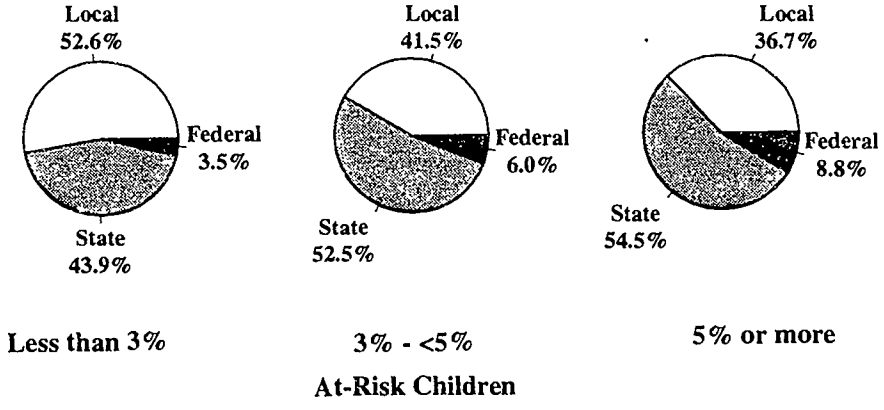
School-age at-risk children. Similar to the situation in districts serving students in poverty, local revenues are lower and state and federal revenues are higher in districts with larger percentages of students at risk (figures 27 and 28). Federal dollars are more than twice as plentiful in districts with the highest percentages of students at risk as compared to districts with the lowest percentages of at-risk students ($444 versus $186 in actual dollars). State dollars are 17.9 percent more in actual terms and 11.8 percent greater in adjusted dollars.

Figure 27.-- Local, state, and federal revenue shares by percentage of school-age at-risk children



SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

Figure 28.-- **Actual local, state, and federal revenue shares by percentage of school-age at-risk children**

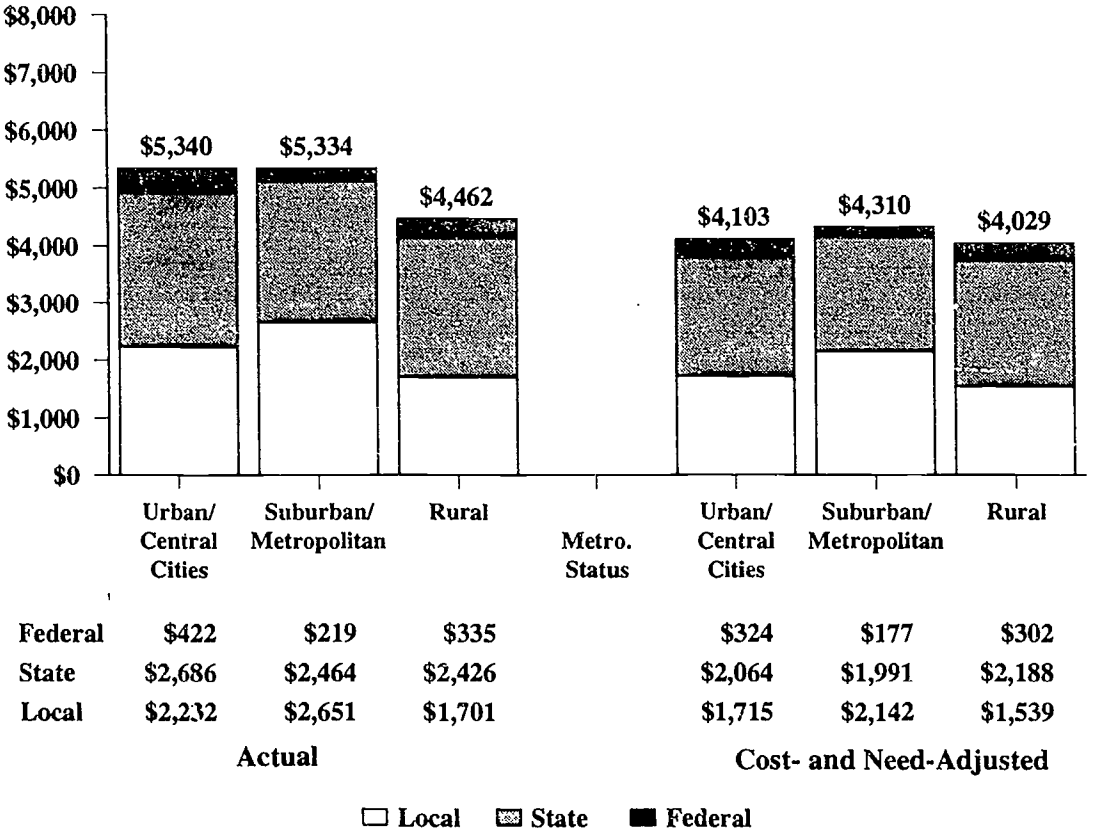


SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

Detailed findings by community characteristics.

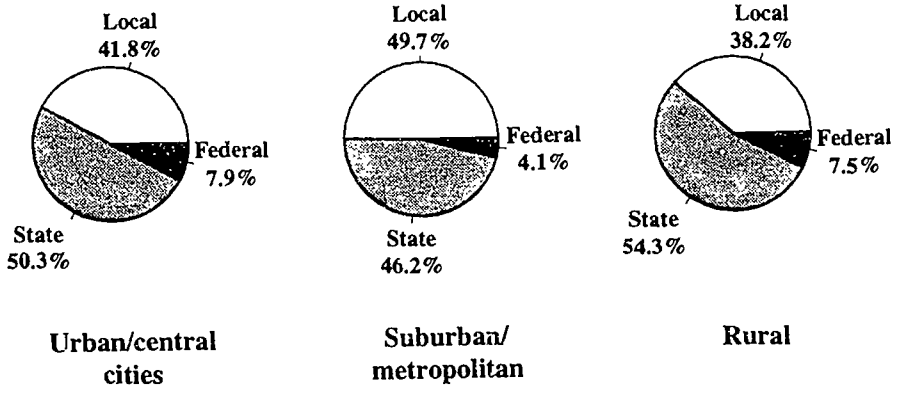
Metropolitan status. In percentage terms, suburban districts receive more support from local sources than other districts, while rural districts receive more support from state sources and urban districts receive more federal support than other districts. The rural districts are also fairly large recipients of federal funds in relation to their suburban counterparts. While the suburban districts receive somewhat less state and federal funds, in adjusted dollars, they more than make up for it through local resource differentials. Overall, the suburban districts receive the greatest levels of adjusted revenues, while the urban districts receive the most when viewed in terms of actual dollars. (See figures 29 and 30.)

Figure 29.-- Local, state, and federal revenue shares by metropolitan status



SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U. S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

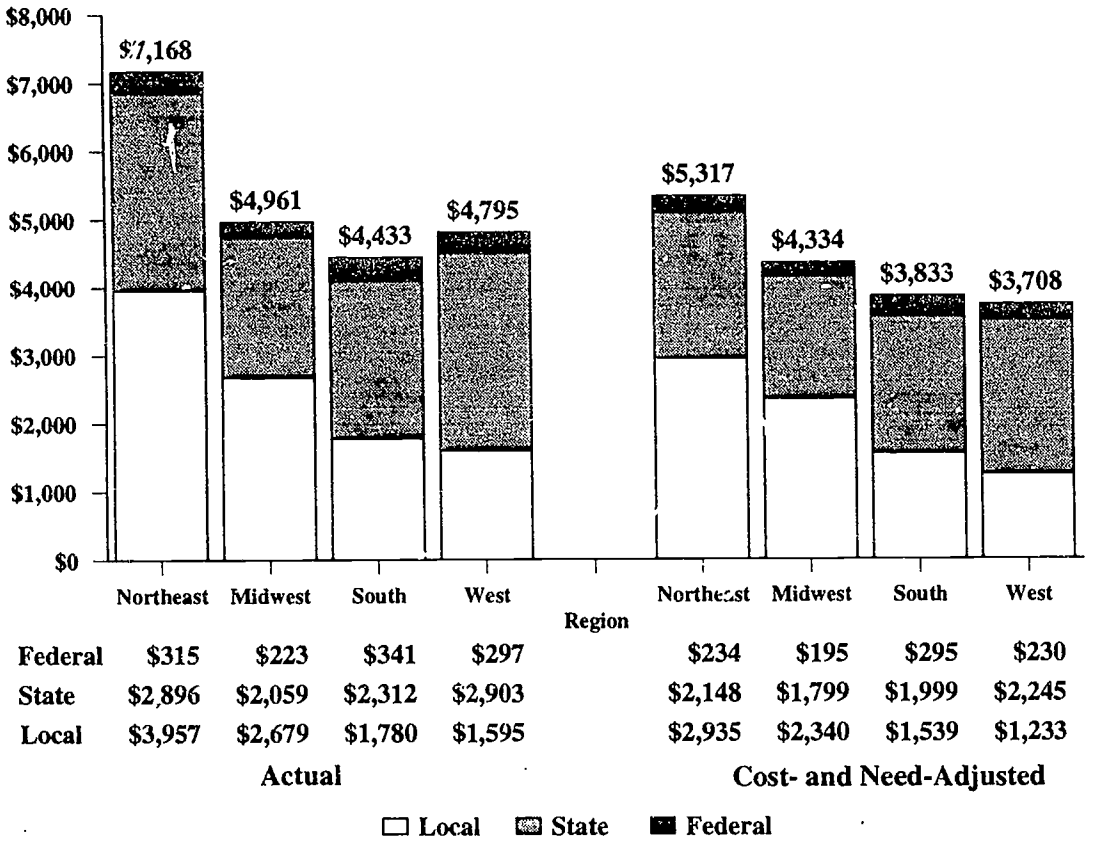
Figure 30.-- Actual local, state, and federal revenue shares by metropolitan status



SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data.
NOTE: All results are weighted by district enrollment.

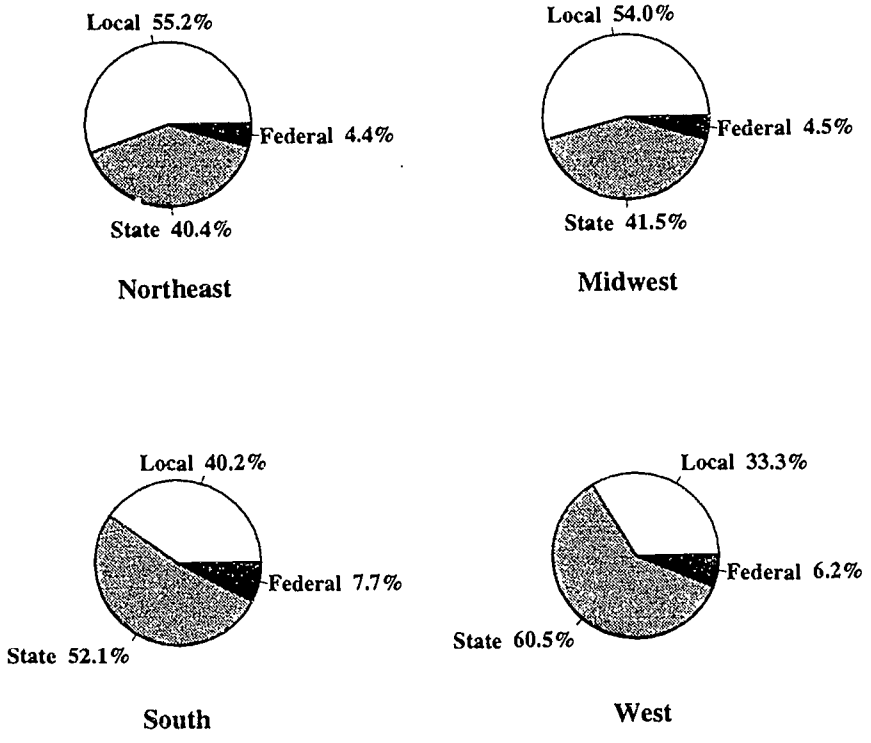
Geographic region. As overall revenues differ so greatly across the four regions of the country (revenues in the Northeast exceeding the next most highly funded region by over $2,000 per student in actual dollars and nearly $1,000 in adjusted terms), it is interesting to trace these large differentials by revenue source. As shown in figures 31 and 32, very different patterns of support are observed across the regions. For example, it is interesting to note that the West, with the lowest overall adjusted revenues per student, receives the greatest share of support from state sources.

Figure 31.-- Local, state, and federal revenue shares by geographic region



SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

Figure 32.-- Actual local, state, and federal revenue shares by geographic region

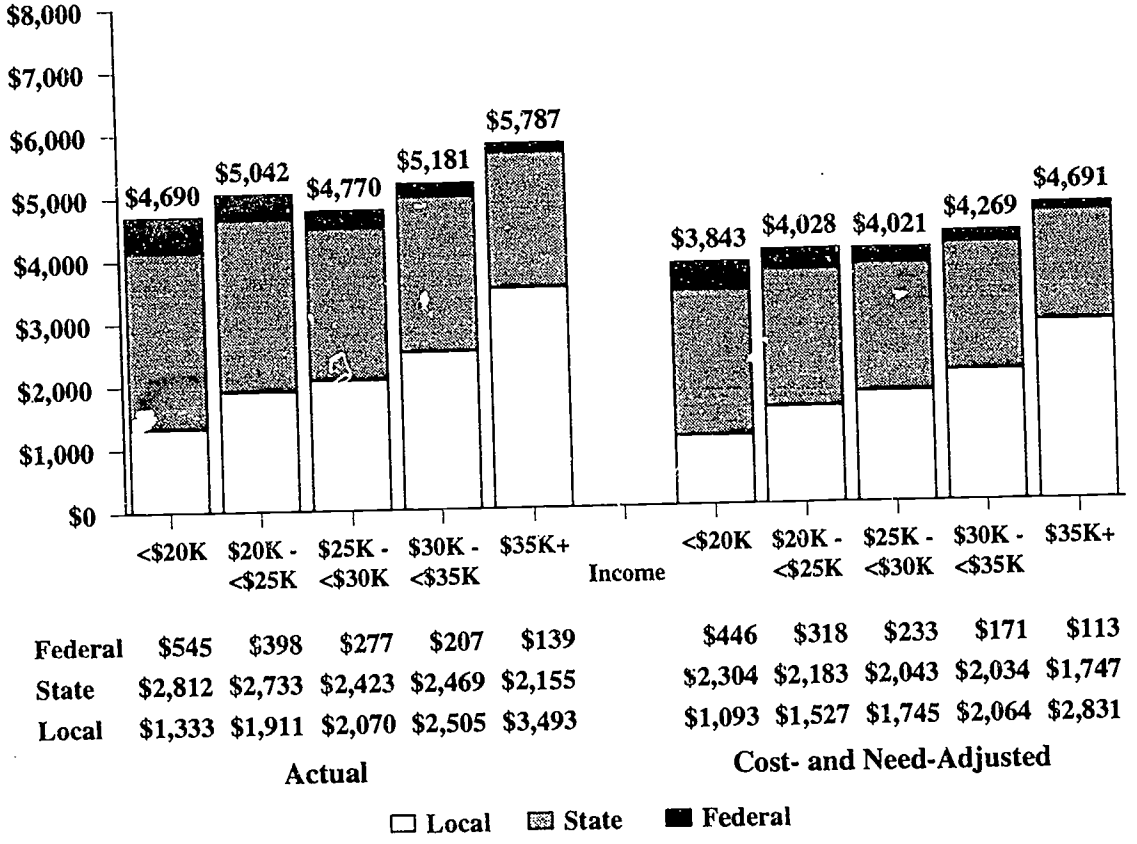


SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances, U.S. Department of Education, National Center for Education Statistics.
NOTE: All results are weighted by district enrollment.

The major source of the overall revenue differential is in the provision of local funds for education. The West and the South fall well behind the Midwest and the Northeast in this regard, with the average local contribution in the West equalling only 42 percent ($1,233 versus $2,935) of the average local contribution in the Northeast in adjusted terms. Thus, while the state contribution in the West appears much larger than for the Northeast in percentage terms (60.5 percent versus 40.4 percent), the dollar differential is really quite small ($2,245 versus $2,148) in adjusted dollars. The South is clearly the largest beneficiary of federal funds for education.

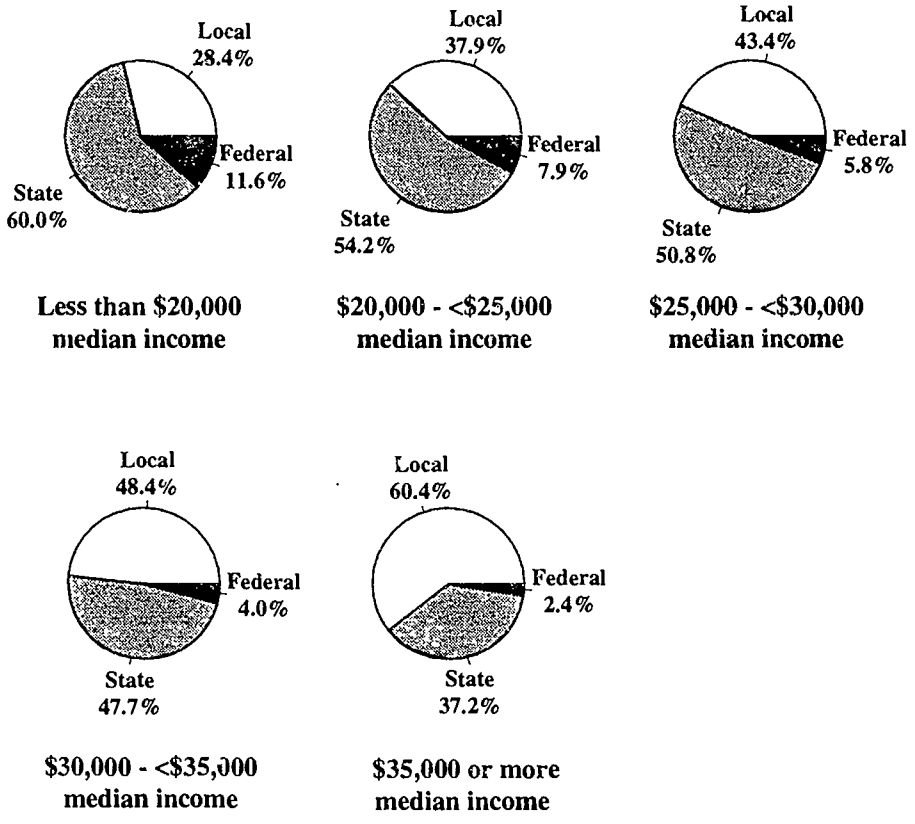
Median household income (cost-adjusted). As shown in figures 33 and 34, while total education revenues across middle income categories do not vary a great deal, a substantial difference is shown between the lowest and highest income categories ($5,787 versus $4, 690). It is also at the extreme income categories that the local revenue differential becomes quite large, with high income communities outspending their lowest income counterparts by more than twofold in both actual and adjusted terms. State aid offsets this with a differential in state dollars between the richest and the poorest districts of over 30 percent in adjusted terms ($1,747 versus $2,304). Once again, federal dollars are heavily weighted in favor of lower income communities, with federal funding nearly quadrupling between the highest and lowest income categories of districts in adjusted terms ($113 versus $446).

Figure 33.-- Local, state, and federal revenue shares by median household income (cost-adjusted)



SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

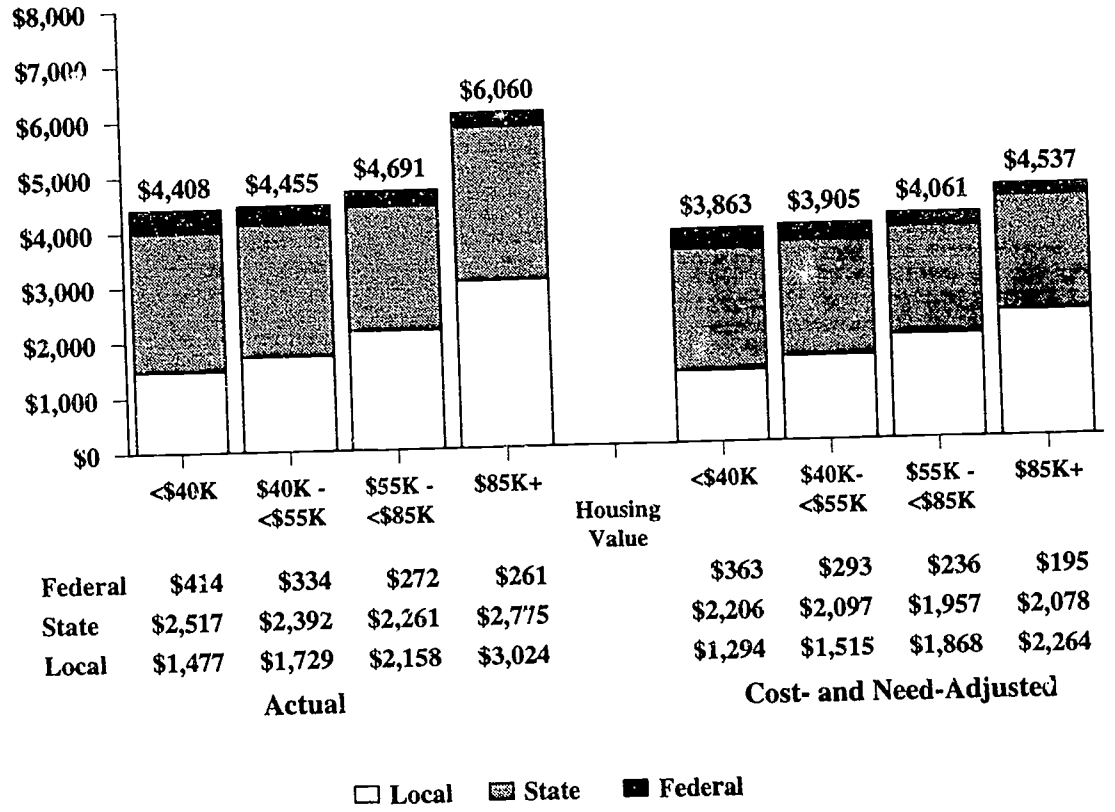
Figure 34.-- Actual local, state, and federal revenue shares by median household income (cost-adjusted)



SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

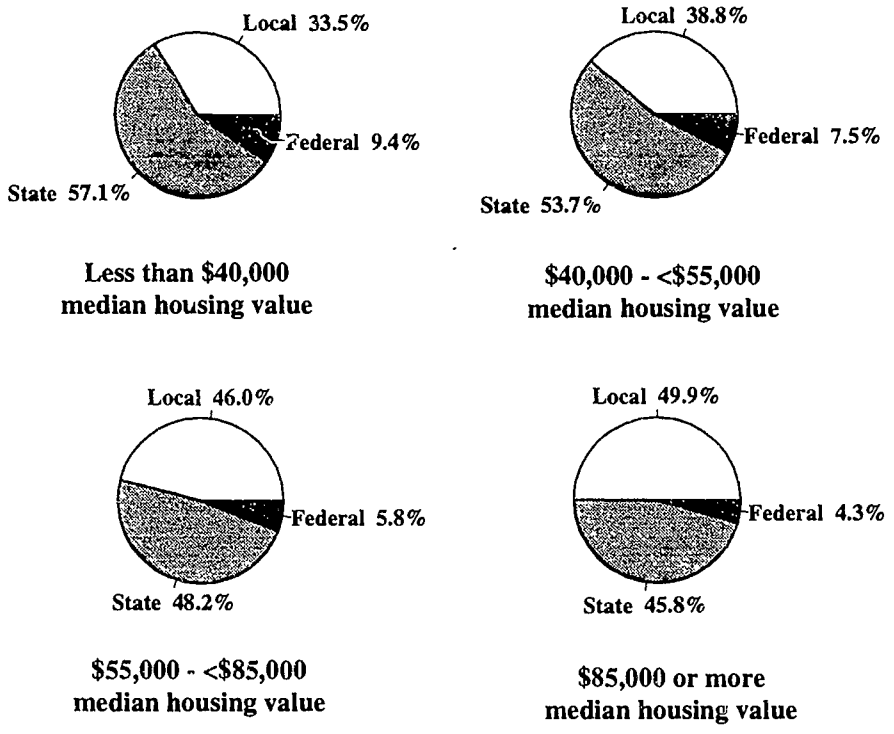
Median value owner-occupied housing. As shown in figures 35 and 36, relatively little wealth equalization in relation to housing values comes from state aid; in adjusted terms, only 6.2 percent more state dollars go to the lowest wealth districts ($2,206 versus $2,078) than to the highest wealth districts. In percentage terms, federal funds show much greater equalizing effects, with federal dollars increasing over 50 percent between the high and low housing value districts.

Figure 35.-- Local, state, and federal revenue shares by median value of owner-occupied housing



SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

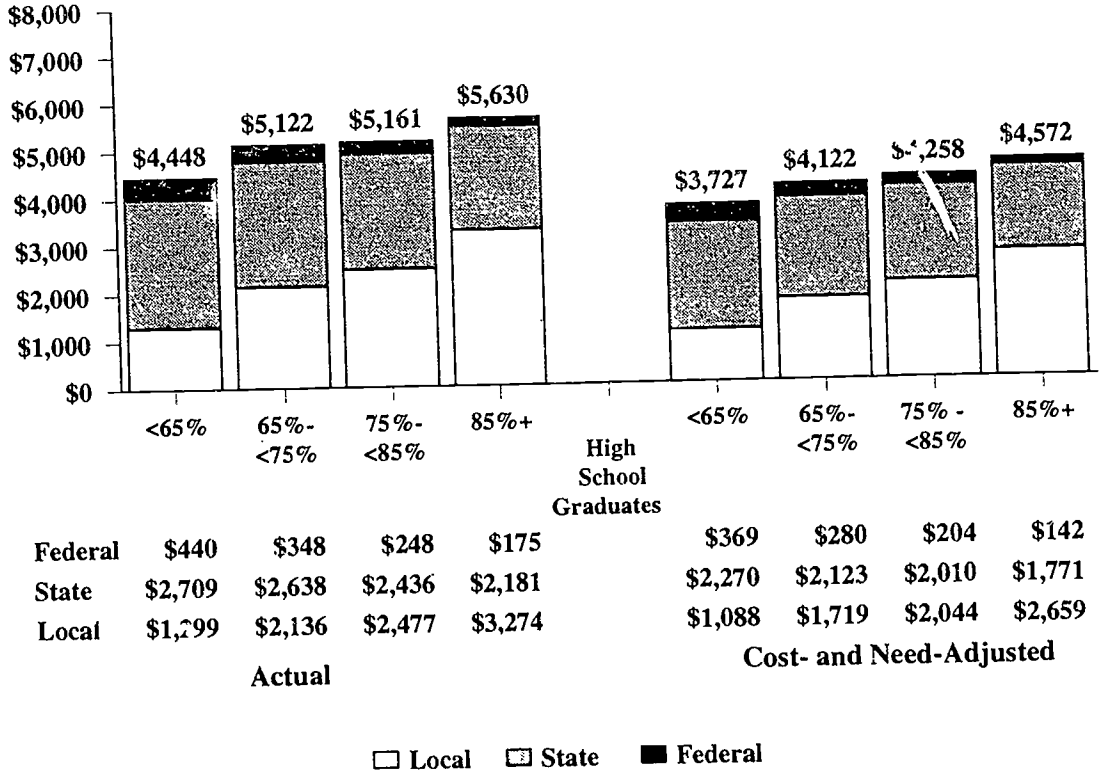
Figure 36.-- Actual local, state, and federal revenue shares by median value owner-occupied housing



SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1990 Census School District Special Tabulation (summary file set 1).
NOTE: All results are weighted by district enrollment.

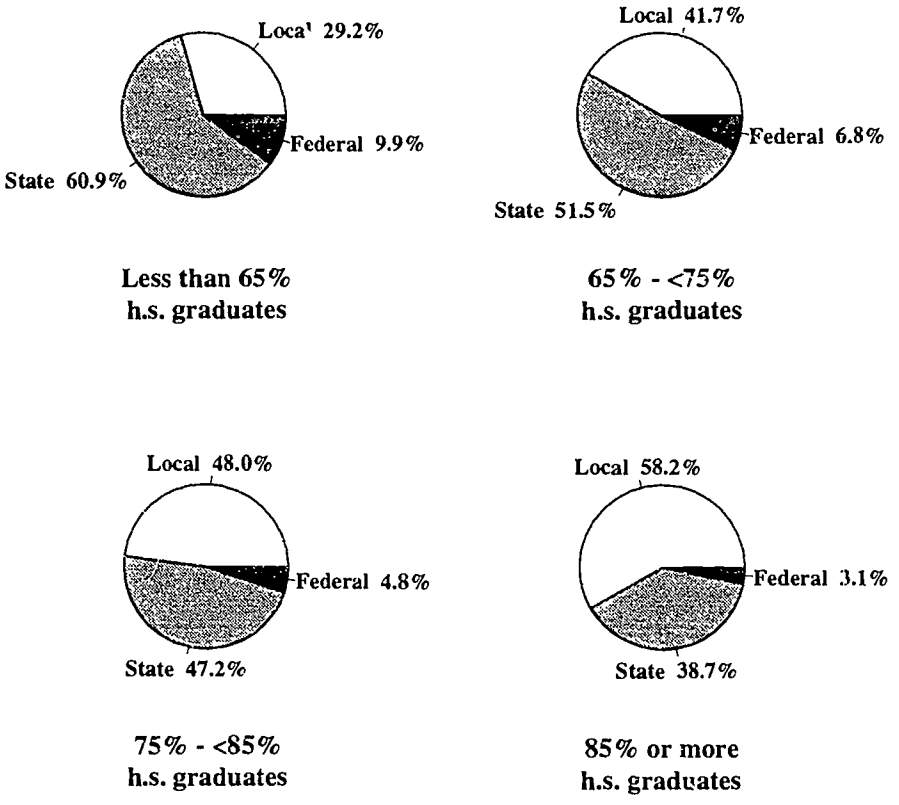
Education attainment of householders. Districts with the lowest average education attainment show the least support from local revenues and the most from state and federal sources in both actual and adjusted terms (figures 37 and 38).

Figure 37.-- Local, state, and federal revenue shares by education attainment of householders



SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

Figure 38.-- Actual local, state, and federal revenue shares by education attainment of householders



SOURCE: Bureau of the Census 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1990 Census School District Special Tabulation (summary file set 1).
NOTE: All results are weighted by district enrollment.

To What Extent Do Education Resource Measures Vary Across the Nation?

Perhaps the primary social commodity guaranteed to the nation's children is their right to a free public education. Because of this, and because of education's strong association with opportunities throughout life, there is a longstanding interest in the fairness with which public education resources are allocated. Since the major responsibility for public education lies with the states, this interest has focused primarily on the degree of variation in average expenditures per student both within and across states. States in which the average education expenditure is similar

in all districts are considered to have more equitable allocation systems than states with large district-to-district expenditure variations. To what degree is there similarity in education expenditure patterns across the nation?

Summary of findings.

- *Across the nation, the distribution of public education resources is substantially more equalized than wealth as measured in the form of housing values, and somewhat more equalized than variations in household income.*

- *State public education allocation systems are the primary equalizing factors of education resources, with some additional equalization resulting from the various federal funding programs.*

Detailed findings. Broad interest in comparing expenditures has led to questions about how variation in expenditures should be measured. Six alternative measures of dispersion are commonly used in conducting equity analyses (Berne and Stiefel 1984). (See Appendix D for discussion of these measures and their utility.) For the following discussion, the degree of difference in resources is measured by the federal range ratio and the coefficient of variation. As opposed to the range, the federal range ratio is less influenced by extreme outlyers. It indicates how many times greater the resources are at the high end of the distribution than at the low end. In contrast to range measures, the coefficient of variation takes into account all observations. It is a measure of the standard deviation expressed as a percentage of the mean. It is also a measure of dispersion with larger numbers meaning greater dispersion (less equity) and smaller numbers meaning less dispersion (greater equity).

Education equity can be measured in terms of horizontal and vertical equity. Horizontal equity assumes that all students should receive equal resources. Measures of dispersion that employ this principal are found in tables 30 and 31 on the "actual" rows. On the other hand, under

the vertical equity principal (which calls for students with varying levels of identifiable education needs to systematically receive varying levels of education resources), differences in education resources between districts are expected when one district enrolls a larger percentage of special needs students (e.g., special education, LEP, or at-risk) than another. A vertical equity standard reflects the belief that supplemental education resources are necessary to meet the special or additional needs of these students. The vertical equity principal is reflected in the student-need adjustments included in the "cost- and need-adjusted" rows of tables 30 and 31. Overall, these rows show differences in district "buying power" in relation to varying resource costs and student needs as opposed to the actual, or nominal, dollar amounts.

The strong equalizing influence of state revenues is shown by the decline in variation observed when state revenues are added to local revenues (table 30). Although local revenues alone show a coefficient of variation of 69.0, this figure drops to 32.8 when state revenues are added. These measures show that disparities in public school district spending are substantially reduced through the addition of state public education funds. Beyond this, federal revenues continue this equalizing pattern, although not to a great degree (with a coefficient of variation for total revenues of 31.4). These findings hold for the actual (horizontal equity) and the adjusted (vertical equity) rows of table 30.

This finding shows that state resource allocation systems make a substantial contribution to the overall equalization of revenues across districts. The relatively small additional federal contribution to overall equalization is not surprising, as this has never been a specific federal goal. Rather than overall equalization, federal funding programs are intended to support services for specific categorical populations of students.

Table 30.-- Measures of dispersion for actual and adjusted local, local and state, and total revenues

	Federal Range Ratio	Coefficient of Variation
Local Revenues		
Actual	8.0	69.0
Cost- and student-need-adjusted	7.5	64.5
Local and State Revenues		
Actual	1.7	32.8
Cost- and student-need-adjusted	1.3	28.0
Total Revenues		
Actual	1.5	31.4
Cost- and student-need-adjusted	1.2	26.2

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances, U.S. Department of Education, National Center for Education Statistics, 1989-1990 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

Another finding from this study is that less variation is found in student/teacher ratios than in expenditure levels (table 31). This shows that access to classroom teachers is less disparate than indicated by measures of overall education expenditures.

Public education resources are more equally allocated across the country than income or wealth (housing values). However, as highlighted in table 32, total education expenditures are only slightly more equalized than distributions of income. Both of these measures are distributed substantially more evenly than housing values. When variations in student/teacher ratios, rather than total education expenditures, are compared to income and housing values, this core education resource measure is distributed much more evenly than either of these two measures of wealth.

Table 31.-- Measures of dispersion for actual and adjusted total, current operating, and core instructional expenditures, and student/teacher ratios

	Federal Range Ratio	Coefficient of Variation
Total Expenditures		
Actual	1.6	31.6
Cost- and student-need-adjusted	1.3	26.9
Current Operating Expenditures		
Actual	1.5	31.0
Cost- and student-need-adjusted	1.2	25.0
Core Instructional Expenditures		
Actual	1.7	31.5
Cost- and student-need-adjusted	1.2	24.5
Student/Teacher ratios		
Actual	0.9	18.3
Student-need-adjusted	0.9	19.1

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-1990 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

Table 32.-- Measures of dispersion for actual and adjusted total expenditures and wealth measures

	Federal Range Ratio	Coefficient of Variation
Total Expenditures		
Actual	1.6	31.6
Cost- and student-need-adjusted	1.3	26.9
Median Household Income (actual)	1.9	34.4
Median Value Owner-Occupied Housing	5.7	69.6

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-1990 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment.

Summary of Findings

Four important policy questions that relate to the financing of public education have been addressed in this report. A summary of the findings for each follows.

How do education resource measures, such as total expenditures per student, vary in different types of school districts and communities across the nation? There is a positive relationship between expenditures and wealth whether wealth is measured by the percentage of children in poverty, household income, or housing values. However, this relationship is only consistently observed across all of the categories of housing values. For the other two wealth variables, higher expenditures are only found for the highest income and the lowest poverty districts. The general inverse relationship between expenditures and wealth is offset by findings relating to other socioeconomic variables relating to equity. For example, no clear expenditure differentials are found for limited English proficient and at-risk students, and a positive relationship is found between expenditures and the percentage of minority students. It is also important to note that expenditure differentials are only shown for districts enrolling the lowest percentages of students in poverty (less than 5 percent), and that these districts only serve about 11 percent of all public school children. Expenditures are relatively equal across other poverty categories within districts.

How do school districts serving different types of students and communities allocate resources across the categories of instruction, administration, and capital outlay? Capital outlay is the area of expenditure found to be the most sensitive to variations in total district spending. Districts with less to spend tend to focus on direct instruction and administration at the expense of capital expenditures. Districts serving relatively high percentages of students in poverty, who are minority, or with limited English proficiency allocate greater percentages of their funds for core instructional purposes than do districts serving lower percentages of these same groups of students. By region, districts in the northeastern section of the country spend more than

the other three regions (the Midwest, the South, and the West), and districts in the West spend appreciably less. For example, in the area of administration and support, districts in the Northeast outspend the West by 65 percent.

How do local, state, and federal revenues vary for school districts serving different types of students and communities? The amount of local support for public education rises with the wealth and socioeconomic condition of the community. State funding sources exhibit a strong equalizing effect on the overall distribution of revenues across districts. Although state and federal allocations are larger in districts with large numbers of special, compensatory, and limited English proficient students, based on the student-need adjustments used in this study, these supplemental funds may be insufficient to offset the costs of the additional programs required to offset the additional needs of these students.

To what extent do education resource measures vary across the nation? The distribution of public education resources is substantially more equal than overall measures of wealth in the form of housing values, and somewhat less varied than wealth in terms of household income. This equalization comes primarily through the influence of state allocation systems with some additional equalization resulting from the various federal funding programs.

In conclusion, the data compiled for this report have provided a first opportunity to examine critical relationships in education fiscal policy, such as real levels of education resources and student poverty across the school districts of the nation. Based on this information, what can be said about public school district spending in America?

Students in public schools across the nation do not always receive comparable quantities of education resources, and in some cases districts enrolling students with the lowest relative levels of special needs appear to receive the most in the way of education resources (i.e., students in districts with the lowest percentages of students in poverty or in special education programs.) Furthermore, this relationship between expenditures and wealth holds whether wealth is measured

in terms of children in poverty, household income, or housing values. On the other hand, only the students in the lowest poverty schools receive substantially more education resources, and independent of other district and community variations, a positive relationship is shown between the percentage of minority students and education expenditures.

State funding systems provide by far the greatest equalizing influence in education expenditures across America, with federal funding also contributing somewhat to equalization. Overall, education expenditures appear to have an equalizing influence across the nation, varying substantially less than housing values and somewhat less than average income.

Core instructional expenditures are least affected by expenditure differentials across districts. Rather, there appears to be a pronounced trend for districts with less to spend to cut back on capital expenditures. Districts in the Northeast spend appreciably more than other regions of the country, and districts in the West spend the least.

Implications for Further Research

In addition to equity issues, the findings discussed in this report also pertain to concerns about the overall adequacy, or sufficiency, of public education resources throughout the nation. Because no absolute standards of educational adequacy have been developed, this concept can only be assessed in comparative terms. The results obtained through multiple regression demonstrate that school district spending substantially varies by geographic region, as does student/teacher ratio. This substantial difference in education funding by region may be a matter of concern. One of the many factors that may be driving this differential between the relatively high spending states of the Northeast and Midwest, as compared to those of the West and South, is the relative reliance on local funding sources. In an effort to obtain funding systems that are more equalized intrastate, some states have elected to emphasize state, rather than local, funding sources. These systems tend to be more equalizing because they rely less on the ability to raise local funds. Local revenues for public education in the western states are substantially lower than those raised in the Northeast, and are accompanied by a $1,661 per student total expenditure difference between these two regions. The 17.7 student/teacher ratio in the Northeast is also substantially lower than the 25.1 ratio in the West. Whatever the cause, the implications of the differences in school district spending between geographic regions need to be thoroughly explored by the school finance research community.

Two findings of this study run somewhat counter to initial expectations. First, spending by school district size is higher only for those school districts with under 1,000 enrollment, other factors being equal. This seems to suggest that the expected diseconomies of small scale only hold for the nation's smallest school districts, a finding that may elicit further study. The fact that this variation is more pronounced in the multivariate analysis suggests that differences in district size may underlie other observed relationships, such as that between metropolitan status and expenditures. Although about one-half (52.2 percent) of the school districts in the country fit into the classification of school districts with under 1,000 enrollment, they serve only 7.1 percent of the nation's public school children.

A second, somewhat surprising, finding is that more money is spent in districts with the highest percentages of minority students compared to districts with the lowest percentages of minority students ($4,514 versus $3,920), holding other school district characteristics constant. This suggests that other influential school district characteristics, such as low property wealth, are associated with lower school district spending, which is sometimes thought to be a by-product of racial composition. The multivariate analysis shows that among school districts with the same geographic location, size, wealth, and student need characteristics, spending is actually higher in districts with high percentages of minority students. This is a somewhat unexpected and encouraging finding, and should be further explored in future studies by school finance researchers.

A less surprising finding is that greater total expenditures per student are associated with higher community socioeconomic status, measured by the value of owner-occupied housing (per student expenditures of $4,401 versus $3,992, other factors held constant), or by education attainment ($4,515 versus $3,953). Unlike the findings for school district size, these results suggest a linear relationship; that is, each increment in socioeconomic status results in higher expenditures. Differences in student/teacher ratios also appear but are less than 1.5 students per teacher. Of interest are the relatively modest dollar differences that occur between socioeconomic groups, compared to the large differences caused by geographic region.

When socioeconomic status is measured by cost-adjusted median household income, however, and all other factors are held constant, the expenditures per student between the highest and lowest income groups differ by only $186 ($4,382 versus $4,196). These findings relating alternative measures of socioeconomic status to education spending provide a fertile field for further research.

Public education total expenditures per student are highest in low poverty districts, but unlike socioeconomic status, the relationship is not linear. Controlling for other factors, the differential between the highest and lowest poverty districts is $309 per student ($4,219 versus

$4,528). However, while school districts with 5 to 15 percent school-age children in poverty spend $4,227, those with 25 percent or more in poverty spend $4,219, a difference of only $8. For most school districts, those with more than 5 percent of school-age children in poverty, per student spending is comparable. Controlling for other school district characteristics, only school districts in the category with the fewest children in poverty spend substantially more per student. Unlike previous studies, we do not find that spending rises with higher percentages of school-age children in poverty.[8]

It is also worthy of note that smaller dollar differences in per student expenditures are observed when core instructional, as opposed to total, expenditures are examined by socioeconomic status (see table A11 in Appendix A). Whether socioeconomic status is measured by the value of owner-occupied housing ($2,669 versus $2,518), by education attainment ($2,700 versus $2,470), or by median household income ($2,701 versus $2,513), other factors held constant, the observed differences in expenditure decrease to $151, $230, and $188, respectively. Core instructional expenditures is a term designed to reflect the central purpose of the local education agency, which is to educate children. Similarly, controlling for other school district characteristics, core expenditures per student for school districts with high and low concentrations of school-age children in poverty differ by only $113 ($2,592 versus $2,705).

These findings suggest that lower wealth districts appear to be investing a larger percentage of their spending on core instructional expenditures, rather than on other areas of their budgets. Although such findings mitigate total expenditure per student spending differences found by

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[8] These findings differ from earlier analyses of the relationship between education expenditures and poverty conducted by Schwartz and Moskowitz (1988). Their state-by-state analyses reported 3 states with negative correlations, 14 states near zero, and 33 states with a positive relationship between these two variables. To further test our findings, which are based on more current data and evaluate this relationship on a national basis, we ran analyses dividing the districts into exact poverty quartiles. We also ran a straight correlation between the various measures of education spending used in this report and the percentage of school-age children in poverty. In each case we found a negative relationship between spending and poverty. Further analyses would be required to determine whether these contradictory findings represent a change over time (the Schwartz and Moskowitz poverty data are from 1979, while the data used in this report are from the 1990 census) or represent differences in the unit of analysis or in the methodological approach.

socioeconomic status, these findings may also indicate that poor school districts are deferring needed school construction and renovation and the purchase of instructional equipment. Other evidence exists to suggest that this is precisely what is occurring. For example, a survey conducted by the American Association of School Administrators in 1991 found 12 percent of the buildings in the country to be inadequate and estimates costs of $100 billion to remedy these deferred maintenance needs. The current study was not able to completely explore the differences in spending for capital outlay, which includes both school construction and the purchase of instructional and other equipment. This also provides an opportunity for further research.

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Appendix A

Bivariate, Dispersion, and Multivariate Tables (Weighted by Student Enrollment)

NOTE: The first eight tables in this appendix present the bivariate results. Because these analyses can be interpreted one page at a time, the two pages that comprise each of these tables are labelled separately (i.e., tables A1.1 and A1.2). The remaining tables, 9 through 12, present the multivariate analyses. Because these analyses explore interrelationships among sets of variables, the pages of these tables are labelled as table A9 and table A9 (continued).

Table A1.1.-- Actual and adjusted total revenues per student by district characteristics

District Characteristics	Percentage of Enrollment	Total Revenues per Student			
		Actual	Cost-Adjusted	Need-Adjusted	Cost- & Need-Adjusted
TOTAL (N=40,079,318)		$5,112	$4,808	$4,445	$4,182
District Enrollment					
0 - 999	7.1	5,308	5,312	4,632	4,631
1,000 - 4,999	30.9	5,089	4,848	4,498	4,283
5,000 - 9,999	16.2	5,055	4,729	4,428	4,141
10,000 or more	45.8	5,118	4,730	4,387	4,058
District Type					
Elementary	0.9	5,817	5,080	5,008	4,364
Secondary	2.2	6,634	5,752	5,952	5,156
Unified	97.0	5,072	4,785	4,407	4,159
School-Age Children in Poverty					
Less than 5%	11.3	6,432	5,624	5,822	5,098
5% - <15%	36.0	5,048	4,788	4,457	4,229
15% - <25%	26.3	4,681	4,592	4,030	3,955
25% or more	26.4	5,064	4,702	4,254	3,952
Special Education Students					
Less than 3%	17.3	5,003	4,831	4,806	4,640
3% - <10%	44.2	4,914	4,533	4,299	3,964
10% or more	38.5	5,389	5,114	4,451	4,227
Limited English Proficient Children					
0%	9.3	4,913	4,878	4,327	4,292
>0% - <5%	69.0	5,038	4,835	4,419	4,238
5% or more	21.6	5,433	4,691	4,581	3,956
Minority Enrollment					
Less than 5%	21.9	4,966	4,867	4,410	4,321
5% - <20%	26.4	5,097	4,845	4,515	4,289
20% - <50%	25.6	4,981	4,750	4,315	4,113
50% or more	26.1	5,378	4,778	4,532	4,025
School-Age At-Risk Children					
Less than 3%	45.4	5,312	4,973	4,724	4,422
3% - <5%	15.4	4,696	4,576	4,083	3,978
5% or more	39.2	5,044	4,709	4,266	3,984
Expenditures per Student					
Less than $4,000	21.3	3,521	3,650	3,075	3,186
$4,000 - <$6,000	55.6	4,814	4,604	4,191	4,009
$6,000 or more	23.2	7,288	6,360	6,314	5,513

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table A1.2.-- Actual and adjusted total revenues per student by community characteristics

Community Characteristics	Percentage of Enrollment	Total Revenues per Student: Actual	Cost-Adjusted	Need-Adjusted	Cost- & Need-Adjusted
TOTAL (N=40,079,318)		$5,112	$4,808	$4,445	$4,182
Metropolitan Status					
Urban/central cities	26.9	5,340	4,839	4,524	4,104
Suburban/metropolitan	47.3	5,333	4,876	4,713	4,309
Rural	25.7	4,468	4,650	3,872	4,030
Geographic Region					
Northeast	17.3	7,168	6,081	6,253	5,317
Midwest	24.5	4,962	4,875	4,414	4,334
South	36.3	4,429	4,466	3,796	3,829
West	22.0	4,791	4,298	4,131	3,704
Median Household Income (actual)					
Less than $20,000	10.1	4,297	4,411	3,616	3,712
$20,000 - <$25,000	21.3	4,622	4,638	3,985	3,999
$25,000 - <$30,000	25.4	5,107	4,839	4,378	4,158
$30,000 - <$35,000	15.9	5,015	4,677	4,382	4,092
$35,000 or more	27.2	5,862	5,137	5,216	4,576
Median Household Income (cost-adjusted)					
Less than $20,000	10.0	4,695	4,550	3,974	3,847
$20,000 - <$25,000	27.9	5,043	4,722	4,294	4,028
$25,000 - <$30,000	25.9	4,770	4,634	4,140	4,021
$30,000 - <$35,000	15.8	5,176	4,833	4,567	4,265
$35,000 or more	20.5	5,793	5,253	5,174	4,695
Median Value Owner-Occupied Housing					
Less than $40,000	10.8	4,408	4,522	3,765	3,864
$40,000 - <$55,000	20.2	4,455	4,509	3,862	3,905
$55,000 - <$85,000	32.5	4,691	4,649	4,098	4,061
$85,000 or more	36.5	6,060	5,200	5,279	4,537
Education Attainment of Householders					
Less than 65% high school graduates	18.1	4,449	4,373	3,794	3,727
65% - <75% high school graduates	31.3	5,122	4,790	4,400	4,123
75% - <85% high school graduates	31.3	5,161	4,876	4,507	4,258
85% or more high school graduates	19.4	5,635	5,133	5,025	4,577
Population in Poverty					
Less than 5%	15.8	6,257	5,509	5,639	4,970
5% - <15%	47.4	4,894	4,704	4,286	4,121
15% - <25%	29.3	4,995	4,676	4,231	3,966
25% or more	7.4	4,533	4,504	3,767	3,742

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table A2.1.-- Total revenues per student and percentage shares from local, state, and federal sources by district characteristics

District Characteristics	Percentage of Enrollment	Total Revenues per Student	Percent Shares: From Local Sources	Percent Shares: From State Sources	Percent Shares: From Federal Sources
TOTAL (N=40,079,318)		$5,112	44.6	49.4	6.0
District Enrollment					
0 - 999	7.1	5,308	47.2	47.3	5.4
1,000 - 4,999	30.9	5,089	47.1	47.4	5.5
5,000 - 9,999	16.2	5,055	45.0	49.3	5.7
10,000 or more	45.8	5,118	42.4	51.0	6.6
District Type					
Elementary	0.9	5,817	47.1	48.3	4.6
Secondary	2.2	6,634	55.7	41.0	3.3
Unified	97.0	5,072	44.3	49.6	6.1
School-Age Children in Poverty					
Less than 5%	11.3	6,432	66.8	31.3	1.9
5% - <15%	36.0	5,048	48.5	47.5	3.9
15% - <25%	26.3	4,681	39.7	53.8	6.5
25% or more	26.4	5,064	34.6	55.3	10.1
Special Education Students					
Less than 3%	17.3	5,003	47.4	47.4	5.1
3% - <10%	44.2	4,914	42.3	51.6	6.0
10% or more	38.5	5,389	46.0	47.7	6.3
Limited English Proficient Children					
0%	9.3	4,913	45.2	49.0	5.8
>0% - <5%	69.0	5,038	46.6	47.9	5.5
5% or more	21.6	5,433	38.0	54.3	7.7
Minority Enrollment					
Less than 5%	21.9	4,966	49.2	46.7	4.1
5% - <20%	26.4	5,097	50.7	45.2	4.1
20% - <50%	25.6	4,981	43.8	50.1	6.1
50% or more	26.1	5,378	35.4	55.2	9.4
School-Age At-Risk Children					
Less than 3%	45.4	5,312	52.6	43.9	3.5
3% - <5%	15.4	4,696	41.5	52.5	6.0
5% or more	39.2	5,044	36.7	54.5	8.8
Expenditures per Student					
Less than $4,000	21.3	3,521	35.9	56.3	7.8
$4,000 - <$6,000	55.6	4,814	42.4	51.8	5.9
$6,000 or more	23.2	7,288	58.1	37.2	4.7

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table A2.2.-- Total revenues per student and percentage shares from local, state, and federal sources by community characteristics

Community Characteristics	Percentage of Enrollment	Total Revenues per Student	Percent Shares: From Local Sources	Percent Shares: From State Sources	Percent Shares: From Federal Sources
TOTAL (N=40,079,318)		$5,112	44.6	49.4	6.0
Metropolitan Status					
Urban/central cities	26.9	5,340	41.8	50.3	7.9
Suburban/metropolitan	47.3	5,333	49.7	46.2	4.1
Rural	25.7	4,468	38.2	54.3	7.5
Geographic Region					
Northeast	17.3	7,168	55.2	40.4	4.4
Midwest	24.5	4,962	54.0	41.5	4.5
South	36.3	4,429	40.2	52.2	7.7
West	22.0	4,791	33.3	60.6	6.1
Median Household Income (actual)					
Less than $20,000	10.1	4,297	28.2	60.1	11.7
$20,000 - <$25,000	21.3	4,622	38.7	53.7	7.6
$25,000 - <$30,000	25.4	5,107	44.0	49.6	6.4
$30,000 - <$35,000	15.9	5,015	44.1	50.9	4.9
$35,000 or more	27.2	5,862	56.3	40.9	2.8
Median Household Income (cost-adjusted)					
Less than $20,000	10.0	4,695	28.4	59.9	11.6
$20,000 - <$25,000	27.9	5,043	37.9	54.2	7.9
$25,000 - <$30,000	25.9	4,770	43.4	50.8	5.8
$30,000 - <$35,000	15.8	5,176	48.4	47.7	4.0
$35,000 or more	20.5	5,793	60.3	37.2	2.4
Median Value Owner-Occupied Housing					
Less than $40,000	10.8	4,408	33.5	57.1	9.4
$40,000 - <$55,000	20.2	4,455	38.8	53.7	7.5
$55,000 - <$85,000	32.5	4,691	46.0	48.2	5.8
$85,000 or more	36.5	6,060	49.9	45.8	4.3
Education Attainment of Householders					
Less than 65% high school graduates	18.1	4,449	29.2	60.9	9.9
65% - <75% high school graduates	31.3	5,122	41.7	51.5	6.8
75% - <85% high school graduates	31.3	5,161	48.0	47.2	4.8
85% or more high school graduates	19.4	5,635	58.1	38.7	3.1
Population in Poverty					
Less than 5%	15.8	6,257	64.7	33.2	2.1
5% - <15%	47.4	4,894	44.9	50.3	4.8
15% - <25%	29.3	4,995	37.8	53.9	8.3
25% or more	7.4	4,533	27.1	60.1	12.8

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table A3.1.-- Actual and adjusted total expenditures per student by district characteristics

District Characteristics	Percentage of Enrollment	Total Expenditures per Student			
		Actual	Cost-Adjusted	Need-Adjusted	Cost- & Need-Adjusted
TOTAL (N=40,079,318)		$5,196	$4,890	$4,518	$4,253
District Enrollment					
0 - 999	7.1	5,348	5,354	4,662	4,663
1,000 - 4,999	30.9	5,147	4,906	4,550	4,334
5,000 - 9,999	16.2	5,116	4,790	4,481	4,194
10,000 or more	45.8	5,234	4,842	4,488	4,155
District Type					
Elementary	0.9	5,850	5,104	5,034	4,382
Secondary	2.2	6,610	5,735	5,923	5,134
Unified	97.0	5,159	4,869	4,482	4,232
School-Age Children in Poverty					
Less than 5%	11.3	6,565	5,746	5,944	5,209
5% - <15%	36.0	5,120	4,858	4,518	4,289
15% - <25%	26.3	4,736	4,648	4,077	4,003
25% or more	26.4	5,173	4,808	4,348	4,044
Special Education Students					
Less than 3%	17.3	5,061	4,886	4,662	4,692
3% - <10%	44.2	5,030	4,643	4,399	4,060
10% or more	38.5	5,447	5,175	4,501	4,278
Limited English Proficient Children					
0%	9.3	4,962	4,927	4,368	4,333
>0% - <5%	69.0	5,119	4,915	4,490	4,308
5% or more	21.6	5,541	4,794	4,673	4,043
Minority Enrollment					
Less than 5%	21.9	5,043	4,942	4,480	4,389
5% - <20%	26.4	5,169	4,916	4,578	4,350
20% - <50%	25.6	5,071	4,840	4,393	4,190
50% or more	26.1	5,474	4,870	4,613	4,103
School-Age At-Risk Children					
Less than 3%	45.4	5,396	5,053	4,798	4,493
3% - <5%	15.4	4,773	4,653	4,149	4,045
5% or more	39.2	5,131	4,794	4,340	4,057

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table A3.2.-- Actual and adjusted total expenditures per student by community characteristics

Community Characteristics	Percentage of Enrollment	Total Expenditures per Student: Actual	Cost-Adjusted	Need-Adjusted	Cost- & Need-Adjusted
TOTAL (N=40,079,318)		$5,196	$4,890	$4,518	$4,253
Metropolitan Status					
Urban/central cities	26.9	5,447	4,944	4,618	4,195
Suburban/metropolitan	47.3	5,427	4,967	4,796	4,389
Rural	25.7	4,507	4,692	3,904	4,064
Geographic Region					
Northeast	17.3	7,240	6,150	6,321	5,383
Midwest	24.5	4,995	4,905	4,443	4,361
South	36.3	4,567	4,607	3,914	3,948
West	22.0	4,851	4,351	4,183	3,749
Median Household Income (actual)					
Less than $20,000	10.1	4,370	4,491	3,678	3,779
$20,000 - <$25,000	21.3	4,689	4,709	4,043	4,060
$25,000 - <$30,000	25.4	5,162	4,892	4,426	4,204
$30,000 - <$35,000	15.9	5,156	4,810	4,503	4,207
$35,000 or more	27.2	5,957	5,226	5,300	4,655
Median Household Income (cost-adjusted)					
Less than $20,000	10.0	4,744	4,605	4,017	3,894
$20,000 - <$25,000	27.9	5,132	4,807	4,371	4,101
$25,000 - <$30,000	25.9	4,839	4,701	4,198	4,078
$30,000 - <$35,000	15.8	5,260	4,913	4,642	4,337
$35,000 or more	20.5	5,905	5,362	5,274	4,792
Median Value Owner-Occupied Housing					
Less than $40,000	10.8	4,439	4,560	3,791	3,895
$40,000 - <$55,000	20.2	4,504	4,558	3,904	3,947
$55,000 - <$85,000	32.5	4,802	4,759	4,195	4,157
$85,000 or more	36.5	6,155	5,288	5,363	4,615
Education Attainment of Householders					
Less than 65% high school graduates	18.1	4,503	4,432	3,839	3,776
65% - <75% high school graduates	31.3	5,202	4,866	4,469	4,188
75% - <85% high school graduates	31.3	5,244	4,956	4,580	4,328
85% or more high school graduates	19.4	5,754	5,249	5,132	4,681
Population in Poverty					
Less than 5%	15.8	6,366	5,610	5,738	5,062
5% - <15%	47.4	4,965	4,774	4,348	4,182
15% - <25%	29.3	5,086	4,765	4,310	4,043
25% or more	7.4	4,615	4,595	3,836	3,819

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table A4.1.-- Actual and adjusted current operating expenditures per student by district characteristics

District Characteristics	Percentage of Enrollment	Current Operating Expenditures per Student			
		Actual	Cost-Adjusted	Need-Adjusted	Cost- & Need-Adjusted
TOTAL (N=40,079,318)		$4,509	$4,238	$3,919	$3,685
District Enrollment					
0 - 999	7.1	4,531	4,546	3,954	3,962
1,000 - 4,999	30.9	4,483	4,273	3,961	3,773
5,000 - 9,999	16.2	4,489	4,199	3,931	3,676
10,000 or more	45.8	4,529	4,180	3,881	3,586
District Type					
Elementary	0.9	4,554	3,945	3,939	3,404
Secondary	2.2	5,726	4,956	5,132	4,438
Unified	97.0	4,481	4,225	3,892	3,671
School-Age Children in Poverty					
Less than 5%	11.3	5,584	4,870	5,054	4,414
5% - <15%	36.0	4,385	4,156	3,871	3,671
15% - <25%	26.3	4,118	4,042	3,547	3,483
25% or more	26.4	4,607	4,275	3,870	3,594
Special Education Students					
Less than 3%	17.3	4,418	4,272	4,242	4,101
3% - <10%	44.2	4,340	4,001	3,795	3,497
10% or more	38.5	4,743	4,495	3,917	3,715
Limited English Proficient Children					
0%	9.3	4,243	4,222	3,737	3,714
>0% - <5%	69.0	4,428	4,249	3,883	3,724
5% or more	21.6	4,880	4,210	4,112	3,548
Minority Enrollment					
Less than 5%	21.9	4,353	4,268	3,867	3,790
5% - <20%	26.4	4,448	4,228	3,939	3,741
20% - <50%	25.6	4,354	4,153	3,773	3,597
50% or more	26.1	4,851	4,307	4,086	3,627
School-Age At-Risk Children					
Less than 3%	45.4	4,629	4,329	4,115	3,849
3% - <5%	15.4	4,140	4,034	3,600	3,508
5% or more	39.2	4,515	4,212	3,818	3,565

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table A4.2.-- Actual and adjusted current operating expenditures per student by community characteristics

Community Characteristics	Percentage of Enrollment	Current Operating Expenditures per Student			
		Actual	Cost-Adjusted	Need-Adjusted	Cost- & Need-Adjusted
TOTAL (N=40,079,318)		$4,509	$4,238	$3,919	$3,685
Metropolitan Status					
Urban/central cities	26.9	4,825	4,371	4,087	3,706
Suburban/metropolitan	47.3	4,640	4,238	4,101	3,746
Rural	25.7	3,935	4,099	3,410	3,551
Geographic Region					
Northeast	17.3	6,365	5,390	5,548	4,710
Midwest	24.5	4,333	4,256	3,855	3,785
South	36.3	3,928	3,966	3,367	3,399
West	22.0	4,203	3,762	3,622	3,241
Median Household Income (actual)					
Less than $20,000	10.1	3,907	4,013	3,288	3,377
$20,000 - <$25,000	21.3	4,123	4,138	3,555	3,568
$25,000 - <$30,000	25.4	4,523	4,279	3,877	3,677
$30,000 - <$35,000	15.9	4,378	4,072	3,825	3,564
$35,000 or more	27.2	5,099	4,459	4,535	3,970
Median Household Income (cost-adjusted)					
Less than $20,000	10.0	4,244	4,119	3,592	3,483
$20,000 - <$25,000	27.9	4,534	4,240	3,859	3,615
$25,000 - <$30,000	25.9	4,196	4,077	3,643	3,539
$30,000 - <$35,000	15.8	4,486	4,184	3,960	3,694
$35,000 or more	20.5	5,017	4,539	4,480	4,056
Median Value Owner-Occupied Housing					
Less than $40,000	10.8	3,969	4,074	3,389	3,480
$40,000 - <$55,000	20.2	3,999	4,047	3,466	3,504
$55,000 - <$85,000	32.5	4,111	4,074	3,592	3,560
$85,000 or more	36.5	5,306	4,538	4,619	3,957
Education Attainment of Householders					
Less than 65% high school graduates	18.1	4,007	3,944	3,416	3,360
65% - <75% high school graduates	31.3	4,568	4,267	3,922	3,672
75% - <85% high school graduates	31.3	4,524	4,270	3,952	3,730
85% or more high school graduates	19.4	4,855	4,414	4,330	3,936
Population in Poverty					
Less than 5%	15.8	5,443	4,782	4,904	4,314
5% - <15%	47.4	4,265	4,097	3,736	3,591
15% - <25%	29.3	4,498	4,208	3,810	3,569
25% or more	7.4	4,119	4,097	3,425	3,406

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table A5.1.-- Actual and adjusted core instructional expenditures per student by district characteristics

District Characteristics	Percentage of Enrollment	Core Instructional Expenditures per Student			
		Actual	Cost-Adjusted	Need-Adjusted	Cost- & Need-Adjusted
TOTAL (N=40,079,318)		$3,180	$2,981	$2,763	$2,591
District Enrollment					
0 - 999	7.1	3,068	3,075	2,675	2,678
1,000 - 4,999	30.9	3,130	2,981	2,764	2,631
5,000 - 9,999	16.2	3,204	2,990	2,804	2,616
10,000 or more	45.8	3,222	2,964	2,761	2,543
District Type					
Elementary	0.9	3,375	2,918	2,918	2,517
Secondary	2.2	4,172	3,602	3,734	3,221
Unified	97.0	3,156	2,968	2,740	2,578
School-Age Children in Poverty					
Less than 5%	11.3	3,918	3,414	3,543	3,092
5% - <15%	36.0	3,097	2,930	2,733	2,587
15% - <25%	26.3	2,898	2,836	2,496	2,444
25% or more	26.4	3,257	3,012	2,734	2,531
Special Education Students					
Less than 3%	17.3	3,032	2,931	2,911	2,813
3% - <10%	44.2	3,113	2,862	2,721	2,500
10% or more	38.5	3,323	3,142	2,744	2,596
Limited English Proficient Children					
0%	9.3	2,905	2,888	2,557	2,539
>0% - <5%	69.0	3,086	2,959	2,706	2,593
5% or more	21.6	3,597	3,095	3,031	2,608
Minority Enrollment					
Less than 5%	21.9	3,017	2,957	2,678	2,624
5% - <20%	26.4	3,130	2,973	2,770	2,629
20% - <50%	25.6	3,063	2,912	2,656	2,524
50% or more	26.1	3,480	3,079	2,930	2,592
School-Age At-Risk Children					
Less than 3%	45.4	3,258	3,043	2,895	2,704
3% - <5%	15.4	2,924	2,842	2,542	2,470
5% or more	39.2	3,189	2,965	2,697	2,509

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table A5.2.-- Actual and adjusted core instructional expenditures per student by community characteristics

Community Characteristics	Percentage of Enrollment	Core Instructional Expenditures per Student: Actual	Cost-Adjusted	Need-Adjusted	Cost- & Need-Adjusted
TOTAL (N=40,079,318)		$3,180	$2,981	$2,763	$2,591
Metropolitan Status					
Urban/central cities	26.9	3,450	3,115	2,921	2,640
Suburban/metropolitan	47.3	3,272	2,983	2,891	2,636
Rural	25.7	2,726	2,839	2,361	2,459
Geographic Region					
Northeast	17.3	4,522	3,827	3,935	3,339
Midwest	24.5	2,954	2,902	2,626	2,579
South	36.3	2,718	2,745	2,331	2,354
West	22.0	3,137	2,796	2,705	2,410
Median Household Income (actual)					
Less than $20,000	10.1	2,677	2,751	2,253	2,315
$20,000 - <$25,000	21.3	2,876	2,884	2,479	2,485
$25,000 - <$30,000	25.4	3,202	3,021	2,743	2,594
$30,000 - <$35,000	15.9	3,075	2,854	2,686	2,496
$35,000 or more	27.2	3,645	3,182	3,239	2,831
Median Household Income (cost-adjusted)					
Less than $20,000	10.0	2,940	2,851	2,488	2,410
$20,000 - <$25,000	27.9	3,200	2,981	2,722	2,541
$25,000 - <$30,000	25.9	2,960	2,870	2,569	2,490
$30,000 - <$35,000	15.8	3,171	2,950	2,798	2,603
$35,000 or more	20.5	3,554	3,212	3,171	2,868
Median Value Owner-Occupied Housing					
Less than $40,000	10.8	2,714	2,785	2,317	2,378
$40,000 - <$55,000	20.2	2,765	2,799	2,396	2,423
$55,000 - <$85,000	32.5	2,865	2,839	2,503	2,480
$85,000 or more	36.5	3,827	3,268	3,329	2,847
Education Attainment of Householders					
Less than 65% high school graduates	18.1	2,804	2,755	2,390	2,347
65% - <75% high school graduates	31.3	3,217	2,996	2,760	2,576
75% - <85% high school graduates	31.3	3,179	2,992	2,776	2,613
85% or more high school graduates	19.4	3,471	3,151	3,093	2,808
Population in Poverty					
Less than 5%	15.8	3,829	3,361	3,447	3,029
5% - <15%	47.4	3,011	2,886	2,637	2,528
15% - <25%	29.3	3,187	2,972	2,698	2,519
25% or more	7.4	2,842	2,826	2,361	2,348

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table A6.1.-- Cost- and need-adjusted total expenditures per student and percentage shares for current operating and core instructional expenditures by district characteristics

District Characteristics	Percentage of Enrollment	Cost- & Need-Adjusted	Percent Share for Current Expenditures	Percent Share for Core Expenditures	Percent Share of Current Expenditures for Core Expenditures
TOTAL (N=40,079,318)		$4,253	86.6	60.9	70.3
District Enrollment					
0 - 999	7.1	4,663	85.0	57.4	67.6
1,000 - 4,999	30.9	4,334	87.1	60.7	69.7
5,000 - 9,999	16.2	4,194	87.6	62.4	71.2
10,000 or more	45.8	4,155	86.3	61.2	70.9
District Type					
Elementary	0.9	4,382	77.7	57.4	73.9
Secondary	2.2	5,134	86.4	62.7	72.6
Unified	97.0	4,232	86.7	60.9	70.2
School-Age Children in Poverty					
Less than 5%	11.3	5,209	84.7	59.4	70.0
5% - <15%	36.0	4,289	85.6	60.3	70.5
15% - <25%	26.3	4,003	87.0	61.1	70.2
25% or more	26.4	4,044	88.9	62.6	70.4
Special Education Students					
Less than 3%	17.3	4,692	87.4	60.0	68.6
3% - <10%	44.2	4,060	86.1	61.6	71.5
10% or more	38.5	4,278	86.8	60.7	69.9
Limited English Proficient Children					
0%	9.3	4,333	85.7	58.6	68.4
>0% - <5%	69.0	4,308	86.4	60.2	69.6
5% or more	21.6	4,043	87.8	64.5	73.5
Minority Enrollment					
Less than 5%	21.9	4,389	86.4	59.8	69.2
5% - <20%	26.4	4,350	86.0	60.4	70.3
20% - <50%	25.6	4,190	85.8	60.2	70.2
50% or more	26.1	4,103	88.4	63.2	71.5
School-Age At-Risk Children					
Less than 3%	45.4	4,493	85.7	60.2	70.3
3% - <5%	15.4	4,045	86.7	61.1	70.4
5% or more	39.2	4,057	87.9	61.8	70.4

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table A6.2.-- Cost- and need-adjusted total expenditures per student and percentage shares for current operating and core instructional expenditures by community characteristics

Community Characteristics	Percentage of Enrollment	Cost- & Need-Adjusted	Percent Share for Current Expenditures	Percent Share for Core Expenditures	Percent Share of Current Expenditures for Core Expenditures
TOTAL (N=40,079,318)		$4,253	86.6	60.9	70.3
Metropolitan Status					
Urban/central cities	26.9	4,195	88.3	62.9	71.2
Suburban/metropolitan	47.3	4,389	85.3	60.1	70.4
Rural	25.7	4,064	87.4	60.5	69.2
Geographic Region					
Northeast	17.3	5,383	87.5	62.0	70.9
Midwest	24.5	4,361	86.8	59.1	68.1
South	36.3	3,948	86.1	59.6	69.3
West	22.0	3,749	86.4	64.3	74.4
Median Household Income (actual)					
Less than $20,000	10.1	3,779	89.4	61.3	68.6
$20,000 - <$25,000	21.3	4,060	87.9	61.2	69.6
$25,000 - <$30,000	25.4	4,204	87.5	61.7	70.5
$30,000 - <$35,000	15.9	4,207	84.7	59.3	70.0
$35,000 or more	27.2	4,655	85.3	60.8	71.3
Median Household Income (cost-adjusted)					
Less than $20,000	10.0	3,894	89.4	61.9	69.2
$20,000 - <$25,000	27.9	4,101	88.1	62.0	70.3
$25,000 - <$30,000	25.9	4,078	86.8	61.1	70.4
$30,000 - <$35,000	15.8	4,337	85.2	60.0	70.5
$35,000 or more	20.5	4,792	84.6	59.8	70.7
Median Value Owner-Occupied Housing					
Less than $40,000	10.8	3,895	89.3	61.1	68.3
$40,000 - <$55,000	20.2	3,947	88.8	61.4	69.1
$55,000 - <$85,000	32.5	4,157	85.6	59.7	69.7
$85,000 or more	36.5	4,615	85.7	61.7	71.9
Education Attainment of Householders					
Less than 65% high school graduates	18.1	3,776	89.0	62.2	69.9
65% - <75% high school graduates	31.3	4,188	87.7	61.5	70.2
75% - <85% high school graduates	31.3	4,328	86.2	60.4	70.1
85% or more high school graduates	19.4	4,681	84.1	60.0	71.3
Population in Poverty					
Less than 5%	15.8	5,062	85.2	59.8	70.2
5% - <15%	47.4	4,182	85.9	60.4	70.4
15% - <25%	29.3	4,043	88.3	62.3	70.6
25% or more	7.4	3,819	89.2	61.5	68.9

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table A7.1.-- Actual and student-need-adjusted student/teacher ratios by district characteristics

District Characteristics	Percentage of Enrollment	Student/Teacher Ratios	
		Actual	Student-Need-Adjusted
TOTAL (N=39,783,948)		17.9	20.7
District Enrollment			
0 - 999	7.2	15.1	17.3
1,000 - 4,999	30.9	17.3	19.6
5,000 - 9,999	16.2	18.0	20.6
10,000 or more	45.7	18.8	22.0
District Type			
Elementary	0.9	19.9	23.1
Secondary	2.2	19.6	22.1
Unified	97.0	17.9	20.6
School-Age Children in Poverty			
Less than 5%	11.3	16.7	18.4
5% - <15%	36.1	18.3	20.7
15% - <25%	26.4	18.1	21.0
25% or more	26.1	17.9	21.3
Special Education Students			
Less than 3%	17.4	17.4	18.2
3% - <10%	44.3	18.9	21.7
10% or more	38.3	17.1	20.6
Limited English Proficient Children			
0%	9.3	16.2	18.5
>0% - <5%	69.4	17.6	20.2
5% or more	21.3	19.7	23.3
Minority Enrollment			
Less than 5%	21.9	17.0	19.1
5% - <20%	26.5	17.8	20.2
20% - <50%	25.7	18.2	21.0
50% or more	25.9	18.7	22.2
School-Age At-Risk Children			
Less than 3%	45.5	17.8	20.0
3% - <5%	15.5	18.1	20.9
5% or more	39.0	18.1	21.4
Expenditures per Student			
Less than $4,000	21.3	18.8	21.8
$4,000 - <$6,000	55.6	18.5	21.3
$6,000 or more	23.1	15.9	18.4

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table A7.2.-- Actual and student-need-adjusted student/teacher ratios by community characteristics

Community Characteristics	Percentage of Enrollment	Student/Teacher Ratios	
		Actual	Student-Need-Adjusted
TOTAL (N=39,783,948)		17.9	20.7
Metropolitan Status			
Urban/central cities	26.7	18.3	21.6
Suburban/metropolitan	47.4	18.3	20.7
Rural	25.9	17.0	19.6
Geographic Region			
Northeast	16.9	15.6	17.8
Midwest	24.6	17.3	19.4
South	36.4	17.1	20.0
West	22.1	21.9	25.5
Median Household Income (actual)			
Less than $20,000	10.2	16.7	19.8
$20,000 - <$25,000	21.2	17.4	20.3
$25,000 - <$30,000	25.3	17.7	20.6
$30,000 - <$35,000	16.0	19.1	21.9
$35,000 or more	27.2	18.3	20.6
Median Household Income (cost-adjusted)			
Less than $20,000	10.0	17.0	20.2
$20,000 - <$25,000	27.7	17.9	21.0
$25,000 - <$30,000	25.9	18.1	20.9
$30,000 - <$35,000	15.9	18.4	20.8
$35,000 or more	20.5	18.0	20.1
Median Value Owner-Occupied Housing			
Less than $40,000	10.9	16.2	19.1
$40,000 - <$55,000	20.3	17.3	20.1
$55,000 - <$85,000	32.6	17.9	20.5
$85,000 or more	36.2	18.9	21.7
Education Attainment of Householders			
Less than 65% high school graduates	18.1	17.4	20.4
65% - <75% high school graduates	31.2	17.8	20.7
75% - <85% high school graduates	31.2	18.1	20.8
85% or more high school graduates	19.5	18.4	20.7
Population in Poverty			
Less than 5%	15.8	17.1	18.9
5% - <15%	47.7	18.3	20.9
15% - <25%	29.1	18.0	21.3
25% or more	7.4	17.0	20.5

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table A8.1.-- Mean, median, and range of actual, cost-adjusted, student-need-adjusted, and cost- and student-need-adjusted per student revenues, total expenditures, current operating expenditures, core instructional expenditures, and student/teacher ratios across the nation and their relationship to measures of variation in district wealth

Revenue, Expenditure, and Wealth Measures	Number of Students	Mean	Median	Range
Local Revenues				
Actual	40,079,318	$2,413	$2,021	$43,277
Cost-adjusted	40,079,318	2,254	1,961	31,385
Student-need-adjusted	40,079,318	2,111	1,781	35,570
Cost- and student-need-adjusted	40,079,318	1,972	1,730	25,787
Local and State Revenues				
Actual	40,079,318	4,821	4,523	42,525
Cost-adjusted	40,079,318	4,531	4,294	30,515
Student-need-adjusted	40,079,318	4,197	3,967	36,313
Cost- and student-need-adjusted	40,079,318	3,945	3,767	26,042
Total Revenues				
Actual	40,079,318	5,112	4,776	42,317
Cost-adjusted	40,079,318	4,808	4,559	30,400
Student-need-adjusted	40,079,318	4,445	4,178	39,951
Cost- and student-need-adjusted	40,079,318	4,182	3,974	28,703
Total Expenditures				
Actual	40,079,318	5,196	4,833	40,568
Cost-adjusted	40,079,318	4,890	4,667	29,328
Student-need-adjusted	40,079,318	4,518	4,238	34,265
Cost- and student-need-adjusted	40,079,318	4,253	4,080	24,265
Current Operating Expenditures				
Actual	40,079,318	4,509	4,175	32,025
Cost-adjusted	40,079,318	4,238	4,010	23,094
Student-need-adjusted	40,079,318	3,919	3,650	29,412
Cost- and student-need-adjusted	40,079,318	3,685	3,478	21,023
Core Instructional Expenditures				
Actual	40,079,318	3,180	2,963	18,471
Cost-adjusted	40,079,318	2,981	2,807	14,922
Student-need-adjusted	40,079,318	2,763	2,583	17,102
Cost- and student-need-adjusted	40,079,318	2,591	2,462	14,013
Student/Teacher Ratios				
Actual	39,783,948	17.9	17.5	23.9
Student-need-adjusted	39,783,948	20.7	20.3	34.2
Median Household Income (actual)	40,079,318	30,751	28,476	139,711
Median Value Owner-Occupied Housing	40,079,318	92,490	69,822	496,429

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table A8.2.-- Alternative measures of variation in actual, cost-adjusted, student-need-adjusted, and cost- and student-need-adjusted per student revenues, total expenditures, current operating expenditures, core instructional expenditures, and student/teacher ratios across the nation and their relationship to measures of variation in district wealth

Revenue, Expenditure, and Wealth Measures	Number of Students	Measures of Variation: Restricted range	Federal Range Ratio	McLoone Index	Coefficient of variation	Gini Coefficient
Local Revenues						
Actual	40,079,318	$5,018	8.0	0.615	69.0	0.352
Cost-adjusted	40,079,318	4,353	7.1	0.618	63.2	0.333
Student-need-adjusted	40,079,318	4,516	8.6	0.602	70.2	0.357
Cost- and student-need-adjusted	40,079,318	3,847	7.5	0.604	64.5	0.338
Local and State Revenues						
Actual	40,079,318	4,974	1.7	0.821	32.8	0.169
Cost-adjusted	40,079,318	3,861	1.3	0.845	27.2	0.143
Student-need-adjusted	40,079,318	4,476	1.8	0.810	33.4	0.172
Cost- and student-need-adjusted	40,079,318	3,414	1.3	0.831	28.0	0.148
Total Revenues						
Actual	40,079,318	4,889	1.5	0.835	31.4	0.161
Cost-adjusted	40,079,318	3,830	1.2	0.857	25.6	0.135
Student-need-adjusted	40,079,318	4,412	1.6	0.828	31.6	0.163
Cost- and student-need-adjusted	40,079,318	3,397	1.2	0.851	26.2	0.137
Total Expenditures						
Actual	40,079,318	5,116	1.6	0.833	31.6	0.164
Cost-adjusted	40,079,318	4,008	1.2	0.846	26.4	0.139
Student-need-adjusted	40,079,318	4,543	1.7	0.824	31.9	0.166
Cost- and student-need-adjusted	40,079,318	3,583	1.3	0.836	26.9	0.142
Current Operating Expenditures						
Actual	40,079,318	4,186	1.5	0.850	31.0	0.158
Cost-adjusted	40,079,318	3,373	1.1	0.869	24.6	0.129
Student-need-adjusted	40,079,318	3,658	1.5	0.843	31.1	0.159
Cost- and student-need-adjusted	40,079,318	2,935	1.2	0.867	25.0	0.132
Core Instructional Expenditures						
Actual	40,079,318	3,336	1.7	0.834	31.5	0.163
Cost-adjusted	40,079,318	2,317	1.1	0.875	24.4	0.129
Student-need-adjusted	40,079,318	2,668	1.6	0.829	31.4	0.164
Cost- and student-need-adjusted	40,079,318	2,051	1.2	0.863	24.5	0.131
Student/Teacher Ratios						
Actual	39,783,948	11.4	0.9	0.886	18.3	0.107
Student-need-adjusted	39,783,948	13.4	0.9	0.870	19.1	0.112
Median Household Income (actual)	40,079,318	33,526	1.9	0.808	34.4	0.181
Median Value Owner-Occupied Housing	40,079,318	192,707	5.7	0.711	69.6	0.345

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table A9.-- Least-squares estimates of unadjusted and adjusted total expenditures per student by district characteristics, controlling for other characteristics

District Characteristics	Percentage of Enrollment	Total Expenditures per Student: Unadjusted Estimates	Cost-Adjusted Estimates	Need-Adjusted Estimates	Cost- & Need-Adjusted Estimates
TOTAL (N=40,079,318)		$5,196	$4,890	$4,518	$4,253
District Enrollment					
0 - 999	7.1	5,905	5,606	5,126	4,862
1,000 - 4,999	30.9	5,199	4,862	4,530	4,235
5,000 - 9,999	16.2	5,090	4,739	4,429	4,123
10,000 or more	45.8	5,120	4,850	4,448	4,216
District Type					
Elementary	0.9	5,102	4,777	4,442	4,151
Secondary	2.2	6,493	5,887	5,755	5,201
Unified	97.0	5,168	4,869	4,491	4,233
School-Age Children in Poverty					
Less than 5%	11.3	5,689	5,097	5,062	4,528
5% - <15%	36.0	5,176	4,835	4,520	4,227
15% - <25%	26.3	5,091	4,850	4,412	4,205
25% or more	26.4	5,115	4,915	4,389	4,219
Special Education Students					
Less than 3%	17.3	4,932	4,713	4,713	4,510
3% - <10%	44.2	5,093	4,767	4,471	4,182
10% or more	38.5	5,433	5,110	4,486	4,219
Limited English Proficient Children					
0%	9.3	5,061	4,782	4,420	4,177
>0% - <5%	69.0	5,234	4,950	4,566	4,316
5% or more	21.6	5,133	4,744	4,409	4,084
Minority Enrollment					
Less than 5%	21.9	4,581	4,509	3,977	3,920
5% - <20%	26.4	4,954	4,745	4,322	4,140
20% - <50%	25.6	5,418	5,038	4,721	4,390
50% or more	26.1	5,740	5,212	4,973	4,514
School-Age At-Risk Children					
Less than 3%	45.4	5,220	4,878	4,557	4,259
3% - <5%	15.4	5,223	4,919	4,537	4,273
5% or more	39.2	5,157	4,892	4,467	4,239

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table A9.-- Least-squares estimates of unadjusted and adjusted total expenditures per student by community characteristics, controlling for other characteristics—Continued

Community Characteristics	Percentage of Enrollment	Total Expenditures per Student: Unadjusted Estimates	Cost-Adjusted Estimates	Need-Adjusted Estimates	Cost- & Need-Adjusted Estimates
TOTAL (N=40,079,318)		$5,196	$4,890	$4,518	$4,253
Metropolitan Status					
Urban/central cities	26.9	5,241	4,859	4,547	4,218
Suburban/metropolitan	47.3	5,198	4,811	4,528	4,189
Rural	25.7	5,145	5,069	4,470	4,408
Geographic Region					
Northeast	17.3	6,948	6,075	6,048	5,293
Midwest	24.5	5,336	5,029	4,646	4,383
South	36.3	4,708	4,654	4,095	4,047
West	22.0	4,468	4,194	3,873	3,632
Median Household Income (cost-adjusted)					
Less than $20,000	10.0	5,324	4,874	4,586	4,196
$20,000 - <$25,000	27.9	5,279	4,862	4,585	4,228
$25,000 - <$30,000	25.9	5,127	4,831	4,461	4,202
$30,000 - <$35,000	15.8	5,109	4,871	4,460	4,250
$35,000 or more	20.5	5,175	5,025	4,512	4,382
Median Value Owner-Occupied Housing					
Less than $40,000	10.8	4,634	4,603	4,027	3,992
$40,000 - <$55,000	20.2	4,751	4,676	4,150	4,074
$55,000 - <$85,000	32.5	5,074	4,917	4,422	4,285
$85,000 or more	36.5	5,717	5,069	4,954	4,401
Education Attainment of Householders					
Less than 65% high school graduates	18.1	4,972	4,568	4,306	3,953
65% - <75% high school graduates	31.3	5,127	4,791	4,452	4,166
75% - <85% high school graduates	31.3	5,264	4,998	4,582	4,351
85% or more high school graduates	19.4	5,406	5,175	4,720	4,515
R^2	.	0.51	0.34	0.52	0.37
(N)	.	14680	14680	14680	14680

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table A10.-- Least-squares estimates of unadjusted and adjusted current operating expenditures per student by district characteristics, controlling for other characteristics

District Characteristics	Percentage of Enrollment	Current Operating Expenditures per Student: Unadjusted Estimates	Cost-Adjusted Estimates	Need-Adjusted Estimates	Cost- & Need-Adjusted Estimates
TOTAL (N=40,079,318)		$4,509	$4,238	$3,919	$3,685
District Enrollment					
0 - 999	7.1	5,005	4,746	4,347	4,119
1,000 - 4,999	30.9	4,537	4,240	3,951	3,691
5,000 - 9,999	16.2	4,489	4,176	3,904	3,631
10,000 or more	45.8	4,419	4,180	3,836	3,632
District Type					
Elementary	0.9	3,946	3,707	3,461	3,244
Secondary	2.2	5,668	5,132	5,023	4,533
Unified	97.0	4,488	4,223	3,899	3,670
School-Age Children in Poverty					
Less than 5%	11.3	4,889	4,379	4,345	3,885
5% - <15%	36.0	4,474	4,173	3,907	3,649
15% - <25%	26.3	4,432	4,217	3,840	3,656
25% or more	26.4	4,469	4,287	3,832	3,678
Special Education Students					
Less than 3%	17.3	4,301	4,117	4,109	3,939
3% - <10%	44.2	4,396	4,110	3,857	3,604
10% or more	38.5	4,731	4,440	3,905	3,664
Limited English Proficient Children					
0%	9.3	4,344	4,104	3,794	3,584
>0% - <5%	69.0	4,539	4,289	3,959	3,740
5% or more	21.6	4,481	4,132	3,846	3,554
Minority Enrollment					
Less than 5%	21.9	3,940	3,881	3,419	3,373
5% - <20%	26.4	4,290	4,107	3,741	3,582
20% - <50%	25.6	4,693	4,358	4,089	3,798
50% or more	26.1	5,027	4,553	4,353	3,941
School-Age At-Risk Children					
Less than 3%	45.4	4,568	4,264	3,983	3,719
3% - <5%	15.4	4,529	4,259	3,933	3,698
5% or more	39.2	4,432	4,200	3,840	3,641

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table A10.-- Least-squares estimates of unadjusted and adjusted current operating expenditures per student by community characteristics, controlling for other characteristics—Continued

Community Characteristics	Percentage of Enrollment	Current Operating Expenditures per Student: Unadjusted Estimates	Cost-Adjusted Estimates	Need-Adjusted Estimates	Cost- & Need-Adjusted Estimates
TOTAL (N=40,079,318)		$4,509	$4,238	$3,919	$3,685
Metropolitan Status					
Urban/central cities	26.9	4,626	4,286	4,009	3,715
Suburban/metropolitan	47.3	4,484	4,146	3,907	3,610
Rural	25.7	4,430	4,358	3,848	3,791
Geographic Region					
Northeast	17.3	6,124	5,337	5,323	4,644
Midwest	24.5	4,616	4,344	4,020	3,788
South	36.3	4,027	3,984	3,503	3,464
West	22.0	3,915	3,675	3,392	3,182
Median Household Income (cost-adjusted)					
Less than $20,000	10.0	4,604	4,214	3,963	3,624
$20,000 - <$. 5,000	27.9	4,580	4,213	3,975	3,661
$25,000 - <$30,000	25.9	4,456	4,197	3,877	3,651
$30,000 - <$35,000	15.8	4,404	4,195	3,843	3,659
$35,000 or more	20.5	4,512	4,369	3,933	3,809
Median Value Owner-Occupied Housing					
Less than $40,000	10.8	4,166	4,132	3,617	3,580
$40,000 - <$55,000	20.2	4,194	4,127	3,661	3,593
$55,000 - <$85,000	32.5	4,357	4,219	3,797	3,676
$85,000 or more	36.5	4,919	4,349	4,261	3,775
Education Attainment of Householders					
Less than 65% high school graduates	18.1	4,373	4,016	3,784	3,474
65% - <75% high school graduates	31.3	4,477	4,181	3,886	3,633
75% - <85% high school graduates	31.3	4,571	4,334	3,979	3,773
85% or more high school graduates	19.4	4,585	4,382	4,002	3,823
R^2		0.55	0.39	0.55	0.41
(N)		14680	14680	14680	14680

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table A11.-- Least-squares estimates of unadjusted and adjusted core instructional expenditures per student by district characteristics, controlling for other characteristics

District Characteristics	Percentage of Enrollment	Core Instructional Expenditures per Student: Unadjusted Estimates	Cost-Adjusted Estimates	Need-Adjusted Estimates	Cost- & Need-Adjusted Estimates
TOTAL (N=40,079,318)		$3,180	$2,981	$2,763	$2,591
District Enrollment					
0 - 999	7.1	3,426	3,238	2,973	2,808
1,000 - 4,999	30.9	3,197	2,981	2,782	2,593
5,000 - 9,999	16.2	3,213	2,980	2,793	2,591
10,000 or more	45.8	3,118	2,942	2,706	2,557
District Type					
Elementary	0.9	2,867	2,685	2,514	2,349
Secondary	2.2	4,036	3,645	3,575	3,219
Unified	97.0	3,163	2,969	2,747	2,580
School-Age Children in Poverty					
Less than 5%	11.3	3,409	3,048	3,030	2,705
5% - <15%	36.0	3,153	2,935	2,753	2,565
15% - <25%	26.3	3,135	2,975	2,715	2,578
25% or more	26.4	3,162	3,024	2,709	2,592
Special Education Students					
Less than 3%	17.3	3,003	2,866	2,865	2,739
3% - <10%	44.2	3,111	2,904	2,729	2,546
10% or more	38.5	3,337	3,122	2,755	2,577
Limited English Proficient Children					
0%	9.3	3,040	2,864	2,653	2,500
>0% - <5%	69.0	3,171	2,992	2,766	2,608
5% or more	21.6	3,266	2,999	2,800	2,577
Minority Enrollment					
Less than 5%	21.9	2,807	2,756	2,435	2,395
5% - <20%	26.4	3,037	2,903	2,646	2,531
20% - <50%	25.6	3,299	3,054	2,875	2,661
50% or more	26.1	3,520	3,179	3,046	2,750
School-Age At-Risk Children					
Less than 3%	45.4	3,232	3,010	2,816	2,624
3% - <5%	15.4	3,203	3,003	2,779	2,606
5% or more	39.2	3,110	2,940	2,694	2,548

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table A11.-- Least-squares estimates of unadjusted and adjusted core instructional expenditures per student by community characteristics, controlling for other characteristics—Continued

Community Characteristics	Percentage of Enrollment	Core Instructional Expenditures per Student: Unadjusted Estimates	Cost-Adjusted Estimates	Need-Adjusted Estimates	Cost- & Need-Adjusted Estimates
TOTAL (N=40,079,318)		$3,180	$2,981	$2,763	$2,591
Metropolitan Status					
Urban/central cities	26.9	3,298	3,048	2,855	2,640
Suburban/metropolitan	47.3	3,145	2,900	2,740	2,525
Rural	25.7	3,119	3,063	2,708	2,663
Geographic Region					
Northeast	17.3	4,338	3,780	3,766	3,286
Midwest	24.5	3,182	2,987	2,767	2,601
South	36.3	2,805	2,773	2,441	2,412
West	22.0	2,885	2,692	2,500	2,331
Median Household Income (cost-adjusted)					
Less than $20,000	10.0	3,198	2,922	2,752	2,513
$20,000 - <$25,000	27.9	3,210	2,942	2,784	2,557
$25,000 - <$30,000	25.9	3,153	2,963	2,742	2,576
$30,000 - <$35,000	15.8	3,122	2,965	2,723	2,585
$35,000 or more	20.5	3,208	3,100	2,795	2,701
Median Value Owner-Occupied Housing					
Less than $40,000	10.8	2,937	2,904	2,552	2,518
$40,000 - <$55,000	20.2	2,951	2,900	2,576	2,525
$55,000 - <$85,000	32.5	3,050	2,951	2,657	2,570
$85,000 or more	36.5	3,493	3,077	3,023	2,669
Education Attainment of Householders					
Less than 65% high school graduates	18.1	3,117	2,857	2,695	2,470
65% - <75% high school graduates	31.3	3,156	2,940	2,738	2,554
75% - <85% high school graduates	31.3	3,198	3,024	2,782	2,632
85% or more high school graduates	19.4	3,246	3,096	2,833	2,700
R^2		0.58	0.40	0.58	0.42
(N)		14680	14680	14680	14680

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table A12.-- Least-squares estimates of unadjusted and student-need-adjusted student/teacher ratios by district characteristics, controlling for other characteristics

District Characteristics	Percentage of Enrollment	Student/Teacher Ratios	
		Unadjusted Estimates	Student-Need-Adjusted Estimates
TOTAL (N=39,783,948)		17.9	20.7
District Enrollment			
0 - 999	7.2	15.3	17.7
1,000 - 4,999	30.9	17.6	20.3
5,000 - 9,999	16.2	18.1	20.8
10,000 or more	45.7	18.5	21.4
District Type			
Elementary	0.9	19.3	22.2
Secondary	2.2	17.6	20.0
Unified	97.0	17.9	20.7
School-Age Children in Poverty			
Less than 5%	11.3	17.1	19.4
5% - <15%	36.1	17.9	20.5
15% - <25%	26.4	18.1	20.9
25% or more	26.1	18.2	21.2
Special Education Students			
Less than 3%	17.4	18.6	19.6
3% - <10%	44.3	18.0	20.6
10% or more	38.3	17.6	21.3
Limited English Proficient Children			
0%	9.3	18.0	20.6
>0% - <5%	69.4	17.8	20.5
5% or more	21.3	18.3	21.3
Minority Enrollment			
Less than 5%	21.9	18.7	21.5
5% - <20%	26.5	18.0	20.7
20% - <50%	25.7	17.7	20.4
50% or more	25.9	17.5	20.3
School-Age At-Risk Children			
Less than 3%	45.5	17.7	20.4
3% - <5%	15.5	17.9	20.7
5% or more	39.0	18.2	21.0

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table A12.-- Least-squares estimates of unadjusted and student-need-adjusted student/teacher ratios by community characteristics, controlling for other characteristics—Continued

Community Characteristics	Percentage of Enrollment	Student/Teacher Ratios: Unadjusted Estimates	Student/Teacher Ratios: Student-Need-Adjusted Estimates
TOTAL (N=39,783,948)		17.9	20.7
Metropolitan Status			
Urban/central cities	26.7	17.7	20.5
Suburban/metropolitan	47.4	18.2	21.0
Rural	25.9	17.7	20.4
Geographic Region			
Northeast	16.9	15.4	17.7
Midwest	24.6	17.7	20.2
South	36.4	17.0	19.7
West	22.1	21.7	25.1
Median Household Income (cost-adjusted)			
Less than $20,000	10.0	17.4	20.3
$20,000 - <$25,000	27.7	17.7	20.4
$25,000 - <$30,000	25.9	17.8	20.6
$30,000 - <$35,000	15.9	18.3	21.0
$35,000 or more	20.5	18.4	21.1
Median Value Owner-Occupied Housing			
Less than $40,000	10.9	17.3	20.0
$40,000 - <$55,000	20.3	17.8	20.5
$55,000 - <$85,000	32.6	17.7	20.4
$85,000 or more	36.2	18.4	21.3
Education Attainment of Householders			
Less than 65% high school graduates	18.1	18.5	21.5
65% - <75% high school graduates	31.2	18.3	21.0
75% - <85% high school graduates	31.2	17.7	20.3
85% or more high school graduates	19.5	17.4	20.0
R^2	.	0.56	0.58
(N)	.	14551	14551

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Appendix B

Standard Deviations for Bivariate Values
(Weighted by Student Enrollment)

Table B1.1.-- Standard deviations of actual and adjusted total revenues per student by district characteristics

District Characteristics	Percentage of Enrollment	Total Revenues per Student			
		Actual	Cost-Adjusted	Need-Adjusted	Cost- & Need-Adjusted
TOTAL (N=40,079,318)		$1,603	$1,233	$1,406	$1,094
District Enrollment					
0 - 999	7.1	2,075	1,764	1,818	1,536
1,000 - 4,999	30.9	1,844	1,360	1,667	1,243
5,000 - 9,999	16.2	1,706	1,232	1,515	1,106
10,000 or more	45.8	1,270	1,000	1,053	846
District Type					
Elementary	0.9	2,412	2,175	2,068	1,830
Secondary	2.2	2,182	1,889	2,107	1,803
Unified	97.0	1,561	1,194	1,359	1,053
School-Age Children in Poverty					
Less than 5%	11.3	2,129	1,532	1,894	1,385
5% - <15%	36.0	1,506	1,234	1,310	1,078
15% - <25%	26.3	1,211	1,047	1,026	898
25% or more	26.4	1,517	1,115	1,244	925
Special Education Students					
Less than 3%	17.3	1,486	1,141	1,448	1,114
3% - <10%	44.2	1,402	1,116	1,281	1,021
10% or more	38.5	1,817	1,324	1,492	1,096
Limited English Proficient Children					
0%	9.3	1,820	1,538	1,614	1,360
>0% - <5%	69.0	1,575	1,217	1,412	1,091
5% or more	21.6	1,549	1,123	1,276	932
Minority Enrollment					
Less than 5%	21.9	1,553	1,264	1,386	1,127
5% - <20%	26.4	1,774	1,311	1,620	1,205
20% - <50%	25.6	1,459	1,181	1,279	1,033
50% or more	26.1	1,565	1,169	1,296	973
School-Age At-Risk Children					
Less than 3%	45.4	1,778	1,363	1,587	1,222
3% - <5%	15.4	1,346	1,106	1,164	961
5% or more	39.2	1,438	1,088	1,193	915
Expenditures per Student					
Less than $4,000	21.3	432	424	459	444
$4,000 - <$6,000	55.6	609	659	573	616
$6,000 or more	23.2	1,665	1,272	1,479	1,150

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table B1.2.-- Standard deviations of actual and adjusted total revenues per student by community characteristics

Community Characteristics	Percentage of Enrollment	Total Revenues per Student			
		Actual	Cost-Adjusted	Need-Adjusted	Cost- & Need-Adjusted
TOTAL (N=40,079,318)		$1,603	$1,233	$1,406	$1,094
Metropolitan Status					
Urban/central cities	26.9	1,355	1,033	1,101	859
Suburban/metropolitan	47.3	1,765	1,321	1,585	1,199
Rural	25.7	1,334	1,243	1,154	1,084
Geographic Region					
Northeast	17.3	1,773	1,256	1,524	1,121
Midwest	24.5	1,220	1,120	1,082	976
South	36.3	1,084	935	946	824
West	22.0	1,187	1,050	1,016	897
Median Household Income (actual)					
Less than $20,000	10.1	1,218	1,095	1,022	923
$20,000 - <$25,000	21.3	1,258	1,127	1,110	1,000
$25,000 - <$30,000	25.4	1,363	1,008	1,071	818
$30,000 - <$35,000	15.9	1,277	1,120	1,102	989
$35,000 or more	27.2	1,991	1,504	1,765	1,353
Median Household Income (cost-adjusted)					
Less than $20,000	10.0	1,535	1,169	1,327	1,014
$20,000 - <$25,000	27.9	1,433	1,093	1,164	918
$25,000 - <$30,000	25.9	1,197	1,041	1,036	900
$30,000 - <$35,000	15.8	1,550	1,229	1,364	1,085
$35,000 or more	20.5	2,059	1,523	1,835	1,369
Median Value Owner-Occupied Housing					
Less than $40,000	10.8	1,261	1,145	1,088	1,004
$40,000 - <$55,000	20.2	1,180	1,081	1,053	951
$55,000 - <$85,000	32.5	1,140	1,014	1,007	896
$85,000 or more	36.5	1,790	1,402	1,557	1,246
Education Attainment of Householders					
Less than 65% high school graduates	18.1	1,335	1,048	1,157	908
65% - <75% high school graduates	31.3	1,463	1,110	1,202	941
75% - <85% high school graduates	31.3	1,488	1,202	1,303	1,057
85% or more high school graduates	19.4	1,971	1,486	1,773	1,345
Population in Poverty					
Less than 5%	15.8	2,062	1,509	1,836	1,360
5% - <15%	47.4	1,353	1,144	1,162	991
15% - <25%	29.3	1,439	1,084	1,181	906
25% or more	7.4	1,483	1,162	1,222	966

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table B2.1.-- Standard deviations of total revenues per student and percentage shares from local, state, and federal sources by district characteristics

District Characteristics	Percentage of Enrollment	Total Revenues per Student	Percent Shares: From Local Sources	Percent Shares: From State Sources	Percent Shares: From Federal Sources
TOTAL (N=40,079,318)		$1,603	19.8	18.0	4.3
District Enrollment					
0 - 999	7.1	2,075	21.3	19.4	5.9
1,000 - 4,999	30.9	1,844	21.2	18.7	5.2
5,000 - 9,999	16.2	1,706	20.7	18.5	4.1
10,000 or more	45.8	1,270	18.0	16.9	3.2
District Type					
Elementary	0.9	2,412	22.7	20.5	5.0
Secondary	2.2	2,182	23.5	22.4	2.7
Unified	97.0	1,561	19.7	17.8	4.3
School-Age Children in Poverty					
Less than 5%	11.3	2,129	17.1	16.5	2.5
5% - <15%	36.0	1,506	18.8	17.9	2.6
15% - <25%	26.3	1,211	15.8	14.8	3.0
25% or more	26.4	1,517	16.8	15.9	4.3
Special Education Students					
Less than 3%	17.3	1,486	20.0	17.5	4.4
3% - <10%	44.2	1,402	20.8	19.2	4.2
10% or more	38.5	1,817	18.3	16.3	4.3
Limited English Proficient Children					
0%	9.3	1,820	21.0	18.6	6.0
>0% - <5%	69.0	1,575	19.3	17.4	4.0
5% or more	21.6	1,549	19.6	18.6	3.9
Minority Enrollment					
Less than 5%	21.9	1,553	19.6	17.9	3.2
5% - <20%	26.4	1,774	20.0	18.6	3.1
20% - <50%	25.6	1,459	18.4	16.8	3.8
50% or more	26.1	1,565	17.7	16.9	4.5
School-Age At-Risk Children					
Less than 3%	45.4	1,778	20.2	19.0	3.0
3% - <5%	15.4	1,346	17.9	16.9	3.2
5% or more	39.2	1,438	16.3	15.2	4.1
Expenditures per Student					
Less than $4,000	21.3	432	14.6	12.5	4.8
$4,000 - <$6,000	55.6	609	18.9	17.4	3.8
$6,000 or more	23.2	1,665	19.6	17.8	4.2

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table B2.2.-- Standard deviations of total revenues per student and percentage shares from local, state, and federal sources by community characteristics

Community Characteristics	Percentage of Enrollment	Total Revenues per Student	Percent Shares: From Local Sources	Percent Shares: From State Sources	Percent Shares: From Federal Sources
TOTAL (N=40,079,318)		$1,603	19.8	18.0	4.3
Metropolitan Status					
Urban/central cities	26.9	1,355	17.9	17.0	2.8
Suburban/metropolitan	47.3	1,765	20.2	18.6	3.1
Rural	25.7	1,334	18.6	16.6	5.7
Geographic Region					
Northeast	17.3	1,773	18.4	16.7	3.3
Midwest	24.5	1,220	17.2	15.8	3.9
South	36.3	1,084	17.1	15.0	4.2
West	22.0	1,187	19.1	18.1	4.6
Median Household Income (actual)					
Less than $20,000	10.1	1,218	14.1	12.8	6.2
$20,000 - <$25,000	21.3	1,258	14.9	13.9	3.7
$25,000 - <$30,000	25.4	1,363	16.0	15.5	2.9
$30,000 - <$35,000	15.9	1,277	19.9	18.9	2.7
$35,000 or more	27.2	1,991	21.5	20.3	2.3
Median Household Income (cost-adjusted)					
Less than $20,000	10.0	1,535	14.2	13.0	6.0
$20,000 - <$25,000	27.9	1,433	16.0	15.2	3.4
$25,000 - <$30,000	25.9	1,197	18.0	17.1	3.1
$30,000 - <$35,000	15.8	1,550	18.4	17.5	2.2
$35,000 or more	20.5	2,059	19.1	18.4	2.1
Median Value Owner-Occupied Housing					
Less than $40,000	10.8	1,261	17.1	14.6	6.6
$40,000 - <$55,000	20.2	1,180	14.8	13.4	4.3
$55,000 - <$85,000	32.5	1,140	17.1	16.0	3.4
$85,000 or more	36.5	1,790	23.0	21.3	3.1
Education Attainment of Householders					
Less than 65% high school graduates	18.1	1,335	13.7	12.5	5.2
65% - <75% high school graduates	31.3	1,463	15.8	15.3	3.2
75% - <85% high school graduates	31.3	1,488	19.0	17.7	3.0
85% or more high school graduates	19.4	1,971	20.9	19.6	3.6
Population in Poverty					
Less than 5%	15.8	2,062	17.3	16.6	2.5
5% - <15%	47.4	1,353	18.0	17.0	2.9
15% - <25%	29.3	1,439	16.4	15.9	2.8
25% or more	7.4	1,483	13.9	12.9	6.5

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table B3.1.-- Standard deviations of actual and adjusted total expenditures per student by district characteristics

District Characteristics	Percentage of Enrollment	Total Expenditures per Student			
		Actual	Cost-Adjusted	Need-Adjusted	Cost- & Need-Adjusted
TOTAL (N=40,079,318)		$1,640	$1,289	$1,440	$1,143
District Enrollment					
0 - 999	7.1	2,174	1,895	1,888	1,632
1,000 - 4,999	30.9	1,896	1,431	1,712	1,305
5,000 - 9,999	16.2	1,718	1,257	1,529	1,130
10,000 or more	45.8	1,289	1,045	1,079	893
District Type					
Elementary	0.9	2,508	2,256	2,130	1,880
Secondary	2.2	2,053	1,781	1,978	1,691
Unified	97.0	1,604	1,258	1,401	1,111
School-Age Children in Poverty					
Less than 5%	11.3	2,140	1,556	1,901	1,402
5% - <15%	36.0	1,557	1,308	1,352	1,141
15% - <25%	26.3	1,255	1,109	1,063	950
25% or more	26.4	1,526	1,151	1,262	967
Special Education Students					
Less than 3%	17.3	1,533	1,193	1,494	1,164
3% - <10%	44.2	1,444	1,188	1,315	1,080
10% or more	38.5	1,852	1,381	1,525	1,146
Limited English Proficient Children					
0%	9.3	1,919	1,653	1,697	1,452
>0% - <5%	69.0	1,617	1,274	1,450	1,142
5% or more	21.6	1,528	1,145	1,261	954
Minority Enrollment					
Less than 5%	21.9	1,659	1,383	1,481	1,233
5% - <20%	26.4	1,809	1,360	1,648	1,243
20% - <50%	25.6	1,501	1,245	1,315	1,088
50% or more	26.1	1,537	1,170	1,277	978
School-Age At-Risk Children					
Less than 3%	45.4	1,833	1,435	1,635	1,284
3% - <5%	15 4	1,381	1,165	1,195	1,013
5% or more	39.2	1,449	1,123	1,207	948

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table B3.2.-- Standard deviations of actual and adjusted total expenditures per student by community characteristics

Community Characteristics	Percentage of Enrollment	Total Expenditures per Student: Actual	Cost-Adjusted	Need-Adjusted	Cost- & Need-Adjusted
TOTAL (N=40,079,318)		$1,640	$1,289	$1,440	$1,143
Metropolitan Status					
Urban/central cities	26.9	1,355	1,066	1,114	902
Suburban/metropolitan	47.3	1,793	1,367	1,609	1,237
Rural	25.7	1,406	1,335	1,211	1,157
Geographic Region					
Northeast	17.3	1,845	1,374	1,606	1,240
Midwest	24.5	1,263	1,161	1,118	1,012
South	36.3	1,156	1,018	1,003	888
West	22.0	1,218	1,093	1,038	931
Median Household Income (actual)					
Less than $20,000	10.1	1,274	1,174	1,071	989
$20,000 - <$25,000	21.3	1,304	1,195	1,153	1,061
$25,000 - <$30,000	25.4	1,405	1,069	1,115	876
$30,000 - <$35,000	15.9	1,347	1,204	1,158	1,058
$35,000 or more	27.2	2,002	1,537	1,774	1,381
Median Household Income (cost-adjusted)					
Less than $20,000	10.0	1,545	1,206	1,338	1,046
$20,000 - <$25,000	27.9	1,477	1,159	1,211	984
$25,000 - <$30,000	25.9	1,249	1,104	1,076	951
$30,000 - <$35,000	15.8	1,612	1,306	1,421	1,155
$35,000 or more	20.5	2,064	1,552	1,836	1,389
Median Value Owner-Occupied Housing					
Less than $40,000	10.8	1,271	1,186	1,094	1,035
$40,000 - <$55,000	20.2	1,249	1,150	1,111	1,009
$55,000 - <$85,000	32.5	1,195	1,085	1,051	953
$85,000 or more	36.5	1,807	1,447	1,577	1,289
Education Attainment of Householders					
Less than 65% high school graduates	18.1	1,356	1,104	1,171	949
65% - <75% high school graduates	31.3	1,493	1,156	1,233	986
75% - <85% high school graduates	31.3	1,534	1,264	1,340	1,106
85% or more high school graduates	19.4	2,000	1,541	1,802	1,395
Population in Poverty					
Less than 5%	15.8	2,067	1,525	1,840	1,374
5% - <15%	47.4	1,417	1,227	1,215	1,060
15% - <25%	29.3	1,461	1,127	1,208	952
25% or more	7.4	1,493	1,211	1,237	1,012

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table B4.1.-- Standard deviations of actual and adjusted current operating expenditures per student by district characteristics

District Characteristics	Percentage of Enrollment	Current Operating Expenditures per Student: Actual	Cost-Adjusted	Need-Adjusted	Cost- & Need-Adjusted
TOTAL (N=40,079,318)		$1,396	$1,041	$1,217	$ 920
District Enrollment					
0 - 999	7.1	1,601	1,367	1,404	1,188
1,000 - 4,999	30.9	1,609	1,168	1,446	1,060
5,000 - 9,999	16.2	1,503	1,058	1,326	944
10,000 or more	45.8	1,145	860	945	726
District Type					
Elementary	0.9	1,434	1,175	1,322	1,053
Secondary	2.2	1,747	1,466	1,686	1,403
Unified	97.0	1,375	1,022	1,189	897
School-Age Children in Poverty					
Less than 5%	11.3	1,947	1,370	1,722	1,227
5% - <15%	36.0	1,285	1,030	1,115	901
15% - <25%	26.3	994	849	845	734
25% or more	26.4	1,358	957	1,113	799
Special Education Students					
Less than 3%	17.3	1,213	921	1,177	891
3% - <10%	44.2	1,219	947	1,108	863
10% or more	38.5	1,614	1,127	1,323	931
Limited English Proficient Children					
0%	9.3	1,415	1,189	1,263	1,056
>0% - <5%	69.0	1,373	1,038	1,229	931
5% or more	21.6	1,393	980	1,132	798
Minority Enrollment					
Less than 5%	21.9	1,299	1,032	1,157	920
5% - <20%	26.4	1,563	1,140	1,419	1,039
20% - <50%	25.6	1,214	959	1,073	852
50% or more	26.1	1,405	1,014	1,156	839
School-Age At-Risk Children					
Less than 3%	45.4	1,563	1,174	1,388	1,047
3% - <5%	15.4	1,137	918	984	799
5% or more	39.2	1,252	900	1,036	761

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table B4.2.-- Standard deviations of actual and adjusted current operating expenditures per student by community characteristics

Community Characteristics	Percentage of Enrollment	Current Operating Expenditures per Student			
		Actual	Cost-Adjusted	Need-Adjusted	Cost- & Need-Adjusted
TOTAL (N=40,079,318)		$1,396	$1,041	$1,217	$ 920
Metropolitan Status					
Urban/central cities	26.9	1,239	921	1,004	767
Suburban/metropolitan	47.3	1,546	1,127	1,385	1,023
Rural	25.7	1,051	973	907	849
Geographic Region					
Northeast	17.3	1,650	1,136	1,399	996
Midwest	24.5	1,011	920	894	802
South	36.3	849	713	744	632
West	22.0	1,004	861	846	723
Median Household Income (actual)					
Less than $20,000	10.1	1,033	908	870	769
$20,000 - <$25,000	21.3	1,074	948	951	848
$25,000 - <$30,000	25.4	1,235	873	965	704
$30,000 - <$35,000	15.9	1,094	898	940	798
$35,000 or more	27.2	1,769	1,302	1,559	1,164
Median Household Income (cost-adjusted)					
Less than $20,000	10.0	1,317	986	1,138	858
$20,000 - <$25,000	27.9	1,294	946	1,046	792
$25,000 - <$30,000	25.9	989	856	860	746
$30,000 - <$35,000	15.8	1,324	1,009	1,165	897
$35,000 or more	20.5	1,841	1,325	1,632	1,184
Median Value Owner-Occupied Housing					
Less than $40,000	10.8	1,048	933	900	816
$40,000 - <$55,000	20.2	1,009	903	901	797
$55,000 - <$85,000	32.5	951	845	842	751
$85,000 or more	36.5	1,625	1,217	1,399	1,072
Education Attainment of Householders					
Less than 65% high school graduates	18.1	1,134	879	978	758
65% - 75% high school graduates	31.3	1,299	944	1,057	794
75% - 85% high school graduates	31.3	1,302	1,019	1,137	896
875% or more high school graduates	19.4	1,742	1,281	1,566	1,161
Population in Poverty					
Less than 5%	15.8	1,856	1,322	1,645	1,186
5% - <15%	47.4	1,145	947	980	822
15% - <25%	29 3	1,286	931	1,051	779
25% or more	7.4	1,275	969	1,055	812

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table B5.1.-- Standard deviations of actual and adjusted core instructional expenditures per student by district characteristics

District Characteristics	Percentage of Enrollment	Core Instructional Expenditures per Student			
		Actual	Cost-Adjusted	Need-Adjusted	Cost- & Need-Adjusted
TOTAL (N=40,079,318)		$1,003	$ 728	$ 866	$ 636
District Enrollment					
0 - 999	7.1	1,086	929	950	802
1,000 - 4,999	30.9	1,136	829	1,014	745
5,000 - 9,999	16.2	1,082	749	947	660
10,000 or more	45.8	851	599	698	501
District Type					
Elementary	0.9	976	779	901	702
Secondary	2.2	1,081	875	1,044	840
Unified	97.0	990	717	849	623
School-Age Children in Poverty					
Less than 5%	11.3	1,353	943	1,186	835
5% - <15%	36.0	910	714	785	618
15% - <25%	26.3	741	603	628	519
25% or more	26.4	1,010	679	821	558
Special Education Students					
Less than 3%	17.3	837	630	813	611
3% - <10%	44.2	853	635	772	577
10% or more	38.5	1,195	831	978	685
Limited English Proficient Children					
0%	9.3	987	829	876	729
>0% - <5%	69.0	967	726	863	650
5% or more	21.6	1,006	671	815	541
Minority Enrollment					
Less than 5%	21.9	941	753	830	662
5% - <20%	26.4	1,094	793	987	717
20% - <50%	25.6	878	665	776	591
50% or more	26.1	1,008	684	823	558
School-Age At-Risk Children					
Less than 3%	45.4	1,097	814	968	719
3% - <5%	15.4	800	619	691	537
5% or more	39.2	942	648	774	541

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table B5.2.-- Standard deviations of actual and adjusted core instructional expenditures per student by community characteristics

Community Characteristics	Percentage of Enrollment	Core Instructional Expenditures per Student			
		Actual	Cost-Adjusted	Need-Adjusted	Cost- & Need-Adjusted
TOTAL (N=40,079,318)		$1,003	$ 728	$ 866	$ 636
Metropolitan Status					
Urban/central cities	26.9	938	658	750	536
Suburban/metropolitan	47.3	1,088	776	969	700
Rural	25.7	715	677	618	589
Geographic Region					
Northeast	17.3	1,189	817	980	690
Midwest	24.5	716	652	624	558
South	36.3	590	499	524	451
West	22.0	704	551	603	468
Median Household Income (actual)					
Less than $20,000	10.1	664	591	561	501
$20,000 - <$25,000	21.3	758	655	663	578
$25,000 - <$30,000	25.4	966	670	755	534
$30,000 - <$35,000	15.9	778	614	662	540
$35,000 or more	27.2	1,212	873	1,057	771
Median Household Income (cost-adjusted)					
Less than $20,000	10.0	894	659	770	570
$20,000 - <$25,000	27.9	990	692	795	569
$25,000 - <$30,000	25.9	726	606	627	524
$30,000 - <$35,000	15.8	947	697	828	614
$35,000 or more	20.5	1,265	897	1,113	793
Median Value Owner-Occupied Housing					
Less than $40,000	10.8	720	637	618	554
$40,000 - <$55,000	20.2	680	614	608	541
$55,000 - <$85,000	32.5	662	586	583	518
$85,000 or more	36.5	1,136	828	961	715
Education Attainment of Householders					
Less than 65% high school graduates	18.1	777	583	668	502
65% - <75% high school graduates	31.3	987	699	797	578
75% - <85% high school graduates	31.3	929	704	806	613
85% or more high school graduates	19.4	1,200	865	1,071	776
Population in Poverty					
Less than 5%	15.8	1,293	913	1,134	807
5% - <15%	47.4	824	658	703	567
15% - <25%	29.3	974	674	789	555
25% or more	7.4	842	634	692	526

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table B6.1.-- Standard deviations of cost- and need-adjusted total expenditures per student and percentage shares for current operating and core instructional expenditures by district characteristics

District Characteristics	Percentage of Enrollment	Cost- & Need-Adjusted	Percent Share for Current Expenditures	Percent Share for Core Expenditures	Percent Share of Current Expenditures for Core Expenditures
TOTAL (N=40,079,318)		$1,143	8.3	8.0	5.5
District Enrollment					
0 - 999	7.1	1,632	10.7	9.1	5.8
1,000 - 4,999	30.9	1,305	8.8	7.8	5.1
5,000 - 9,999	16.2	1,130	7.9	7.5	5.3
10,000 or more	45.8	893	7.5	7.9	5.6
District Type					
Elementary	0.9	1,880	16.4	15.5	7.6
Secondary	2.2	1,691	7.9	9.1	7.0
Unified	97.0	1,111	8.1	7.8	5.4
School-Age Children in Poverty					
Less than 5%	11.3	1,402	9.9	8.4	5.1
5% - <15%	36.0	1,141	8.6	7.9	5.3
15% - <25%	26.3	950	7.9	8.6	6.5
25% or more	26.4	967	6.7	6.7	4.9
Special Education Students					
Less than 3%	17.3	1,164	8.1	6.7	4.2
3% - <10%	44.2	1,080	8.2	8.1	5.7
10% or more	38.5	1,146	8.4	8.2	5.5
Limited English Proficient Children					
0%	9.3	1,452	10.1	8.6	5.6
>0% - <5%	69.0	1,142	8.3	7.6	5.1
5% or more	21.6	954	7.0	7.6	5.3
Minority Enrollment					
Less than 5%	21.9	1,233	9.3	7.9	4.7
5% - <20%	26.4	1,243	8.7	7.8	5.2
20% - <50%	25.6	1,088	8.2	8.6	6.3
50% or more	26.1	978	6.5	7.1	5.4
School-Age At-Risk Children					
Less than 3%	45.4	1,284	8.9	7.9	5.2
3% - <5%	15.4	1,013	8.3	8.4	6.2
5% or more	39.2	948	7.3	7.8	5.6

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table B6.2.-- Standard deviations of cost- and need-adjusted total expenditures per student and percentage shares for current operating and core instructional expenditures by community characteristics

Community Characteristics	Percentage of Enrollment	Cost- & Need-Adjusted	Percent Share for Current Expenditures	Percent Share for Core Expenditures	Percent Share of Current Expenditures for Core Expenditures
TOTAL (N=40,079,318)		$1,143	8.3	8.0	5.5
Metropolitan Status					
Urban/central cities	26.9	902	6.4	6.9	5.4
Suburban/metropolitan	47.3	1,237	8.9	8.5	5.7
Rural	25.7	1,157	8.5	7.6	5.1
Geographic Region					
Northeast	17.3	1,240	8.7	7.7	4.1
Midwest	24.5	1,012	7.9	6.7	4.6
South	36.3	888	8.5	7.7	4.8
West	22.0	931	8.0	8.5	6.1
Median Household Income (actual)					
Less than $20,000	10.1	989	7.2	6.8	5.0
$20,000 - <$25,000	21.3	1,061	7.7	7.4	5.1
$25,000 - <$30,000	25.4	876	7.4	7.8	5.6
$30,000 - <$35,000	15.9	1,058	8.9	8.7	5.6
$35,000 or ore	27.2	1,381	8.9	8.4	5.5
Median Household Income (cost-adjusted)					
Less than $20,000	10.0	1,046	6.8	6.7	5.3
$20,000 - <$25,000	27.9	984	7.3	7.6	5.3
$25,000 - <$30,000	25.9	951	7.9	8.2	5.9
$30,000 - <$35,000	15.8	1,155	9.0	8.5	5.7
$35,000 or more	20.5	1,389	9.2	8.0	5.0
Median Value Owner-Occupied Housing					
Less than $40,000	10.8	1,035	7.1	7.0	5.2
$40,000 - <$55,000	20.2	1,009	6.8	6.6	4.5
$55,000 - <$85,000	32.5	953	8.4	7.8	5.3
$85,000 or more	36.5	1,289	8.8	8.9	5.7
Education Attainment of Householders					
Less than 65% high school graduates	18.1	949	7.4	7.1	5.4
65% - <75% high school graduates	31.3	986	7.3	7.2	5.1
75% - <85% high school graduates	31.3	1,106	8.5	8.6	6.0
85% or more high school graduates	19.4	1,395	9.2	8.5	5.2
Population in Poverty					
Less than 5%	15.8	1,374	9.3	8.1	4.9
5% - <15%	47.4	1,060	8.6	8.5	5.9
15% - <25%	29.3	952	6.7	7.0	5.1
25% or more	7.4	1,012	8.1	7.2	5.2

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table B7.1.-- Standard deviations of actual and student-need-adjusted student/teacher ratios by district characteristics

District Characteristics	Percentage of Enrollment	Student/Teacher Ratios	
		Actual	Student-Need-Adjusted
TOTAL (N=39,783,948)	3.3	4.0	
District Enrollment			
0 - 999	7.2	3.3	3.8
1,000 - 4,999	30.9	3.0	3.6
5,000 - 9,999	16.2	3.3	4.0
10,000 or more	45.7	3.1	3.7
District Type			
Elementary	0.9	5.5	6.4
Secondary	2.2	4.6	5.4
Unified	97.0	3.2	3.9
School-Age Children in Poverty			
Less than 5%	11.3	3.5	3.9
5% - <15%	36.1	3.4	4.0
15% - <25%	26.4	3.2	3.8
25% or more	26.1	3.0	3.7
Special Education Students			
Less than 3%	17.4	2.4	2.5
3% - <10%	44.3	3.7	4.4
10% or more	38.3	2.8	3.4
Limited English Proficient Children			
0%	9.3	3.3	3.7
>0% - <5%	69.4	2.8	3.4
5% or more	21.3	3.9	4.5
Minority Enrollment			
Less than 5%	21.9	3.1	3.5
5% - <20%	26.5	3.2	3.8
20% - <50%	25.7	3.2	3.8
50% or more	25.9	3.5	4.1
School-Age At-Risk Children			
Less than 3%	45.5	3.5	4.1
3% - <5%	15.5	3.0	3.6
5% or more	39.0	3.1	3.8
Expenditures per Student			
Less than $4,000	21.3	2.7	3.2
$4,000 - <$6,000	55.6	3.4	4.1
$6,000 or more	23.1	2.7	3.3

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Table B7.2.-- Standard deviations of actual and student-need-adjusted student/teacher ratios by community characteristics

Community Characteristics	Percentage of Enrollment	Student/Teacher Ratios	
		Actual	Student-Need-Adjusted
TOTAL (N=39,783,948)	3.3	4.0	
Metropolitan Status			
Urban/central cities	26.7	3.1	3.7
Suburban/metropolitan	47.4	3.6	4.2
Rural	25.9	2.8	3.4
Geographic Region			
Northeast	16.9	2.6	3.3
Midwest	24.6	2.6	2.8
South	36.4	1.8	2.4
West	22.1	3.1	3.5
Median Household Income (actual)			
Less than $20,000	10.2	2.4	3.0
$20,000 - <$25,000	21.2	2.7	3.5
$25,000 - <$30,000	25.3	2.6	3.2
$30,000 - <$35,000	16.0	3.6	4.4
$35,000 or more	27.2	4.0	4.7
Median Household Income (cost-adjusted)			
Less than $20,000	10.0	2.7	3.4
$20,000 - <$25,000	27.7	3.1	3.8
$25,000 - <$30,000	25.9	3.2	3.9
$30,000 - <$35,000	15.9	3.5	4.2
$35,000 or more	20.5	3.6	4.2
Median Value Owner-Occupied Housing			
Less than $40,000	10.9	2.6	3.2
$40,000 - <$55,000	20.3	2.3	2.9
$55,000 - <$85,000	32.6	2.6	3.2
$85,000 or more	36.2	4.1	4.9
Education Attainment of Householders			
Less than 65% high school graduates	18.1	2.9	3.7
65% - <75% high school graduates	31.2	3.0	3.7
75% - <85% high school graduates	31.2	3.4	4.0
85% or more high school graduates	19.5	3.7	4.4
Population in Poverty			
Less than 5%	15.8	3.4	3.9
5% - <15%	47.7	3.3	4.0
15% - <25%	29.1	3.1	3.9
25% or more	7.4	2.6	3.2

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).
NOTE: All results are weighted by district enrollment. Percentages may not add to 100 due to rounding and missing categorization information for some observations.

Appendix C

Number of Districts in Each Characteristic Category

Table C1.1-- Total number of districts in each district characteristic category

District Characteristics	Number of Districts
TOTAL DISTRICTS (N=14,685)	
District Enrollment	
0 - 999	7,667
1,000 - 4,999	5,427
5,000 - 9,999	935
10,000 or more	656
District Type	
Elementary	946
Secondary	556
Unified	13,183
School-Age Children in Poverty	
Less than 5%	2,340
5% - <15%	5,343
15% - <25%	3,882
25% or more	3,120
Special Education Students	
Less than 3%	3,355
3% - <10%	5,293
10% or more	6,037
Limited English Proficient Children	
0%	6,400
>0% - <5%	6,870
5% or more	1,415
Minority Enrollment	
Less than 5%	7,147
5% - <20%	4,033
20% - <50%	2,163
50% or more	1,337
School-Age At-Risk Children	
Less than 3%	9,584
3% - <5%	1,849
5% or more	3,252

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).

Table C1.2-- Total number of districts in each community characteristic category

Community Characteristics	Number of Districts
TOTAL (N=14,685)	
Metropolitan Status	
Urban/central cities	557
Suburban/metropolitan	5,346
Rural	8,782
Geographic Region	
Northeast	2,810
Midwest	5,723
South	3,319
West	2,833
Median Household Income (actual)	
Less than $20,000	3,103
$20,000 - <$25,000	3,944
$25,000 - <$30,000	2,875
$30,000 - <$35,000	1,788
$35,000 or more	2,975
Median Household Income (cost-adjusted)	
Less than $20,000	2,476
$20,000 - <$25,000	4,131
$25,000 - <$30,000	3,540
$30,000 - <$35,000	2,176
$35,000 or more	2,362
Median Value Owner-Occupied Housing	
Less than $40,000	4,826
$40,000 - <$55,000	3,318
$55,000 - <$85,000	3,279
$85,000 or more	3,262
Education Attainment of Householders	
Less than 65% high school graduates	3,764
65% - <75% high school graduates	4,486
75% - <85% high school graduates	4,284
85% or more high school graduates	2,151
Population in Poverty	
Less than 5%	2,492
5% - <15%	7,041
15% - <25%	3,636
25% or more	1,516

SOURCE: Bureau of the Census, 1990 Census of Governments, Survey of Local Government Finances; U.S. Department of Education, National Center for Education Statistics, 1989-90 Common Core of Data, 1990 Census School District Special Tabulation (summary file set I).

Appendix D

Technical Notes on Data

- Data Sources
- Selection of Observations
- Procedures for Calculating State Payments Made on Behalf of School Districts
- Imputation Procedures
- Construction of Key Revenue and Expenditure Categories
- Resource-Cost Adjustments
- Student-Need Adjustments
- Dispersion Measures
- Categorization Breakpoints
- Standard Errors

Data Sources

Financial information for school districts was based on the 1990 Survey of Local Government Finances, commonly known as the F-33. This data collection effort was jointly conducted by NCES and the U.S. Bureau of the Census (Governments Division) for all public school districts in the country. These data permit the assessment of revenue and expenditure equity for school districts within states, as well as across the nation. For district and community information, district and school-level data files of the 1989-1990 Common Core of Data (CCD), and the 1990 Census School District Special Tabulation, commonly known as the census mapping file, were used. All three of these data files were intended to include the universe of public school districts, but the census mapping file has a number of missing districts in certain states. Information for missing districts was imputed (see Imputation Procedures in this appendix).

Selection of Observations

After merging the F-33, CCD District, CCD school summed to district, and census mapping files, school districts were dropped from the data set if they provided specialized or solely administrative services, were missing data, or were outlyers. Observations were deleted if any of the characteristics listed below were present. (There were a total of 17,418 observations. The number of observations remaining after each deletion is shown in brackets.)

- Were designated as vocational, special education, college grades, nonoperating, or education services agencies (school-level code from F-33) [16,194];
- Had zero or missing enrollment (fall enrollment for October 1989 from F-33) [15,008];
- Had zero or missing total revenue and total expenditure (total revenue and total expenditure from F-33) [15,007];
- Had the strings "VOC," "TECH," "VOC TECH," "SPEC ED," "SPECIAL ED," or "AGRIC" in the name of the district (LEA name from CCD District and F-33) [14,960];
- Had over 50 percent special education students (special education students from CCD District and fall enrollment from F-33) [14,918];
- Were supervisory union administrative centers, regional education services agencies, state-operated agencies, federally operated agencies, or other agencies that cannot be appropriately classified using another CCD designation (type code from CCD District) [14,811];

- Had per student expenditures that were less than the 0.5 percentile or greater than the 99.5 percentile, with the exception of districts with expenditure levels known to be accurate (total expenditures and enrollment from F-33) [14,661].[1]

Procedures for Calculating State Payments Made on Behalf of School Districts

Based on information received from the Governments Division Branch Chief at the Census Bureau and NCES, the following procedures were performed to allocate state on-behalf-of-LEA revenues to districts. These procedures include allocation to the separate on-behalf-of-LEA expenditure categories of C_J13 (Expenditures on-behalf-of-LEA - Instruction), C_J15 (Expenditures on-behalf-of-LEA - Support Services), and C_J10 (Expenditures on-behalf-of-LEA - Other current).

For states with district totals of zero in on-behalf-of-LEA revenues *and* expenditures fields, district current expenditures in the three categories of instruction, support, and other current expenditures were used as a percentage of total state current expenditures of each of these three to determine three separate on-behalf-of-LEA expenditure estimates of "Expenditures - on-behalf-of-LEA - Instruction," "Expenditures - on-behalf-of-LEA - Support," and "Expenditures - on-behalf-of-LEA - Other current" for each district. For districts that reported less on-behalf-of-LEA revenues than the state reported it gave, the additional revenues were allocated to districts in that state which did not report on-behalf-of-LEA revenues and expenditures. In cases in which districts reported less on-behalf-of-LEA revenues than the state reported it gave *and* all districts in that state reported on-behalf-of-LEA revenues or expenditures, the difference was added to existing values in on-behalf-of-LEA revenues and expenditures categories for each district, using the procedures below (and in these cases the C_J10, C_J13, and C_J15 are relevant).

Although districts in Montana reported on-behalf-of-LEA revenues, state reports indicated zero revenues were allocated for this fund. Following the Census Bureau's suggestion, districts that reported on-behalf-of-LEA revenues were changed to zero.

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[1] The data were modified in this way to exclude extreme values that seemed implausible. Even after deleting high cost special and vocational education districts, expenditures per student were still as high as $53,588 and as low as $1,499. Thus, the 0.5 and 99.5 percentiles were chosen as cut-off points with the observations thought to be erroneous deleted from the analysis. The average expenditures per student at these points are $2,462 and $17,742, respectively. Twenty-four of the 75 observations that were greater than the 99.5 percentile were added back to the data set because they were districts in Alaska and New York, and these extremely high expenditures per student were known to be accurate in these states.

The three current expenditure variables were constructed as shown below.

Instruction includes:
Instruction Expenditures
and if applicable:
Elementary/Secondary Retirement Fund Transfer - Own System
Expenditures on-behalf-of-LEA - Instruction

Support includes:
Instructional Staff Expenditures
General Administration Support Services Expenditures
School Administration Support Services Expenditures
Support Services, Unspecified Pupil Expenditures
Support Services, Pupil Expenditures
All Other Support Services Expenditures
and if applicable:
Elementary/Secondary Retirement Fund Transfer - Support Services
Elementary/Secondary Expenditures on-behalf-of-LEA - Support Services

Other current includes:
Food Service
Expenditures on-behalf-of-LEA - other current

The following procedures were used to assign district values:

District on-behalf-of-LEA instruction expenditure =

$$\frac{\text{Instruction expenditure of district}}{\text{Instruction expenditure of state}} \times \text{On-behalf-of-LEA instruction expenditure of state}$$

District on-behalf-of-LEA support services expenditure =

$$\frac{\text{Instruction expenditure of district}}{\text{Instruction expenditure of state}} \times \text{On-behalf-of-LEA support services expenditure of state}$$

District on-behalf-of-LEA noninstruction =

$$\frac{\text{Current other expenditure of district}}{\text{Current other expenditure of state}} \times \text{On-behalf-of-LEA current other expenditure of state}$$

District on-behalf-of-LEA total expenditure =

District on-behalf-of-LEA instruction expenditure +
District on-behalf-of-LEA support services expenditure +
District on-behalf-of-LEA other current expenditure

District on-behalf-of-LEA total revenue =

District on-behalf-of-LEA total expenditure

Imputation Procedures

The number of students in a district who were classified into various ethnicity categories and as special education students was missing for some school districts. In those cases, it was imputed either from other years' percentages of students in these categories, or, in a few cases in which information from other years was unavailable, from percentages in similar school districts.

The numbers were imputed using AIR's hot deck procedure, PROC IMPUTE. PROC IMPUTE selects the best method of differentiating school districts for the purpose of imputing ethnicity and special education category counts and selects a value from the distribution of values for similar districts. For example, for the 1989-90 special education percentage, determination of similar districts was based primarily on a weighted average of the percentages for 1988-89 and 1990-91. (Log number of ungraded students, the highest grade in the district, and metro status also entered into the similarity measure with small weights.)

For special education counts, there was one state in which a large percentage of cases had neither 1988-89 data nor 1990-91 data. However, in that state there were data for most districts in 1991-92, and 1991-92 data were used in the imputation of both 1988-89 percentages and 1990-91 percentages. Therefore, there was no state in which the majority of 1989-90 special education percentages were imputed without benefit of data on the percentages from some other year.

Overall, 1989-90 special education percentages were imputed for 1,793 districts, 12 percent of all districts. The mean percentage of special education students in districts that reported data was 9.8 percent, and the mean for imputed values was 7.8 percent. The

standard deviation of imputed values was 6.8 percent, compared to 9.2 percent for reported values, once reported values greater than 100 percent were trimmed. The slightly smaller means and standard deviations reflect the fact that districts similar to those with missing special education data reported lower and less varying special education counts than other districts.

Three measures of children in poverty, children with limited English proficiency, and children at risk; and four household measures of income, value of owner-occupied housing, poverty, and education attainment were used in this report. These measures were computed from several dozen variables contained in the Census Mapping (CM) data base. All of the measures actually used in the report were averages, medians, or percentages.

The Census Mapping data were missing for approximately 350 of the nation's 16,000 school districts, including approximately 250 in northern California. Although no tables in the report refer to state-by-state breakdowns, it was preferable to include those 350 districts in the aggregate figures tabulated. To do this, it was necessary to impute averages, percentages, and medians of the seven children and household measures derived from Census Mapping variables for those 350 districts. AIR did this with a simple hot deck imputation procedure, described below.[2]

A merged CCD/F-33/CM file was created for the expenditure report analyses. This file was sorted in a manner that places districts likely to be similar to one another on the CM variables, and for each record with missing CM data, the values of variables from the preceding case with data were inserted.

The imputed variables relate to language background, ethnicity, and wealth. Therefore, the merged CCD/F-33/CM file was sorted on CCD wealth and ethnicity measures. In particular, the percentage of students who are free lunch eligible, the percentage of students who are Hispanic, and the percentage of students who are minority were used as sort variables. Each of these percentages were blocked in 5-percent intervals. Within these blocks, districts were sorted on the three-level CCD locale code. Finally, districts were sorted by total enrollment within each combination of sort variables.

To avoid odd imputations that might result from the lexicographic ordering of the cases, if the first case of several within a combination of the four sort variables is missing data, it received data from the following case, rather than from the preceding case. If the only case within a combination was missing data, it received data from either the preceding or following case, depending on which was more similar on the sort variables.

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[2] Where county-level information was available, imputation was not necessary when county and district lines were coterminous. Beyond this, county-level data were not used in the imputation process to preserve variability among districts in a county.

Construction of Key Revenue and Expenditure Categories

The revenue and expenditure categories used in tables were constructed from F-33 variables as shown below:

Total Expenditures included:

E13 Instruction expenditures
E17 Support services, pupil expenditures
E07 Support services, instructional staff expenditures
E08 Support services, general administration expenditures
E09 Support services, school administration expenditures
E27 Support services, all other expenditures
E11 Gross school lunch expenditures
E10 All other (enterprise operations, community service operations, adult education)
E15 Support Services, unspecified
F12 Capital outlay, construction
G15 Capital outlay, land and existing structures
K12 Capital outlay, new and replacement equipment
J10 Expenditures, on-behalf-of-LEA, other current
J11 School retirement fund transfer
J12 School retirement fund transfer, own system
J13 Expenditures, on-behalf-of-LEA, instruction
J15 Expenditures, on-behalf-of-LEA, support services
L12 Payments to state government
M12 Payments to local governments
I86 Interest on Debt
Q11 Interschool transfer

Current Expenditures included:

E13 Instruction expenditures
E17 Support services, pupil expenditures
E07 Support services, instructional staff expenditures
E08 Support services, general administration expenditures
E09 Support services, school administration expenditures
E15 Support Services, unspecified
E27 Support services, all other expenditures
E11 Gross school lunch expenditures
J10 Expenditures, on-behalf-of-LEA, other current
J11 School retirement fund transfer
J12 School retirement fund transfer, own system
J13 Expenditures, on-behalf-of-LEA, instruction
J15 Expenditures, on-behalf-of-LEA, support services

Core Expenditures included:

E13 Instruction expenditures
E17 Support services, pupil expenditures
E07 Support services, instructional staff expenditures
E15 Support Services, unspecified
E27 Support services, all other expenditures
J10 Expenditures, on-behalf-of-LEA, other current
J11 School retirement fund transfer
J12 School retirement fund transfer, own system
J13 Expenditures, on-behalf-of-LEA, instruction
J15 Expenditures, on-behalf-of-LEA, support services

Total Revenue Included:

T06 Property tax
T09 General sales or gross receipts tax
T15 Public utility taxes
T40 Individual and corporate net income taxes
T99 All Other Taxes
T02 Parent government contributions
D11 Revenue from other school systems
D23 Revenue for other school systems
A10 Tuition and transportation feeds from pupil and parents
U22 Interest Earnings
A09 Gross receipts from school lunch sales
A12 Other sales and service revenue (student activities, revenue from community services, textbook sales and rentals)
U97 Misceilaneous other local revenue (rentals, contributions and donations from private sources, gains or losses on sale of fixed assets, miscellaneous)
C23 Revenue from state sources
C24 Census considered state revenue/NCES considered local revenue
C25 Federal Child Nutrition Act revenues
C26 All other federal aid through state
C27 Total State Payments on behalf of school district
B23 Federal Government Revenue for Elementary and Secondary Education
B26 Other Federal Government Revenue Received

Total Revenue from Local Sources included:

T06 Property tax
T09 General sales or gross receipts tax
T15 Public utility taxes
T40 Individual and corporate net income taxes
T99 All Other Taxes
T02 Parent government contributions
D11 Revenue from other school systems
D23 Revenue for other school systems
A10 Tuition and transportation feeds from pupil and parents
U22 Interest Earnings
A09 Gross receipts from school lunch sales
A12 Other sales and service revenue (student activities, revenue from community services, textbook sales and rentals)
U97 Miscellaneous other local revenue (rentals, contributions and donations from private sources, gains or losses on sale of fixed assets, miscellaneous)
C24 Census considered state revenue/NCES considered local revenue

Total Revenue from State Sources included:

C23 Revenue from state sources
C27 Total State Payments on behalf of school district

Total Revenue for Federal Sources included:

C25 Federal Child Nutrition Act revenues
C26 All other federal aid through state
B23 Federal Government Revenue for Elementary and Secondary Education
B26 Other Federal Government Revenue Received

Resource-Cost Adjustments

To allow analyses of fiscal measures to be meaningful in a comparative sense, a set of indices for adjusting revenues and expenditures for resource-cost differences *across districts* was incorporated. Cost-adjusted data are especially important in making national comparisons because the nominal dollar amounts for districts are of much less interest than what they represent in the form of real purchasing power. When comparable expenditures for education services are reported, comparable power to purchase education goods and services is assumed. Because of locational cost differentials, however, identical expenditures may *not* have the same purchasing power in different districts. To allow meaningful comparisons of revenues and expenditures per student across districts, it is important to convert these nominal amounts (actual dollars) into amounts that reflect real purchasing power (cost-adjusted dollars).

Although the concept of adjusting for cost differentials in making comparisons in expenditures and revenues across regions is generally accepted, the most appropriate set of adjustments to be used for these purposes has yet to be fully agreed upon or developed. For this reason, and to allow the reader to ascertain the impact of the cost adjustments to the actual data, actual and cost-adjusted revenue and expenditure information are presented together throughout this report.

The resource-cost adjustments used in this report are based on a set of unique cost-of-living indices calculated by McMahon and Chang (1991) for large cities, metropolitan areas, and nonmetropolitan areas across all of the states. These indices were derived from a regression analysis of the relationship between the cost-of-living and per capita personal income, housing value, and percentage change in population. (The Cost of Living Index table that follows was reproduced from their 1991 report.) Thus, in the absence of cost-of-education measures, the McMahon and Chang measures were used to produce alternative sets of expenditure and revenue values to accompany the actual values.

These cost-of-living indices were attached to individual districts through the use of the MSA and metro status codes for school districts from the 1989-90 CCD district file. These geographic codes and categories are assigned by the Office of Management and Budget (OMB), for the purpose of linking school districts to their respective *area components* of metropolitan statistical areas. The metro status code indicates the extent to which a district primarily serves a central city, and the MSA code further identifies the specific city being served.

In assigning cost-of-living indices to specific cities, a district was assigned to the nonmetropolitan cost of living index for its state when the metro status code indicated that it did not serve an MSA. When the metro status code indicated that a district served an MSA, that district was assigned the generic MSA index for its state unless its MSA code associated it with one of the large cities listed in the table, in which case it was assigned the index for that particular large city.

An issue associated with the use of the McMahon and Chang indices included in this report is the relative lack of detail. For the majority of the states, only two indices were provided, metropolitan and nonmetropolitan areas. This level of aggregation masks a great deal of district-level variation and would seem to be of especially questionable use in analyses within individual states. However, more detail was provided for the most populous states. For example, seven indices were calculated for California with unique indices provided for each of the five large cities (population greater than 1.5 million). This level of detail is considered to be sufficient for use in this analysis of the full universe of districts across the nation. It is also considered to be a place holder for introducing the concept of resource-cost adjustments until more appropriate and detailed indices are made available for these purposes.

The most appropriate form of cost adjustment to be used with the F-33 fiscal data would be based on measures of variation in the cost of *education* resources in different locations throughout the country. Although work on the development of such cost-of-education differentials has been investigated by NCES, this type of cost-adjustment factor is not currently available for use in this report. Lacking cost adjustments based on differences in the cost of *education*, a second option is to base the cost factors to be used in this report on differences in cost of *living* within states and across the nation. Although less preferable than cost-of-education measures, it has been shown that variations in the cost of living are highly correlated with differences in the cost of education (Chambers 1981; Chambers et al. 1993).

Cost of Living Index, 1989
For Large Cities, Metropolitan Areas, and Nonmetropolitan Areas

STATE	Large City (Pop > 1.5m)	MSA's (1.5m - 50,000)	Nonmetropolitan (Pop < 50,000)
Alabama		96.02	94.90*
Alaska		127.60	137.10
Arizona		101.15	100.43
Arkansas		96.30	93.10
California		118.75	99.25*
Anaheim-Santa Ana	130.90		
Los Angeles-Long Beach	129.20		
Riverside-San Bernardino	110.36		
San Francisco	151.84 b		
San Jose	129.90		
Colorado		99.63	93.45
Denver	102.10		
Connecticut		131.75	99.33*
Delaware		112.85 c	102.80
District of Columbia		125.50*	
Florida		101.08	97.20
Miami-Hialeah	113.50		
Georgia		98.95 c	98.30
Hawaii		132.50*	132.50
Idaho		96.10	92.75
Illinois		105.56	97.35
Chicago	120.10 b		
Indiana		96.77	95.46 c
Iowa		96.50	95.95
Kansas		98.85	89.80
Kentucky		95.97	91.20
Louisiana		98.80	93.45*
Maine		104.00*	99.30*
Maryland		108.30	101.80*
Massachusetts		120.25	99.30*
Michigan		106.93	103.50
Detroit	117.63 b		
Minnesota		100.03	95.23*
Mississippi		96.02 a	93.30

* Data is not available, so the index uses data from an adjacent state (or city).

a. Data is the same as Alabama, because there are no MSA's in Mississippi.

b. COL predicted using regression equation based on BLS sample, as explained in McMahon (1991). It uses data on housing values, per capita personal income, and population change specific to each large city. The resulting prediction for each city indicated (b) is before normalization to a statewide base of 100. To accomplish this adjustment, a regression equation was computed in each case for a neighboring city that does have ACCRA data, and the ratio of the BLS based prediction to the ACCRA estimate in the neighboring city is used to "normalize" the BLS-equation predictions to the same base.

c. The data presented by ACCRA data is incomplete and is not representative, or is missing, so the regional index for the respective MSA's or nonmetropolitan areas is used.

d. For Nevada MSA's and nonmetropolitan areas respectively, 1989 and 1990 ACCRA data is pooled.

Cost of Living Index, 1989 (cont.)
For Large Cities, Metropolitan Areas, and Nonmetropolitan Areas

STATE	Large City (Pop > 1.5m)	MSA's (1.5m - 50,000)	Nonmetropolitan (Pop < 50,000)
Missouri		94.45	88.95
Montana		95.61 *	93.86 *
Nebraska		92.45	89.33
Nevada		106.87 d	104.40 d
New Hampshire		122.30	99.33 *
New Jersey		122.05 c	122.05 c
Newark	122.05 c		
New Mexico		100.85	98.06
New York		105.82	99.50 c
Nassau-Suffolk	137.73 b		
New York	131.48 b		
North Carolina		99.19	96.80
North Dakota		98.60	95.23
Ohio		98.29	96.07
Cleveland	111.94 b		
Oklahoma		93.75	87.00
Oregon		99.00	94.90
Pennsylvania		104.60	99.50
Philadelphia	129.20		
Pittsburgh	106.10		
Rhode Island		103.96 *	99.33 *
South Carolina		96.40	92.70
South Dakota		96.90	94.95
Tennessee		95.30	92.93
Texas		95.89	94.05
Dallas	104.20		
Houston	99.10		
Utah		92.10	90.80
Vermont		103.96 *	99.33 *
Virginia		113.27	101.80
Washington		97.42	92.70
Seattle	113.20		
West Virginia		93.87	92.07 *
Wisconsin		99.80	96.10
Wyoming		95.61 c	93.86 c

* Data is not available, so the index uses data from an adjacent state (or city).
a. Data is the same as Alabama, because there are no MSA's in Mississippi.
b. COL predicted using regression equation based on BLS sample, as explained in McMahon (1991). It uses data on housing values, per capita personal income, and population change specific to each large city. The resulting prediction for each city indicated (b) is before normalization to a statewide base of 100. To accomplish this adjustment, a regression equation was computed in each case for a neighboring city that does have ACCRA data, and the ratio of the BLS based prediction to the ACCRA estimate in the neighboring city is used to "normalize" the BLS-equation predictions to the same base.
c. The data presented by ACCRA data is incomplete and is not representative, or is missing, so the regional index for the respective MSA's or nonmetropolitan areas is used.
d. For Nevada MSA's and nonmetropolitan areas respectively, 1989 and 1990 ACCRA data is pooled.

Student-Need Adjustments

To account for variations in the education needs of students in districts and to ensure that data can be compared in meaningful ways, education resource values were adjusted by student need. The three most prevalent categorical funding sources in recognition of these student-need variations are special education, compensatory education, and limited English proficient (LEP) students. Because of these categorical funding sources and because of the clearly acknowledged higher cost of serving these categories of students, meaningful resource allocation distinctions cannot really be made across districts without somehow taking into account variations in these student populations. For example, equal revenues across districts that appear to be perfectly equitable, may, in fact, be quite inequitable if these districts enroll different populations of special need students. This issue is equally important, if not more so, than the resource-cost adjustments; and, due to the lack of relevant data, will be even more difficult to ascertain with precision. However, because of their importance to this analysis, we have made the best effort to account for the effects of these variations using results from a limited number of studies that have addressed this issue.

The weightings used for the student-need adjustments for special education were based on the best available information found regarding the average, marginal costs of providing additional services to meet the needs of these exceptional need populations. Of course, the use of a single cost factor masks the considerable variations in the cost of providing different types of interventions to different types of students within each special needs category. Lacking counts of service configuration by district, single average cost factors were applied to counts of special needs students by district.

A single multiplier for special education, produced by Moore et al. (1988), based on data from a nationally representative sample, is 2.3. This multiplier reflects the finding that the average cost of serving a special education student was 2.3 times the cost of serving regular education students for the 1985-86 school year. This special education weight is fairly well established over years of research on this issue, and it has not varied a great deal across alternative special education cost studies (Chaikind, Danielson, and Brauen 1993).

For children in poverty, the best estimate for a single multiplier may be based on the average federal Chapter 1 allocation for a school year. As many states also have compensatory education supplemental allocations for students in poverty, this multiplier will actually understate the actual average adjustment received by students in poverty across the nation. However, this readily available and well-understood indicator may be the best, currently available, basis for determining a weighting for students in poverty. Based on total average revenues per student for 1987 and the average Chapter 1 allocation per student, the resultant weighting for students in poverty is 1.2 (Levin 1989).

Cost estimates for LEP students are even more problematic. The most carefully derived cost estimate that we are aware of is based on a cost analysis of alternative programs for LEP students in California, which is summarized in a paper by Parrish (1994). Although based on a purposive sample of districts and restricted to California, these data may provide the best estimate available of the marginal cost of serving students with limited English proficiency. Based on these data, the estimated multiplier of the excess cost of serving LEP students is 1.08 ($4,598 average expenditures per student in California as compared to the estimated supplemental cost of serving LEP students in this subset of California districts of $361.) Because this study was based on a very limited sample and very little information on the cost of instructional services for LEP students is available, a multiplier of student weight of 1.2 was used for LEP students. This was selected for lack of a better number and because there is no reason that special services for LEP students would be less costly than for students in poverty.

The student weights used in this study are certainly open to challenge and could easily be replace by alternatives. This is especially true of the students in poverty and LEP weights. For example, one alternative would be to increase the poverty weight from 1.2 to 1.4 to reflect the authorized, rather than the actual, Chapter 1 grant. The weights used in this study should be viewed as place holders until better program cost estimates are derived.

Compensatory education student-need adjustments were applied to districts based on the percentages of children living in households where English is not the spoken language and who speak English "not well" or "not at all," and the percentage of children in poverty which were derived from the Census Mapping database. The enrollment count of each district in the F-33 was multiplied by these percentages to determine the counts of compensatory education students. These students were given an enrollment weight of 1.2. The CCD database contained counts of special education students; these were given an enrollment weight of 2.3.

Dispersion Measures

Broad interest in comparing expenditures has led to several questions about how variation in expenditures per student should be measured. For example, should the degree of variation existing within a state simply be expressed as the size of the gap between the highest and lowest spending districts? Or should a measure of variation omit some of the more extreme values and look at the expenditure gap between districts at some specified percentiles (e.g., the degree of difference between districts at the 5th and 95th percentiles)?

Relative variation, or dispersion, in education expenditures per student can be measured in a variety of ways. Each of these alternatives focuses on a unique aspect of the distribution of expenditures across a state, and each presents a somewhat different picture regarding the relative equity of the state allocation system. For this reason, six alternative measures of dispersion are commonly used in conducting such equity analyses (Berne and

Stiefel 1984). Descriptions of each of these measures—range, restricted range, federal range ratio, McLoone Index, coefficient of variation, and the Gini coefficient—follow:

The range is the difference between the highest and lowest districts. Of all the measures, the range is perhaps the easiest to understand and most widely used, but it is subject to the influence of an exceptional case and does not accurately represent the variations in resources among all districts.

The restricted range is the difference between the values at the 95th and 5th percentiles. Thus, in a state with 500 districts, it would be the value for the 25th ranking district, minus the value for the 475th ranking district. This measure is much less likely to be sensitive to a few exceptional cases.

The federal range ratio, which is the restricted range divided by the value at the 5th percentile, indicates how many times greater the resources are at the high end of the distribution than at the low end.

The McLoone Index is used to assess equity in the distribution of resources among students in the lower half of the spending distribution. It compares the total amount spent for all students below the median with a calculation of what would have to be spent to bring them up to the median level of revenues. The closer this value is to 1, the less dispersion there is among students in low spending districts (Picus and Toenjes 1994).

The coefficient of variation is 100 times the standard deviation divided by the mean (i.e., the standard deviation as a percentage of the mean). In contrast to the three range measures, it takes into account all observations. It roughly indicates the percentage above and below the mean within which two-thirds of the observations lie. The coefficient of variation can take on any positive value, with zero indicating perfect equity.

The Gini coefficient is based on the Lorenz curve, which shows the cumulative proportion of the aggregated value of a variable plotted against the cumulative proportion of districts, when districts are ranked in ascending order by the variable. If the variable has the same value in every district, the Lorenz curve is a straight line, with a positive 45-degree slope. If the variable is not equally distributed across districts, the curve will "sag." The Gini coefficient is the area between the Lorenz curve and the 45-degree line, expressed as a fraction of the total area below the 45-degree line. This coefficient ranges from 0 to 1, with 0 indicating perfect equity.

Equity and equality. Distinctions between equity and equality are central to the formation of public education fiscal policy. Equity issues focus on the fairness of the overall public education allocation system. Given our decentralized system of public education, more public dollars will inevitably be spent on the education of some school children as opposed to others. In fact, even if there were perfect equality in terms of the number of dollars received per student, because of the resource-cost and student-need differentials that

are known to exist across districts, equal dollars for all students would not result in equal education opportunities. Thus, major policy questions in relation to equity and equality standards pertain to when expenditure differentials are warranted and to what degree.

These issues are magnified by the fact that all public education funding formulas allocate different amounts of revenue to districts to account for the differing educati n needs of some types of students (e.g., special education). This raises questions about the kinds of students who should be eligible for supplemental aid and the most appropriate size for these supplements. These types of vertical equity questions further complicate issues related to the relationship between equity and equality in the formation of fiscal policies governing public education.

The types of dispersion measures described above are fairly simplistic in their orientation, as they simply equate education equity with resource equality. For this reason, they are almost always used in a comparative context because it is difficult to know what meaning to attribute to the results when they stand alone. It is generally recognized that perfect equality in education expenditures may not be equitable in other terms (Toenjes 1994; Odden 1992; Wyckoff 1992; Riddle 1990; Berne and Stiefel 1983). For example, because it is known that resource costs vary across districts and it is recognized that some categories of students require additional resources (vertical equity), some degree of expenditure variation may be warranted.

This leaves us with the question of how near to equal expenditures must be in order to be equitable. Because resource-cost and student-need adjustments have been incorporated into the fully adjusted cost estimates for this study—to the extent that these adjustments are appropriate—some may argue that, for these data, perfect equality equals perfect equity. Unfortunately, the adjustments that have been used are not fully agreed upon across the education research and policy community, nor are they fully comprehensive. For example, no attempt has been made to adjust for diseconomies of scale. Very small schools are known to have higher costs for this reason, but most people would disagree with allocating more revenues to very small schools to cover these inefficiencies, unless the schools are necessarily small (i.e., located in remote regions). Thus, even with fully adjusted expenditures, the question remains as to what degree of equality in expenditures constitutes equity within the system.

For these reasons it is difficult to say what degree of expenditure variation within a state should be tolerated and considered equitable. Thus, dispersion data are almost always presented in comparison with something else. For example, dispersion measures in a given state can be compared over time to measure progress in achieving school finance equity. Or, states can be compared with one another using these types of measures. Berne and Stiefel (1992), for example, have ranked the states in relation to the relative equity of their public funding systems.

Utility of national dispersion data. The discussion above raises the question of the relative utility of dispersion measures for the nation. How can these measures be interpreted? Similar to the state context, national dispersion measures could be used to examine the degree of variation in public education resource allocations in the United States as compared to other countries, if such data were available. A second parallel to the uses within states is that these data could be collected and measured over time to assess national progress in reducing variations in distributions of public education resources.

Although at present the ability to interpret these data is limited, the presentation of national expenditure data in this form serves several purposes. First, these data demonstrate a method for combining horizontal and vertical equity considerations in making comparisons of education resource measures. Horizontal equity assumes that all students are equal and consequently should receive equal resources. A vertical equity standard reflects the belief that students with varying levels of identifiable education needs require varying levels of education resources. The combination of student-need weights, or adjustments, and resource-cost adjustments may provide an equity standard that can be more clearly defined and understood. For example, it could be argued that if the adjustments were sufficiently detailed and correct, perfect equity would result from equality of expenditures in adjusted terms. Whereas the adjustments may never become that precise, their use begins to clarify some ultimate equity objectives. Thus, although the adjustments used in this report may need refinement, they are the types of adjustments that should be made in assessing disparities of revenue and expenditures.

Second, these data establish a baseline against which future national dispersion measures can be compared. An ongoing assessment of whether equity gains in the allocation of public education resources are being made across the nation can begin with these data.

Third, these data provide a national perspective on the role played by state and federal funding provisions in promoting school finance equalization. For example, a comparison of the degree of variation found in state and local revenues combined in relation to local revenues alone could be used to measure the relative equalizing influence of state revenue sources across the nation.

Fourth, these data can be used to explore such national patterns as the degree of variation found in core instruction versus total resources. For example, it is sometimes argued that the observed variation in total public education expenditures overestimates any true differential in education opportunities. This argument contends that extra dollars often may be used to purchase nonessential items for schools and therefore that key instructional resources do not vary as much as total expenditures. These types of dispersion measures allow exploration of such questions using national data.

Last, the degree of dispersion observed in education resource allocations can be compared to measures of the dispersion of wealth across the nation. This provides a comparative basis for interpreting the degree of variation observed in the allocation of education resources. Do public education resources appear to be more equally allocated across the country than income or wealth in the form of housing values? Do these data provide evidence that allocations of resources for public education services have a levelling effect in society?

Categorization Breakpoints

For this report, categorization breakpoints were based on previous Department of Education publications. Categories for which no prior examples were found were broken as evenly as possible while still making logical breaks (e.g., 0-<5%, 5%-<10%, 10%-<15%, 15% or more). These types of breaks were preferable to quartile breaks, which are subject to change on a yearly basis. We also attempted to choose more logical breaks for ease of reader understanding.

Standard Errors

School district averages based on the 1990 Census were used to define certain row variables in the tables. These were the percentages of school-age children in poverty, limited English proficient children, school-age at-risk children, and population in poverty, median household income (actual and cost-adjusted), median value owner-occupied housing, and education attainment of householders. Census estimates were based on information available from only a sample of decennial census respondents, and therefore, these values are subject to sampling error. For small districts, this sampling error can be quite large. Therefore, the entries in the tables in this report should be interpreted as applicable to the MEASURED row variable for the subpopulation of districts, not to an underlying construct.

Multivariate Analyses

Because the various factors on which school districts differ are correlated with each other, (some, like enrollment size and urbanicity, highly correlated), it is impossible to discern from marginal averages which of several correlated variables are most responsible for a difference. By simultaneously allowing all of the descriptive factors under study to account for variation in the dependent variable (e.g., in per student expenditures), it is possible to identify which are the "real" factors and which only appear to be factors because of their correlation with the "real" factors. Conceptually, this is accomplished by finding out which of the factors is correlated with the dependent variable when the analysis is restricted to districts that are equal on the other factors. If a factor is correlated with the dependent variable, when districts are equal on comparable levels in respect to the other variables, then it is more likely to be a "real" factor; whereas, if its correlation with the dependent variable

evaporates when examining only districts that are equal on other factors, then that factor is only an apparent contributor to variance in the dependent variable.[3]

The method used for this analysis was the SAS program for the General Linear Model, PROC GLM. The model used was:

dependent variable = METRO_C, GEOREG_C, INCADJ_C, HOUSE_C, HSGRAD_C, DSTENR_C, DSTTYP_C, POVCHD_C, SPECED_C, LEP_C, MINENR_C, ATRSK_C

Where:

METRO_C = metropolitan status category
GEOREG_C = geographic region category
INCADJ_C = cost-adjusted median household income category
HOUSE_C = median value owner-occupied housing category
HSGRAD_C = education attainment of householders category
DSTENR_C = district enrollment category
DSTTYP_C = grade levels served category - elementary, secondary, or unified
POVCHD_C = school-age children in poverty category
SPECED_C = special education students category
LEP_C = limited English proficient children category
MINENR_C = minority enrollment category
ATRSK_C = school-age at-risk children category

In this model, each of the factors was treated as a categorical variable; that is, the model was essentially an analysis of variance model. Thus, unlike linear regression, no assumptions of linearity of relations were imposed. Based on the estimates produced by this analysis, it is possible to compute "least squares means" or "equated means," which present what the dependent variable means in the marginal cells would have been if the model had been applied to a population in which the factors were uncorrelated.

The multivariate analysis procedures used in these analyses were based on the "LSMEANS" computation provided by SAS. However, this procedure normally invokes an additional normalization of the population by displaying what the dependent variable means in marginal cells would have been if the factors were uncorrelated and if the distributions on the factors were all uniform (all cells of equal frequency). Because forcing uniformity of distributions of factors in this case actually distorts the results (e.g., it is not the case that there are equal numbers of urban, suburban, and rural districts), the "least squares means" presented in this report are *not* based on this uniform distribution model. Rather, they were

[3] It should be noted that the accuracy and meaningful interpretation of results from any type of analysis are limited by (1) the ability to correctly and fully specify the model, and (2) the availability of all needed data.

computed from the SAS program output by adding that constant to all least squares means which would equate the overall least squares mean to the overall raw mean. Thus, within each table and subtable, the average of the least squares means matches the average of the raw means, whenever the same cases were used in both analyses.

Appendix E

Definitions of Key Terms

Definitions of Key Terms

Capital outlay is direct expenditure for contract or force account construction of buildings, roads, and other improvement, and for purchases of equipment, land, and existing structures. This includes amounts for additions, replacements, and major alterations to fixed works and structures. However, expenditure for repairs to such works and structures is classified as current operation expenditure.

A **central city** is a city within a Metropolitan Statistical Area (MSA) with a minimum population of 50,000, and has a Census Urbanized Area Code.

The **coefficient of variation** is a statistical measure of dispersion. It is 100 times the standard deviation divided by the mean (i.e., the standard deviation as a percentage of the mean). It indicates the percentage above and below the mean within which two-thirds of the observations lie. The coefficient of variation can take on any positive value, with zero indicating perfect equity.

A **Consolidated Metropolitan Statistical Area (CMSA)** is an area of greater than 1,000,000 population. The totality of the PMSAs in a single geographical area.

Core instructional expenditures are current expenditures for instruction, student support services (health, attendance, guidance, and speech), and instructional staff support services (curricular development in-staff training and education media, including libraries). Excluded are school administration expenditures, general administration, business functions, operation and maintenance, student transportation, food service, enterprise, and community services operations. The use of the term "core" is designed to reflect the central purpose of the local education agency, which is to educate children. Some readers who philosophically differ with this interpretation may wish to add expenditures for student transportation, or food services, or school administration, if they believe these functions would be included in the central purpose of the local education agency.

Current operating expenditures are expenditures for the categories of instruction, support services, and noninstructional services for salaries, employee benefits, purchased services and supplies, and payments by the state made for or on behalf of school systems. This does not include expenditures for debt service and capital outlay, and property (i.e., equipment); or direct costs (e.g., Head Start, adult education, community colleges, etc.) and community services expenditures.

District Type is defined by the level of instruction provided. The categories and distinctions are:

- elementary - district provides instruction only below 8th grade.
- secondary - district provides instruction between 7th and 12th grades
- unified - district provides instruction for any other combination of grades.

An **education agency** is a government agency administratively responsible for providing public elementary and/or secondary instruction or education support services.

Education attainment is defined as the highest level of education attained. In this study it is measured by the percentage of householders with high school diplomas (or its equivalent) or higher education. Persons who reported completing the 12th grade but not receiving a diploma are not included.

Elementary is a general level of instruction classified by state and local practice as elementary, composed of any span of grades not above grade 8. Preschool or kindergarten is included only if it is an integral part of an elementary school or a regularly established school system.

Enrollment is defined as the count of students on the current roll on or about October 1, 1989.

The **federal range ratio** is a statistical measure of dispersion. It is the difference between the values at the 95th and 5th percentiles divided by the value at the 5th percentile. It indicates how many times greater the resources are at the high end of the distribution than at the low end.

A **federally operated agency** is any elementary, secondary, or combined education program operated by a federal agency (such as Bureau of Indian Affairs).

General administration and support refers to those expenditures for school and district administration and school lunch expenditures.

Geographic region refers to district location within a region of the country. The regional designators for this analysis are

- Northeast - ME, NH, VT, MA, RI, CT, NY, NJ, PA
- Midwest - OH, IN, IL, MI, MN, IA, MO, ND, SD, NE, KS, WI
- South - DE, MD, DC, VA, WV, NC, SC, GA, FL, KY, TN, AL, MS, AR, LA, OK, TX
- West - MT, ID, WY, CO, NM, AZ, UT, NV, WA, OR, CA, AK, HI

Individualized Educational Program (IEP), as used here, is defined as a written instructional plan for students with disabilities designated as special education students under IDEA-Part B.

Instructional expenditures are expenditures for activities dealing directly with the interaction between students and teachers (salaries, including sabbatical leave, employee benefits, purchased instructional services, and supplies).

Limited English Proficient (LEP) is defined as children 5 years and over living in households in which English is not the spoken language, who speak English "not well" or "not at all."

Median household income is defined as the 1989 median income of the householder and all other persons 15 years old and over in the household, whether related to the householder or not.

Median value owner-occupied housing is defined as the median value of specified owner-occupied housing units.

Metropolitan status is the classification of an education agency's service area relative to a Metropolitan Statistical Area. Categories and distinctions are:

- urban/central city - primarily inside a central city
- suburban/metropolitan - primarily outside a central city
- rural - nonurban area

A **Metropolitan Statistical Area (MSA)** is so defined if it is the only MSA in the immediate area and it has a city of at least 50,000 population; or if it is an urbanized area of at least 50,000 with a total metropolitan population of at least 100,000.

Minority enrollment refers to the number of students who are black, Hispanic, Asian, American Indian, and Alaskan native.

A **Non-MSA City** is a city or place not in an MSA with a minimum population of 25,000 inhabitants and a population density of at least 1,000 per square mile, and does not have a Census Urbanized Area Code.

Outside urbanized area is defined as an area not contiguous to any city or urban fringe area with a minimum population of 2,5000 inhabitants; an area with a population density of at least 1,000 per square mile, and without a Census Urbanized Area Code.

Other agency is defined as any elementary, secondary, or combined education program that cannot be appropriately classified using another CCD designation and that has been reported as such by the state's CCD Coordinator.

Other current expenditures are expenditures for food services, and expenditures on behalf of LEA for other current expenditures.

Population in poverty is defined as persons for whom poverty status was determined in 1989, living below poverty level. In this study it is measured by the percentage of persons in a school district below the poverty level.

A **Primary Metropolitan Statistics Area (PMSA)** is a Component of a CMSA Public School Institution which:

- provides education services;
- has one or more grade groups (PK-12) or is ungraded;
- has one or more teachers to give instruction;
- is located in one or more buildings;
- has an assigned administrator;
- receives public funds as primary support; and
- is operated by an education agency.

Regional education service agencies (RESA) are agencies that provide special services (such as regional vocational/technical or special education) to other public elementary and secondary education agencies.

A **regular school district** is an agency responsible for providing free public elementary and secondary education for school-age children residing within its jurisdiction. These agencies may include special and vocational education in a comprehensive education setting. In some cases, these education agencies contract with other agencies to provide services rather than operating schools themselves.

Revenues are defined as increases is the net current assets of a government fund type from other than expenditure refunds and residual equity transfers. These are reported as revenues from local, state, and federal sources.

Revenues from federal sources are direct grants-in-aid from the federal government; federal grants-in-aid through the state or an intermediate agency, and other revenue such as that received in lieu of taxes because the tax base was not subject to taxation.

Revenues from local sources are revenues from a local education agency, including local property and nonproperty tax revenues, local government, tuition, transportation, food services, student activities, donations, and property rentals.

Revenues from state sources are revenues from a state government source including those that can be used without restriction, those for categorical purposes, and revenues in lieu of taxation.

Revenues from State for/on Behalf of School Districts are revenues from payments made by a state for the benefit of the LEA or contributions of equipment or supplies. Such revenues include:

- the payment of a pension fund by the state on behalf of an LEA employee for services rendered to the LEA;
- contributions of fixed assets (property, plant, and equipment) such as school buses and textbooks.

Rural defines an area with 2,500 inhabitants or fewer; and/or a population density of less than 1,000 per square mile; and/or does not have a Census Urbanized Area Code.

A **school district** is a geographic area within a state where a public school system operates as a governmental entity with responsibility for operating public schools in that geographic area.

School-age at-risk children refer to children 6 to 19 years old living with mother, mother not high school graduate and single, divorced, or separated, and family income was below the poverty level in 1989.

School-age children in poverty is defined as children 5 years of age and over for whom poverty status was assigned in 1989.

Secondary is defined as the general level of instruction classified by state and local practice as secondary and composed of any span of grades beginning with the next grade following the elementary grades and ending with or below grade 12.

Special education students are students for which curriculum, materials, or instruction is adapted or for which special services are provided. This includes students with any of the following disabling conditions:

- hard of hearing,
- deaf,
- speech-impaired,
- health-impaired,
- orthopedically impaired,
- mentally retarded,
- seriously emotionally disturbed,
- multihandicapped, and
- deaf and blind.

A **state-operated agency** is a state-operated entity charged, at least in part, with providing elementary and/or secondary instruction or support services.

A **student** is an individual for whom instruction is provided in an elementary or secondary education program that is not an adult education program and is under the jurisdiction of a school, school system, or other education institution.

A **Supervisory Union** is an education agency where administrative services are performed for more than one school district, by a common superintendent.

Support Services Expenditures are expenditures for:

- student support services (attendance, guidance, health, speech, and psychological);
- staff support services (improvement of instruction and education media, including librarians);
- general administration (board of education and central office);
- school administration (principal);
- business (fiscal services, purchasing, warehousing, and printing);
- operation and plant maintenance;
- student transportation services; and
- central expenditures (research, information services, and data processing).

Student/teacher ratio is defined as the number of students in a district divided by the number of teachers in the district. The ratio represents an average across the district. While there is undoubtedly great variability across prekindergarten, elementary, and secondary grade levels, and across programs such as special education and gifted and talented, these distinctions are not presented.

Teachers are defined as individuals who provide instruction to prekindergarten, kindergarten, grades 1 through 12, or ungraded classes in a classroom or an environment other than a classroom setting.

Total Expenditures are defined as decreases in net financial resources for the purposes of public education. These consist of current, property, and facilities acquisition expenditures, and other current expenditures not directly related to pre-K through 12 programs. These "other current expenditures" are reported as community services and direct cost expenditures.

An **urbanized area** is defined as an area with a population concentration of at least 50,000; generally consisting of a central city and the surrounding, closely settled, contiguous territory and with a population density of at least 1,000 per square mile.

A **vocational education district** is defined as a public elementary/secondary district that focuses primarily on vocational education, and provides education and training in one or more semiskilled or technical occupations.

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