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ABSTRACT

In the Hawkins-Stafford Elementary and Secondary School Improvement Amendments of 1988, Congress directed the U.S. Department of Education (ED) to conduct a study of methods used to allocate federal elementary and secondary education grants among the states. This document, the final report on that study, assesses grant distribution funding formulas and the actual interstate distributions of federal aid and examines the rationales for, and effects of, numerous alternatives to the current fund allocation process. The study focuses on the larger ED formula-grant programs, such as Chapter 1 Grants to Local Education Agencies, Chapter 1 Migrant Education, Chapter 2 Block Grants, Mathematics and Science Education, Drug-Free Schools and Communities, Impact AID: Maintenance and Operations, Education of the Handicapped Act Basic and Preschool Grants, Chapter 1 Grants for the Handicapped, Vocational Education Basic State Grants, and Adult Education Grants to States. These programs distributed $8.7 billion in FY 1989--approximately 89 percent of that year's ED elementary-secondary education budget. Fund allocation formulas are generally based on indicators of need, fiscal capacity and effort factors, education costs indicators, and constraints on allocations. Funding formula alternatives involve consideration of poverty factors and other need indicators, adjustments for fiscal capacity, rewards for physical effort, adjustments for cost differentials, and changes in formula constraints. The discussion is accompanied by numerous charts of state-by-state comparisons. (Contains 29 references.) (MLH)

THE DISTRIBUTION OF FEDERAL ELEMENTARY-SECONDARY EDUCATION GRANTS AMONG THE STATES

Final Report on the Study Mandated by Congress in P.L. 100-297, Section 6207

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1991

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PREFACE AND ACKNOWLEDGMENTS

This is the final report called for by Congress in its mandate to the U.S. Department of Education (ED) in P.L. 100-297, Section 6207 to study the methods used to distribute federal funds for elementary and secondary education among the states. The interim report examines the existing fund allocation formulas, the actual distributions of federal education aid among the states (as of fiscal year 1989), and numerous alternatives to, or changes in, the existing methods of distributing federal aid.

The report has been prepared by Dr. Stephen M. Barro of SMB Economic Research, Inc., subcontractor to Westat, Inc., under a contract from the ED Planning and Evaluation Service (PES) in the Office of Policy and Planning. The prime contract was originally with Decision Resources Corporation, which has since been acquired by Westat. Several members of the Westat staff and the former DRC staff--Myron Schwartz, Gail Rothberg, Eric Ajmani, and Beth Sinclair--contributed to the study by assembling the data base, carrying out statistical analyses, and producing tables and figures for this document. Babette Gutmann served as DRC's and Westat's project manager. Priscilla Taylor edited the report.

This study has benefitted from the guidance of Alan L. Ginsburg, Director of ED Planning and Evaluation, and several members of his staff, including Valena White Plisko, Jerry Bushee, James English, and Stephanie Stullich. Tom Corwin of the ED Budget Service and his staff (notably Sandy Brown and Marilyn Hall) provided and helped to interpret the data on allocations of federal funds. William Sonnenberg of the National Center for Education Statistics (NCES) contributed data and valuable insights into the subtleties of the various fund allocation formulas. Helpful comments were provided by PES and several other offices within the Department.

All these contributions notwithstanding, the author remains solely responsible for all shortcomings of fact and interpretation and for the views expressed or implied in the report.

SUMMARY

In the Hawkins-Stafford Elementary and Secondary School Improvement Amendments of 1988 (P.L. 100-297, Sec. 6207), Congress directed the U.S. Department of Education (ED) to conduct a study of the methods used to allocate federal elementary and secondary education grants among the states. This document, the final report on that study, extends the analysis presented in an Interim Report in July 1990. In addition to assessing the formulas used currently to distribute funds under the major ED grant programs and the actual interstate distributions of federal aid, this final report examines the rationales for, and the effects of, numerous alternatives to the current fund allocation methods.

The study focuses on the larger ED formula-grant programs in elementary and secondary education (including vocational and adult education)--namely, the following 11 programs, all of which were funded at $100 million or more in fiscal year (FY) 1989:

Chapter 1 Grants to Local Educational Agencies (LEAs)
Chapter 1 Migrant Education
Chapter 2 Block Grants
Mathematics and Science Education
Drug-Free Schools and Communities
Impact Aid: Maintenance and Operations
Education of the Handicapped Act (EHA)--Basic Grants
Education of the Handicapped Act (EHA)--Preschool Grants
Chapter 1 Grants for the Handicapped
Vocational Education: Basic State Grants
Adult Education: Grants to States

In the aggregate, these programs distributed $8.7 billion in FY 1989--approximately 89 percent of that year's ED elementary-secondary education budget.

FUND ALLOCATION FORMULAS AND FORMULA DESIGN ISSUES

The formulas that control the distributions of federal education funds among states are generally very simple. Each allocates aid solely or primarily according to numbers of pupils or persons in specified categories ("need indicators"). Some allocations are adjusted to reflect interstate differences in per capita income or education expenditure per pupil; some are constrained by "hold harmless" rules or lower bounds on state shares of federal aid. The principal features of fund allocation formulas (both those now in use and those that might be considered as alternatives) and the main issues pertaining to each feature are summarized in this section.

Indicators of Need

Three types of need (person count) indicators figure in the current formulas. *Broad population counts*, such as numbers of children ages 5-17, influence allocations under the Chapter 2 Block Grant, Mathematics and Science, Drug-Free Schools, and Vocational Education programs. The number of children from families with income below the poverty line is the main factor used to allocate more than $5 billion in Chapter 1 grants (as of FY 1991) for the disadvantaged; other *counts of persons with attributes related to program goals* control allocations of Migrant Education, Adult Education, and Impact Aid funds. *Counts of persons actually served* govern allocations under the major programs of aid for education of the handicapped.

Some general concerns about the need indicators are whether they are sufficiently specific and related to program goals and whether they reflect the severity as well as the prevalence of educational problems. Examples of the questions that have arisen in connection with particular programs are these: (1) Would it be better to update poverty counts, even if

crudely, rather than to continue relying on Census data that are up to 10 years old? (2) Should greater weight be placed on the concentration of poverty, as opposed to the incidence of poverty? (3) Should poverty-related factors be incorporated into additional grant formulas? (4) Should counts of the handicapped be weighted to reflect differences in the cost of serving children with different kinds of handicaps? (5) Could factors more directly related to the severity of drug problems be substituted for the factors in the Drug-Free Schools program?

Fiscal Capacity Factors

Among the major ED grant programs, only the Vocational Education formula now takes into account differences in fiscal capacity (measured by per capita income) in distributing aid. The presence of such an adjustment in one formula but not in others raises the general issue of whether capacity factors belong in education grant formulas, or, more fundamentally, whether reducing interstate inequality in ability to support educational services should be a federal goal.

If fiscal capacity is to be taken into account, how should it be measured? Alternatives to the present per capita income measure include gross state product (GSP) per capita and the Representative Tax System (RTS) fiscal capacity index. Switching from a per capita to a per-pupil index of capacity is another important option. The method of incorporating fiscal capacity into an aid formula also deserves attention because different methods compensate to different degrees for interstate variations in ability to pay.

Fiscal Effort Factors

The present formulas contain no fiscal effort factors, but the Congressional mandate for this study has raised the issue of whether states should be rewarded in the future for fiscal effort to support education. (Fiscal effort is the ratio of a state's education revenue, less

federal aid, to its fiscal capacity.) The issue hinges partly on which fiscal equity goals, if any, the federal government should pursue in education and partly on the desirability of creating incentives to stimulate state and local education spending. In principle, either effort to support education in general or effort to support particular types of education could be rewarded, but only the former is now feasible because data on state and local spending by program or type of pupil are unavailable. There are alternative effort indicators to consider (corresponding to different measures of fiscal capacity) and alternative methods of incorporating them into the grant formulas.

Indicators of Education Costs

The current formulas contain no explicit cost factors, but it is generally understood that the per-pupil expenditure factors in the Chapter 1 and Impact Aid formulas are intended to serve as proxies for the cost of education. The questions arise, therefore, of whether the present per-pupil expenditure factors are adequate proxies for cost and whether better cost indices exist or can be developed. In addition, there is the broader issue of whether it is appropriate to adjust for interstate differences in the purchasing power of the education dollar and, if so, whether cost adjustments should be added to formulas that do not now have them.

Constraints on Allocations

Aid allocations under six major grant programs (Chapter 2 Block Grants, Mathematics and Science, Drug-Free Schools, Vocational Education, Adult Education, and Chapter 1 Concentration Grants) were restricted in FY 1989 by *lower-bound* provisions--for example, the rule that each state must receive at least 1/2 of 1 percent of the available funds. The usual justification for such aid floors is that a certain "critical mass" of funding is required to conduct the aided activity, but this rationale seems inapplicable to the programs in question

because each program parcels out aid in small amounts to local recipients. The rationale for the extra small-state allotments under these rules deserves to be reexamined.

Hold-harmless provisions are usually explained as devices for cushioning the shock of reductions in formula-based allotments, but a sharp distinction should be made between rules that limit the rate of decline (e.g., the Chapter 1 rule guaranteeing each county 85 percent of its prior-year funding) and rules that fix allocations indefinitely at levels that the states' relative needs may no longer justify (e.g., the rule that no state shall receive less Vocational Education aid than it received in FY 1985).

ACTUAL DISTRIBUTIONS OF FEDERAL EDUCATION AID AMONG THE STATES

Among the main considerations in assessing the existing fund distributions are (1) the magnitudes and patterns of interstate and interregional variations in aid, (2) the relationships between aid allocations and pertinent state characteristics, and (3) the relationships between the aid distributions and specific features of the funding formulas.

Interstate Variations in Aid

In FY 1989 total federal aid per K-12 enrollee under all 11 major grant programs varied among states from $130 in Utah to $335 in Montana, or by a ratio of 2.6 to 1 (excluding Alaska and the District of Columbia, which receive larger amounts for special reasons). The bar chart in Figure S-1, which arrays the states in descending order of federal aid per pupil, illustrates the pattern of variation and shows the relative positions of individual states.

Interstate variations are much greater under some programs than others. Table S-1 brings out the differences in degree of variability by showing for each major program the

Figure S-1
States Ranked by Federal Aid per Pupil

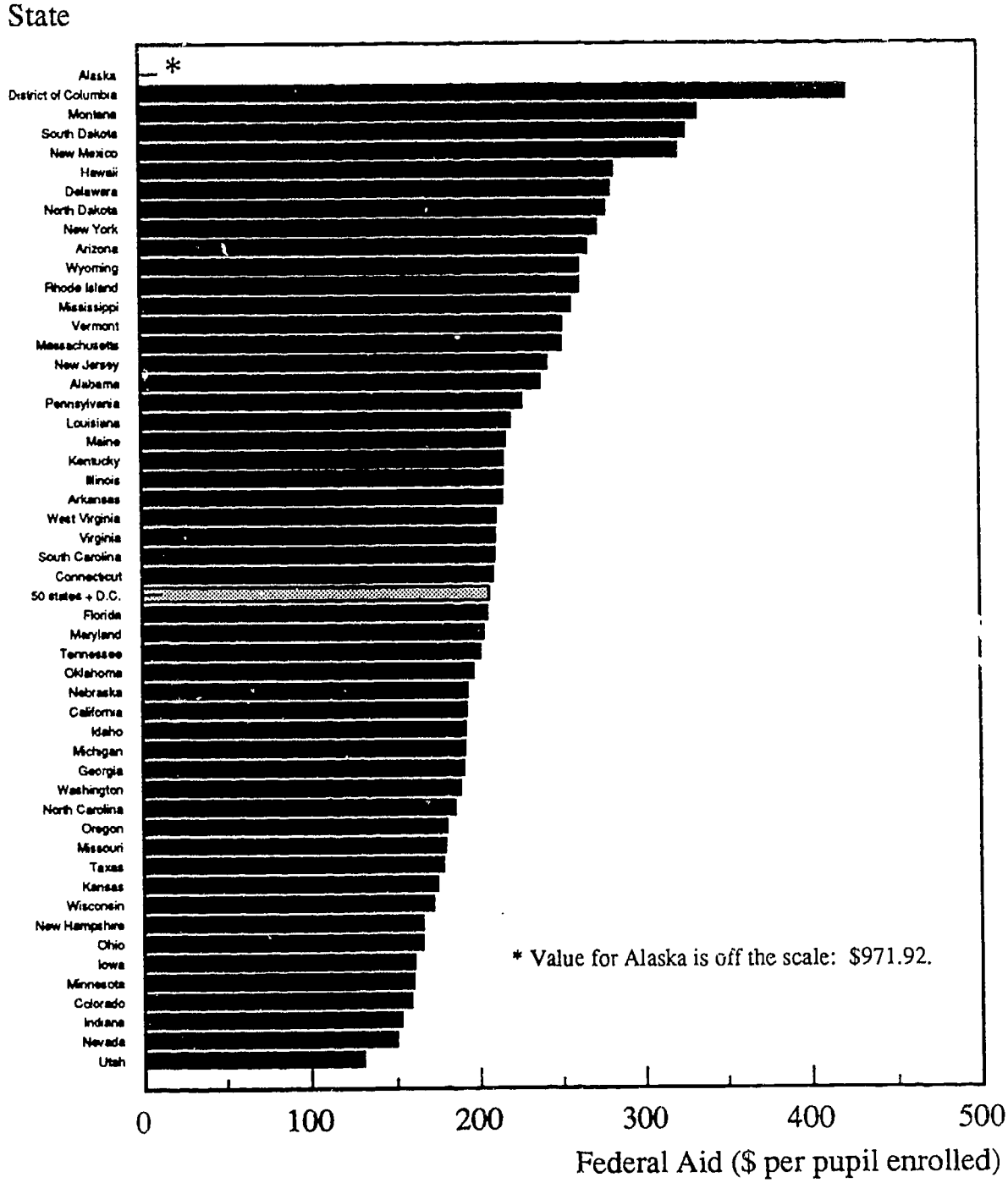


Table S-1

Federal Aid per Pupil as a Percentage of U.S. Average Federal Aid per Pupil
by Program and by State, Fiscal Year 1989

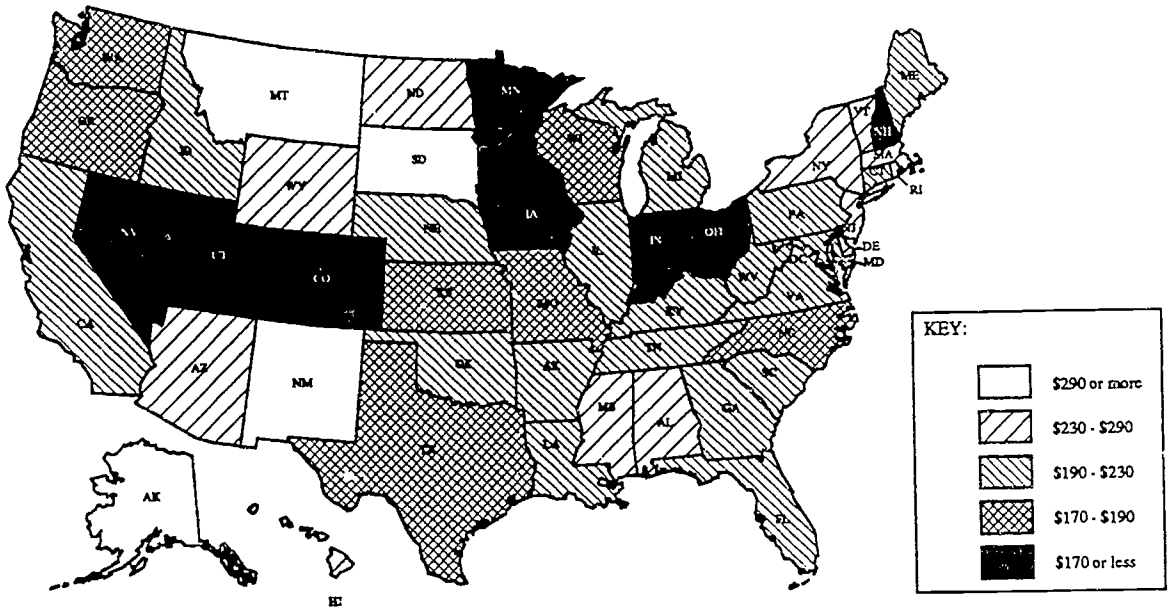
State	Chapter 1 Grants to LEAs	Migrant Education	Chapter 2 Block Grants	Mathematics and Science	Drug-Free Schools	Impact Aid	EHA Basic Grants	EHA Preschool Grants	Chapter 1 Grants for the Handicapped	Vocational Education Basic Grants	Adult Education	Total: 11 Programs
Alabama	121.7	39.0	97.3	100.0	96.9	55.0	132.5	230.4	10.7	112.0	115.0	113.6
Alaska	66.2	1,020.6	190.8	191.2	190.0	4,434.4	107.6	92.2	475.7	191.8	106.6	463.2
Arizona	79.2	182.6	94.3	83.5	93.9	633.9	87.4	72.3	33.7	97.7	77.6	127.5
Arkansas	112.5	144.4	93.4	101.7	93.0	33.1	94.9	138.4	92.7	105.4	122.6	102.6
California	87.9	292.4	92.9	93.3	92.5	90.2	86.8	89.1	9.6	77.6	71.5	92.1
Colorado	66.5	64.7	92.7	80.5	92.3	83.6	80.8	58.9	131.2	89.6	72.0	75.8
Connecticut	94.8	76.2	100.5	97.7	100.1	90.0	121.7	87.5	176.4	88.0	114.8	99.8
Delaware	123.3	108.7	210.2	210.6	209.2	2.5	100.5	16.8	643.0	211.3	170.0	134.0
District of Columbia	220.7	12.5	239.6	240.1	238.5	327.9	32.8	71.1	879.9	240.9	214.1	201.4
Florida	100.0	208.8	94.3	98.9	93.9	47.9	108.8	40.2	64.4	100.1	98.2	98.1
Georgia	105.6	37.0	97.5	93.5	97.1	42.5	76.9	99.9	34.4	103.0	102.8	91.3
Hawaii	73.2	0.0	121.3	121.5	120.8	819.9	66.0	57.4	38.0	122.0	116.5	134.9
Idaho	57.1	234.3	94.7	94.9	94.2	142.7	84.1	456.1	10.9	95.2	90.7	91.8
Illinois	107.7	16.5	103.9	104.3	103.5	38.6	107.2	127.9	344.4	95.9	105.2	102.7
Indiana	69.9	14.6	96.4	83.4	96.0	11.2	97.9	31.8	128.0	104.0	97.9	72.9
Iowa	72.1	2.9	96.2	84.7	95.7	2.4	110.0	98.3	40.4	100.3	99.7	76.8
Kansas	62.5	136.7	92.1	80.6	91.7	150.4	90.2	108.1	90.2	89.1	90.7	83.7
Kentucky	115.4	45.7	99.3	102.2	98.9	10.8	107.4	151.2	64.7	116.1	131.2	102.9
Louisiana	124.6	70.3	101.4	110.2	101.0	67.4	77.6	91.6	62.6	111.9	108.3	105.0
Maine	91.2	243.2	95.4	95.6	95.0	93.6	119.1	133.8	79.3	101.9	114.8	103.6
Maryland	99.8	9.0	98.6	95.6	98.2	71.4	119.0	113.1	50.4	93.8	107.1	97.0
Massachusetts	115.9	87.7	98.7	109.6	98.2	83.2	152.1	114.8	357.2	104.3	104.9	120.0
Michigan	100.0	89.6	97.3	97.8	96.9	26.2	88.6	71.1	139.7	98.0	93.1	91.5
Minnesota	67.9	40.6	93.0	79.5	92.6	44.5	104.5	104.5	9.5	91.6	83.7	76.4
Mississippi	158.1	59.8	98.9	118.3	98.4	49.4	108.7	74.3	20.8	107.3	113.5	122.5
Missouri	83.7	15.0	100.0	87.1	99.5	48.1	113.9	36.8	40.3	103.7	113.7	85.9
Montana	81.5	35.2	133.5	133.8	132.9	967.3	92.7	88.0	77.7	134.2	115.2	159.4
Nebraska	73.7	22.5	96.2	82.5	95.7	210.1	108.3	84.8	15.4	97.6	103.0	92.4
Nevada	43.4	51.5	115.1	115.4	114.6	123.9	82.1	46.4	45.2	115.8	100.7	71.5
New Hampshire	57.7	10.2	119.9	120.2	119.4	101.2	92.0	60.0	89.0	120.6	118.1	79.3
New Jersey	125.2	25.4	104.6	110.0	104.2	70.6	146.2	122.7	100.9	90.2	114.4	115.5
New Mexico	110.8	66.2	91.5	93.4	91.1	814.6	100.4	46.4	11.9	100.2	91.0	153.6
New York	171.2	34.8	103.8	130.8	103.3	27.2	94.4	173.4	241.7	98.9	113.4	130.1
North Carolina	89.3	35.6	94.2	88.3	93.8	53.0	96.2	106.6	30.1	113.5	117.0	88.7
North Dakota	76.6	79.0	171.0	171.3	170.2	498.3	94.7	123.3	76.4	171.9	145.2	132.5
Ohio	79.1	11.6	99.5	87.5	99.1	16.2	100.5	35.3	73.0	102.7	99.1	79.1
Oklahoma	69.5	26.5	93.9	80.6	93.4	270.3	102.1	78.5	19.4	102.9	96.8	94.1
Oregon	71.9	252.6	92.2	89.9	91.7	43.5	92.4	37.3	287.7	96.5	88.0	86.2
Pennsylvania	120.0	22.2	106.9	112.7	106.4	11.8	107.5	162.7	237.4	115.1	122.7	108.3
Rhode Island	117.5	15.0	152.1	152.4	151.4	131.0	134.8	61.4	123.2	152.9	184.6	124.8
South Carolina	104.5	7.0	95.4	94.2	95.0	76.7	114.3	128.8	18.8	113.3	114.6	100.3
South Dakota	98.8	7.3	160.1	160.4	159.4	717.9	102.8	130.9	46.5	161.0	139.6	155.9
Tennessee	105.2	3.3	96.4	95.1	96.0	25.1	114.8	95.7	20.9	113.0	120.3	96.0
Texas	81.5	213.2	91.0	89.0	90.6	52.3	88.6	65.4	51.9	88.9	77.1	85.2
Utah	33.8	23.7	88.6	71.5	88.2	140.6	89.6	68.8	59.9	76.3	50.3	62.1
Vermont	94.1	117.5	217.4	217.8	216.4	0.4	102.0	46.4	483.8	218.6	155.5	120.0
Virginia	83.4	5.9	90.7	82.5	90.2	244.4	109.5	159.3	24.1	93.9	103.7	100.6
Washington	59.9	225.1	89.7	80.2	89.3	216.2	86.5	172.0	73.0	87.7	71.4	90.3
West Virginia	115.7	1.9	95.3	98.6	94.8	1.2	121.2	91.3	64.8	110.4	136.9	100.8
Wisconsin	78.9	15.7	101.1	87.1	100.6	48.7	92.5	107.8	68.9	104.6	97.4	82.4
Wyoming	53.5	42.5	207.8	208.2	206.8	459.0	93.0	50.3	219.4	208.9	130.6	124.9
50 States + D.C.	97.8	100.7	99.2	98.9	98.8	101.4	100.2	100.8	101.3	99.8	99.3	99.1
Puerto Rico	231.0	64.6	114.1	147.9	113.6	4.6	49.9	49.9	10.8	111.2	125.9	144.7
Other Territories	129.1	8.5	423.5	309.2	695.0	221.7	456.5	90.2	184.8	98.8	242.9	224.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

relative amount of aid per K-12 enrollee received by each state (that is, each entry in Table S-1 is the amount of aid per pupil received by a state, expressed as a percentage of average aid per pupil under the same program in the United States). Six programs (Chapter 2 Block Grants, Mathematics and Science, Drug-Free Schools, EHA Basic Grants, Vocational Education, and Adult Education) fall into a "moderate variation" category, in which funds are allocated according to broad population counts or other factors that do not vary greatly relative to enrollment. Impact Aid, Migrant Education, and Chapter 1 Grants for the Handicapped are "high variation" programs, which allocate aid according to needs that are very unevenly distributed across states. The largest program, Chapter 1 Grants to LEAs, is in an intermediate category because of the special interaction between the two main factors in its formula (described later). Even under the moderate-variation programs, however, aid per K-12 enrollee varies by a factor of nearly 3 to 1 among states.

Regional Patterns

In FY 1989 per-pupil allocations under the 11 major grant programs combined ranged from about 20 percent above the national average in the "Mideast" section of the country (Delaware, District of Columbia, Maryland, New Jersey, New York, Pennsylvania) to 12 to 13 percent below average in the Great Lakes, Plains, and Rocky Mountain states. The following map diagram (Figure S-2) shows the pattern of geographic variation. No major area of the country contains exclusively high-aid or low-aid states. In particular, some of the states that receive the most federal aid per pupil (New Mexico, Montana, and South Dakota) and some that receive the least (Colorado, Nevada, and Utah) are clustered in the Rocky Mountain and Plains regions. Note, however, that the data on allocations under all 11 programs combined mask larger variations in allocations under particular programs. Per-pupil allocations of

Figure S-2
Interstate Variation in Federal Aid per Pupil



Chapter 1 Grants to LEAs are far above average in the Mideast and well below average in the West, but the low Chapter 1 allocations in the West are offset in part by high allocations of Impact Aid and Migrant Education funds.

Relationships Between Aid Allocations and State Characteristics

The relationships between education aid allotments per K-12 enrollee and selected fiscal, economic, and demographic characteristics of states are as follows:

State-Local Education Revenue. Federal funds provided under the 11 major grant programs accounted for 4.7 percent of total (federal, state, and local) education revenue in FY 1989, but the federal share varied from only 3.1 percent in Connecticut to 10.7 and 14.4 percent, respectively, in Mississippi and Alaska. In general, states that have more education

revenue per pupil of their own also receive more dollars per pupil (but smaller percentages of their total revenue) in federal aid. This pattern mainly reflects the positive relationship between aid and per-pupil expenditure under the Chapter 1 grant formulas. Federal grants tend to increase absolute dollar disparities but to reduce relative, or percentage, disparities in per-pupil spending among states, but the effects are minor because of the relatively small scale of federal aid.

Fiscal Capacity. Federal aid in general is positively (but only weakly) related to state fiscal capacity, mainly because of the influence of the Chapter 1 per-pupil expenditure factor. In the case of Vocational Education, the relationship is negative because of the inverse per capita income factor in the allocation formula. The strength of the aid-capacity relationship depends on the indicator chosen to represent fiscal capacity; in particular, the relationship is stronger when capacity is expressed in per-pupil than in per capita terms.

Fiscal Effort. There are no significant relationships, either positive or negative, between federal aid allocations and indicators of state fiscal effort to support education. In particular, although Chapter 1 allocations are based partly on levels of per pupil expenditure, they are not correlated with fiscal effort. The lack of such a correlation shows that linking aid to effort and linking aid to per pupil spending are not equivalent policies.

Demographic Characteristics. Aid allocations are related to several demographic characteristics of states. States with small enrollments, low ratios of enrollment to population, and declining enrollments tend to receive more aid per K-12 enrollee than states with the opposite attributes. Allotments of Chapter 1 Grants to LEAs increase with the incidence of poverty, but relationships between other aid allocations and poverty are not significant. States with relatively large percentages of minority-group members in their populations tend to

receive larger allocations of Chapter 1, Migrant Education, and Impact Aid funds but smaller Vocational Education grants.

Relationships Between Distributional Outcomes and Formula Designs

A prerequisite to improving fund allocation methods is understanding how aid distributions are related to the existing formula designs. The main relationships under the larger grant programs are as follows:

Chapter 1 Grants to LEAs. Because of a complex interaction between the two Chapter 1 formula factors--poverty rates and per-pupil expenditures--such high-income northeastern states as New York and New Jersey are interspersed in the highest-aid category with such low-income southern states as Mississippi, Louisiana, and Alabama. States can earn large amounts of aid per pupil either by having large numbers of low-income children or by ranking at the top of the per-pupil spending scale; they can receive low allocations because of different combinations of low poverty rates and low per-pupil spending. The whole distribution would be very different--most higher-income states would receive less aid and most lower-income states (and California) would receive more--were it not for the inclusion of the so-called cost proxy (per-pupil expenditure) in the formula.

Chapter 2 Block Grants. Three factors explain the interstate variations in Chapter 2 aid per K-12 enrollee. First, because such aid is allocated according to school-age population, aid per pupil falls as the ratio of enrollment to school-age population rises. Second, because of lags in data availability, aid per pupil is negatively related to the rate of enrollment growth. Third, the rule that each state must receive at least 1/2 of 1 percent of total aid sharply increases per-pupil allocations to the less populous states.

Aid for Education of the Handicapped. Differences in the ratio of handicapped pupils served to K-12 enrollment account for much of the interstate variation in total aid per pupil under the three major programs of aid for the handicapped, but other aspects of state policy also contribute to the disparities. Whether a state chooses to serve handicapped children in LEAs or in state-operated programs makes a difference, because a child served by the state (and hence eligible for Chapter 1 Grants for the Handicapped) earns more federal aid than a child served by an LEA. Also, because states were not yet obliged to serve all their handicapped preschoolers during the period considered here, large interstate differences in the percentages of such children served were reflected in the distribution of federal funds.

Vocational Education. The distribution of Vocational Education funds is shaped by factors similar to those that affect allocations of Chapter 2 Block Grants plus the effects of the adjustment for state per capita income. The per capita income factor substantially alters the interstate distribution by producing differentials as large as 50 percent between the per-pupil allocations of low-income and high-income states. There is also an interaction effect between the 1/2 of 1 percent floor and the income factor, in that the floor protects the small high-income states from the effects of the income adjustment. The formula's hold-harmless provision plays only a minor role.

ALTERNATIVES TO THE EXISTING FUND ALLOCATION METHODS

The foregoing findings about the present fund allocation methods and interstate distributions of aid raise numerous questions about the adequacy of current approaches and suggest many alternatives to, or changes in, the present formulas. In addition, other suggestions for changing the present formulas derive from past policy debates, from practices outside the federal education aid system, from the economic literature on intergovernmental

finance, and from the Congressional mandate for the present study. This report considers an array of these options. It examines the rationales and premises underlying each suggested change, explains key technical points, and shows how the interstate distributions of federal education aid would be altered if the alternative formulas were adopted. Although we have tried to represent diverse views about how the formulas might be improved, we cannot deal with all possibilities. That particular options are discussed does not imply that they are being recommended, or even that they would be suitable for practical use; that other options have been omitted in no way implies that they are irrelevant or undesirable.

The discussion of alternatives is organized topically rather than by program. It deals, in sequence, with alternatives involving poverty factors, other need indicators, adjustments for fiscal capacity, rewards for fiscal effort, adjustments for cost differentials, and changes in formula constraints.

Alternatives Involving Poverty Indicators

Poverty indicators play such a dominant role in the present (and proposed) mechanisms for allocating federal education aid that great importance attaches to the questions of how poverty should be measured and reflected in fund allocation formulas. Consideration of certain aspects of poverty measurement must be deferred until data from the 1990 Census become available, but the effects of several changes in the poverty indicators have been considered in this study.

The decisive influence of the poverty factor in shaping the distribution of Chapter 1 funds is brought out by comparing the current poverty-based distribution with an untargeted distribution based on each state's school-age population. The current formula provides substantially larger allocations to many southern states and other low-income states--but also

to New York and California--while reducing the allocations of 33 states (19 of them by at least 20 percent).

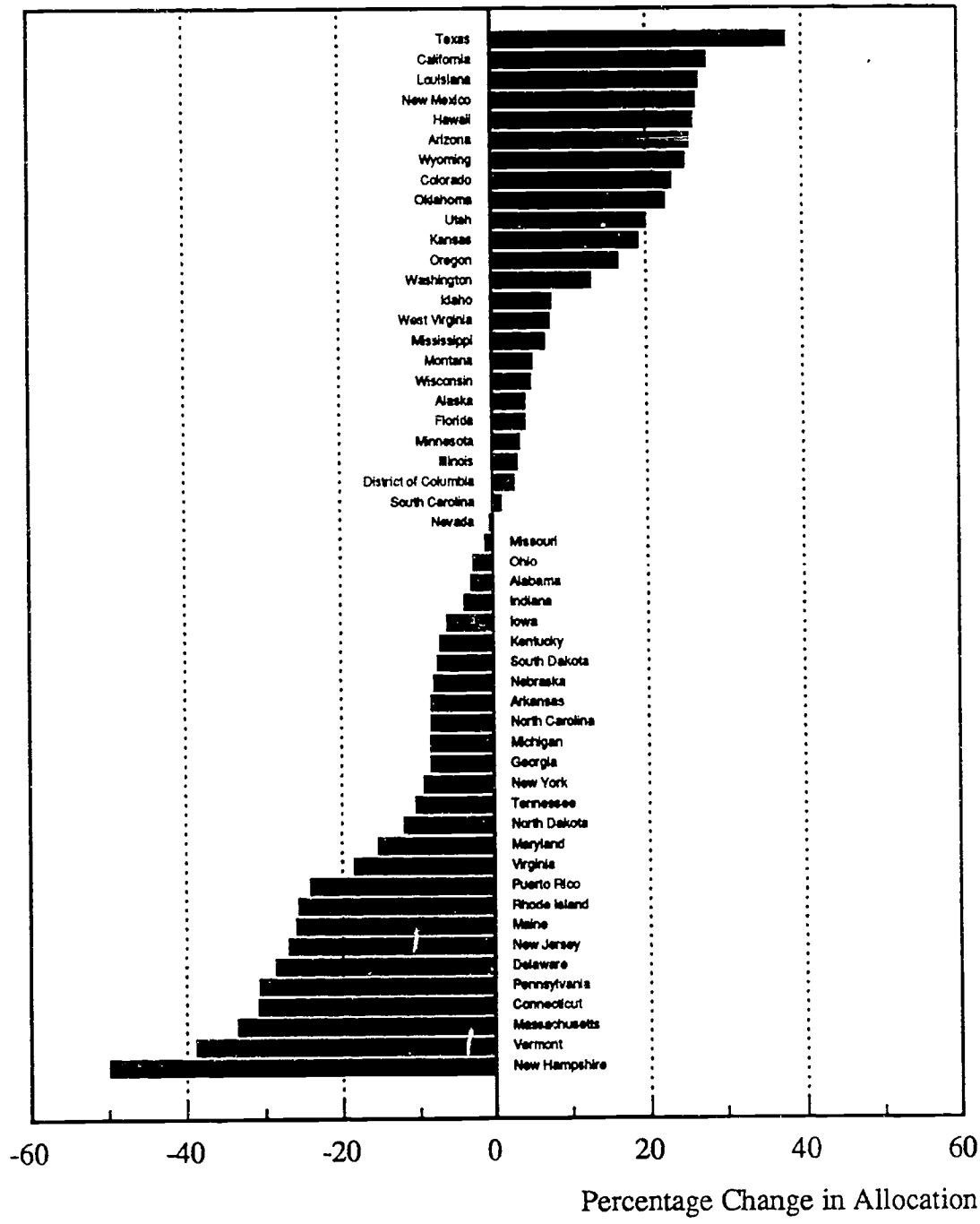
Two possible interim responses have been considered to the problem that the Census poverty counts used to distribute Chapter 1 funds are badly out of date. One approach, allocating funds according to Census-year percentages of poor children rather than absolute numbers of such children, would help to offset the effects of gross shifts over the decade in the distribution of the school-age population among states. Another option, using mid-decade estimates of child poverty, is attractive in principle but not satisfactory in practice because of doubts about data quality; however, it raises the issue of whether steps should be taken to produce official estimates for years between the decennial Censuses.

A frequently mentioned alternative to allocating Chapter 1 funds according to Census poverty counts is to allocate them instead according to numbers of children eligible for free school lunches. As shown in Figure S-3, this change would shift significant amounts of aid from the East to the Sunbelt and the West. The option is attractive because eligibility for the free lunches is based on a poverty criterion and the school lunch data are available annually, but various concerns would have to be addressed before such an approach could be seriously considered. The basic question is whether eligibility for free school lunches is an adequate proxy for poverty. Other questions concern the degrees to which the school lunch eligibility figures are influenced by state and local policies and potentially subject to manipulation. Some of these concerns should be resolvable once the 1990 Census data become available.

Some of the more complex poverty-related issues concern the role of poverty concentration (as distinguished from poverty incidence) in distributing Chapter 1 grants. The distribution of Concentration Grants is highly sensitive both to the eligibility criteria (absolute

Figure S-3

Changes in Allocations as a Result of Distributing Chapter 1 Funds According to Free-Lunch Counts Instead of Poverty Counts



versus relative concentration) and to the specific numerical settings of the eligibility thresholds. For example, raising the percentage threshold from 15 percent to 30 percent would cause significantly larger shares of Concentration Grant funds to flow to the major urban states. Concentration Grants are now only moderately more concentrated than Basic Grants, raising the question of whether greater concentration is appropriate. Because the degree of concentration is moderate, the fraction of total Chapter 1 funds distributed as Concentration Grants would have to be raised sharply to affect the interstate distribution of aid substantially. The unresolved basic issue is how strongly federal aid should be focused on places with the most severe poverty problems.

The effects of incorporating poverty factors into the formulas of programs other than Chapter 1 have been examined through simulations based on the Mathematics and Science grant formula. The current formula, which distributes funds partly according to each state's Chapter 1 allocation, gives considerably more aid to a mix of low-income states and northeastern urban states than would a formula based only on school-age population. Substituting a count of poor children for the Chapter 1 allocation would alter the results considerably by shifting aid in favor of states with low per-pupil expenditures. The option of allocating funds partly according to a poverty factor might also be considered in connection with several other ED programs, including the Chapter 2 Block Grant program and, especially, the Vocational Education program.

Alternatives Involving Need Indicators Other than Poverty

Most interested parties would agree that the need indicators in funding formulas should be specific, related to program goals, and sensitive to the varying severity of educational problems, but data limitations have made it difficult to apply these principles in practice.

Unfortunately, the same data limitations preclude empirical analysis of some promising options for improving the targeting of federal aid.

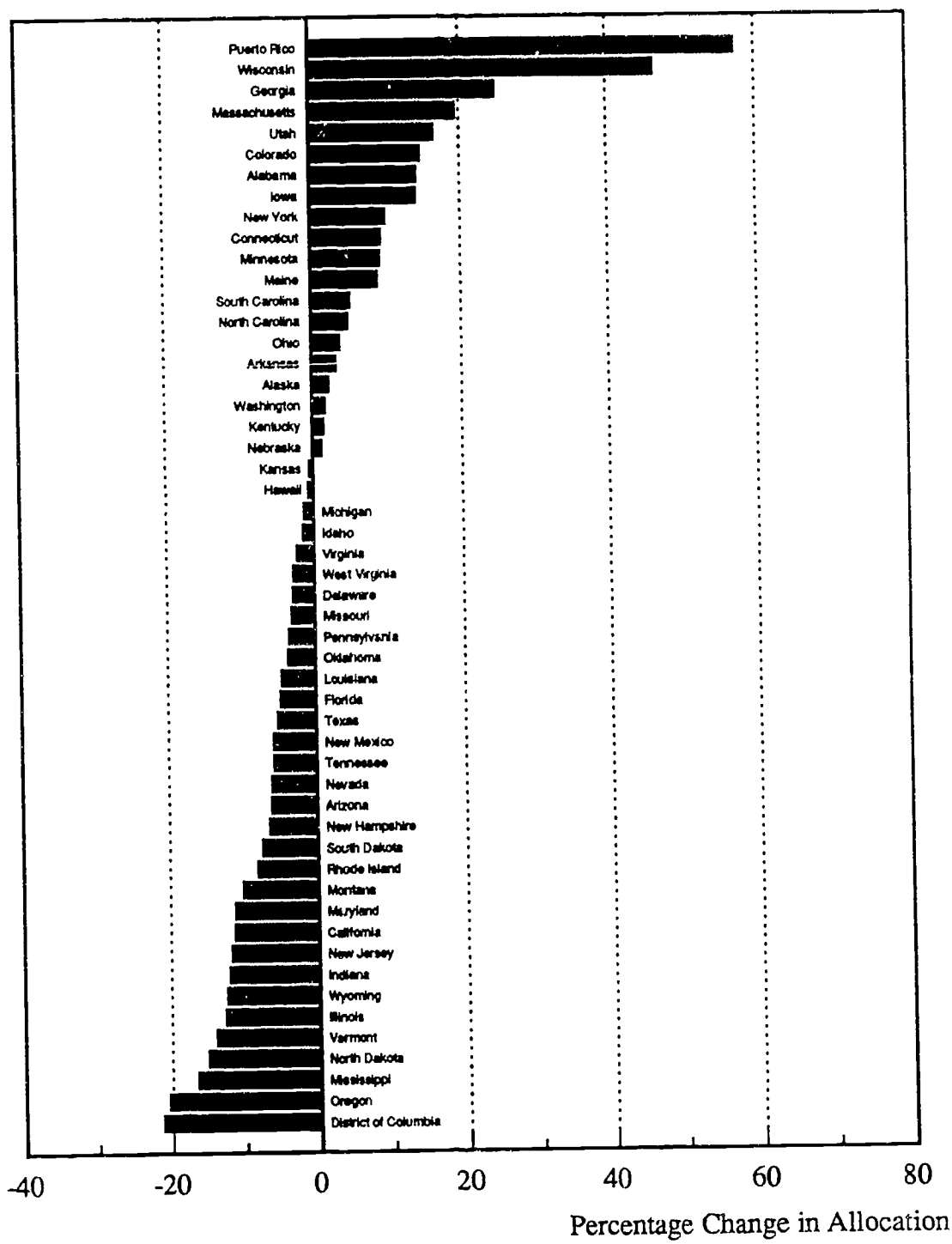
One proposal for taking into account the severity of needs that can be examined empirically is to distribute federal aid for education of the handicapped according to formulas that assign different weights to pupils with different handicapping conditions. Because the reported mix of pupils by handicapping condition varies significantly across states, a weighted-pupil formula (one that reflects differences in the cost of dealing with different types of handicaps) would produce an interstate distribution of aid significantly different from the current distribution. Figure S-4 shows that Wisconsin, Georgia, Massachusetts, and Utah (along with Puerto Rico) would gain substantially from such a formula, while such states as Oregon, Mississippi, and North Dakota would lose. Note that there is little apparent geographic pattern to the results.

But although the weighted-pupil approach is attractive conceptually (and well established in systems of state aid to local school districts) there are obstacles to applying it at the federal level. Methods of classifying children by handicapping condition appear to be inconsistent across states, making the weighted pupil counts suspect. Moreover, classification practices are manipulable and might be distorted in the pursuit of federal aid. Therefore, switching to the weighted-pupil approach would be premature until steps were taken to deal with these problems.

Other alternatives examined, all aimed at making need indicators more specific or more congruent with program goals, include (1) distributing funds under the Drug-Free Schools program partly according to indicators of poverty, metropolitan population, city population, or numbers of reported drug arrests; (2) allocating Migrant Education grants

Figure S-4

Changes in Allocations of EHA Basic Grant Funds as a Result of Taking into Account the Differential Costs of Serving Pupils with Different Handicapping Conditions



according to numbers of pupils served rather than pupils eligible and according to counts of current migrants rather than current and former migrants combined; and (3) revising the need factor in the Adult Education formula to avoid counting persons still enrolled in high school.

Adjustments for Fiscal Capacity

Only the Vocational Education program, among all the major ED formula grant programs, now distributes funds in an inverse relationship to state fiscal capacity (as measured by per capita income). This inconsistency with respect to an important aspect of fund allocation policy raises the broad issue of whether and where efforts to compensate for differences in state revenue-raising ability are appropriate. There are also many narrower, more technical issues concerning the specific manner in which fiscal capacity should be taken into account, and hence many alternative formula designs to consider.

The per capita income factor in the Vocational Education formula tilts the aid distribution in favor of the lower-income states. By design, the effects are limited to increasing the allocations of the poorest states by up to 18 percent and reducing those of the richest by up to 21 percent. The tilt could be increased slightly by deleting the present limits on the income factor or by changing its functional form. It could be increased far more drastically, however--in fact, to any desired degree--by changing the value of a formula parameter that controls the steepness of the aid-versus-income relationship.

A widely recognized weakness of the present Vocational Education formula is that per capita income is not a good measure of state fiscal capacity. Several alternative capacity indicators could be used in its place, including gross state product (GSP) and the Representative Tax System (RTS) index of fiscal capacity. Cutting across these rival indicators is the option of expressing fiscal capacity in per-pupil rather than per capita terms--

an alternative that makes intuitive sense in education. The capacity ratings of certain states vary considerably depending on how fiscal capacity is measured.

Shifting from the present per capita income indicator to either the GSP or RTS indicator would alter the distribution of Vocational Education aid significantly. The main losers would be such energy-producing states as Alaska, Louisiana, Oklahoma, Texas, and Wyoming and a few other states with special opportunities to impose taxes on nonresidents (Delaware, Hawaii, and Nevada). The principal gainers would be large urban states in the Northeast.

The effects of shifting from a per capita to a per-pupil measure of capacity are illustrated in Figure S-5. This change in the formula would redistribute funds along regional lines. Most western and some southern states would gain substantially, at the expense of the mid-Atlantic states, New England, and Florida.

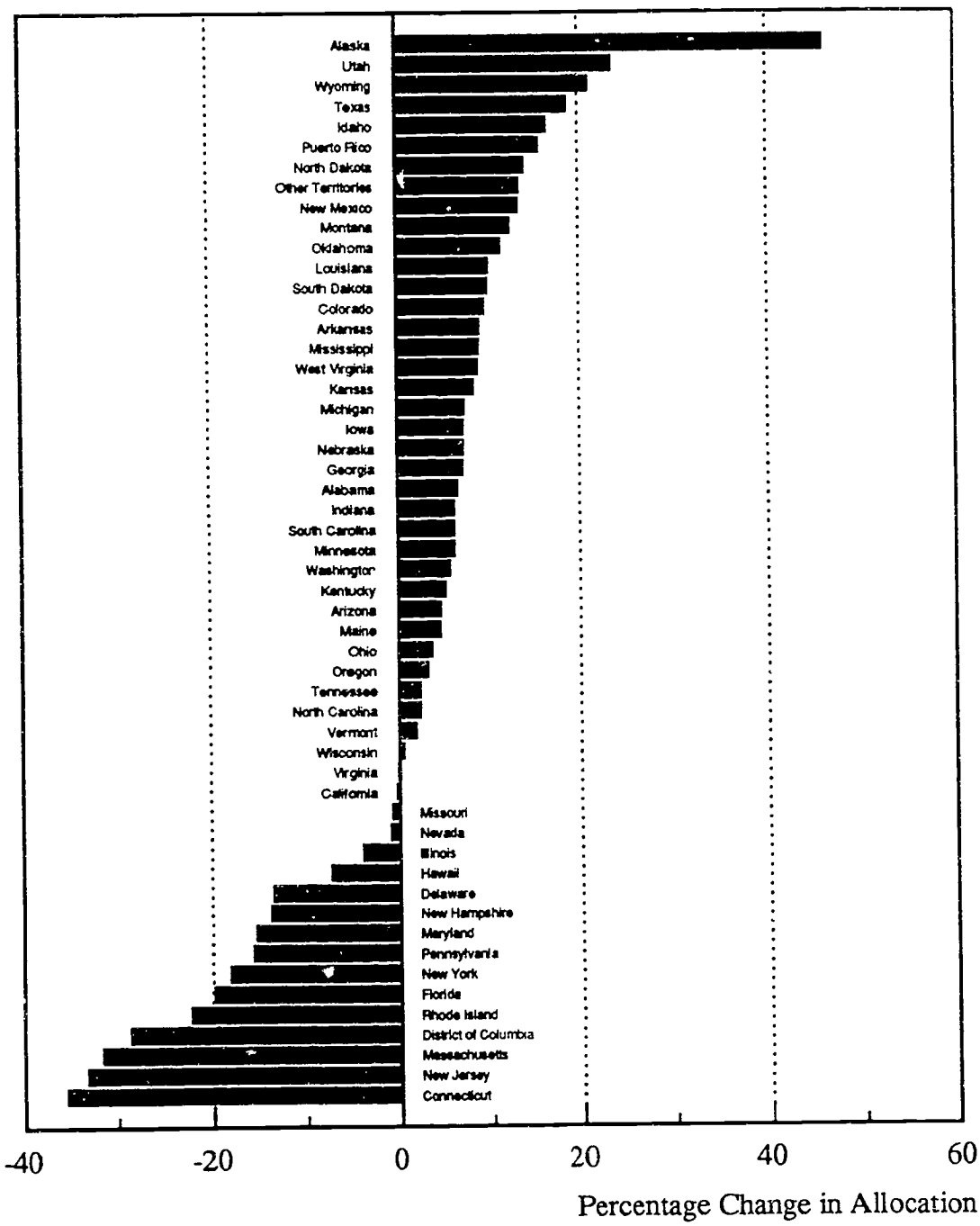
Simulations based on the Chapter 2 Block Grant formula have been used to illustrate the effects of incorporating adjustments for fiscal capacity into education aid programs other than Vocational Education. By definition, states with high fiscal capacities would lose from such adjustments and states with low fiscal capacities would gain, but the capacity ratings of certain states are so sensitive to the way capacity is measured that these states could come out behind or ahead depending on which capacity indicator was selected. In general, the redistributive effects of adjusting for fiscal capacity would be greater with a per-pupil th . . with a per capita fiscal capacity indicator.

Rewards for Fiscal Effort

The issue of whether states should be rewarded with increased federal aid for exerting above-average effort to support education was raised explicitly in the Congressional mandate

Figure S-5

Changes in Allocations as a Result of Switching to a per-Pupil Index of Fiscal Capacity in the Vocational Education Formula



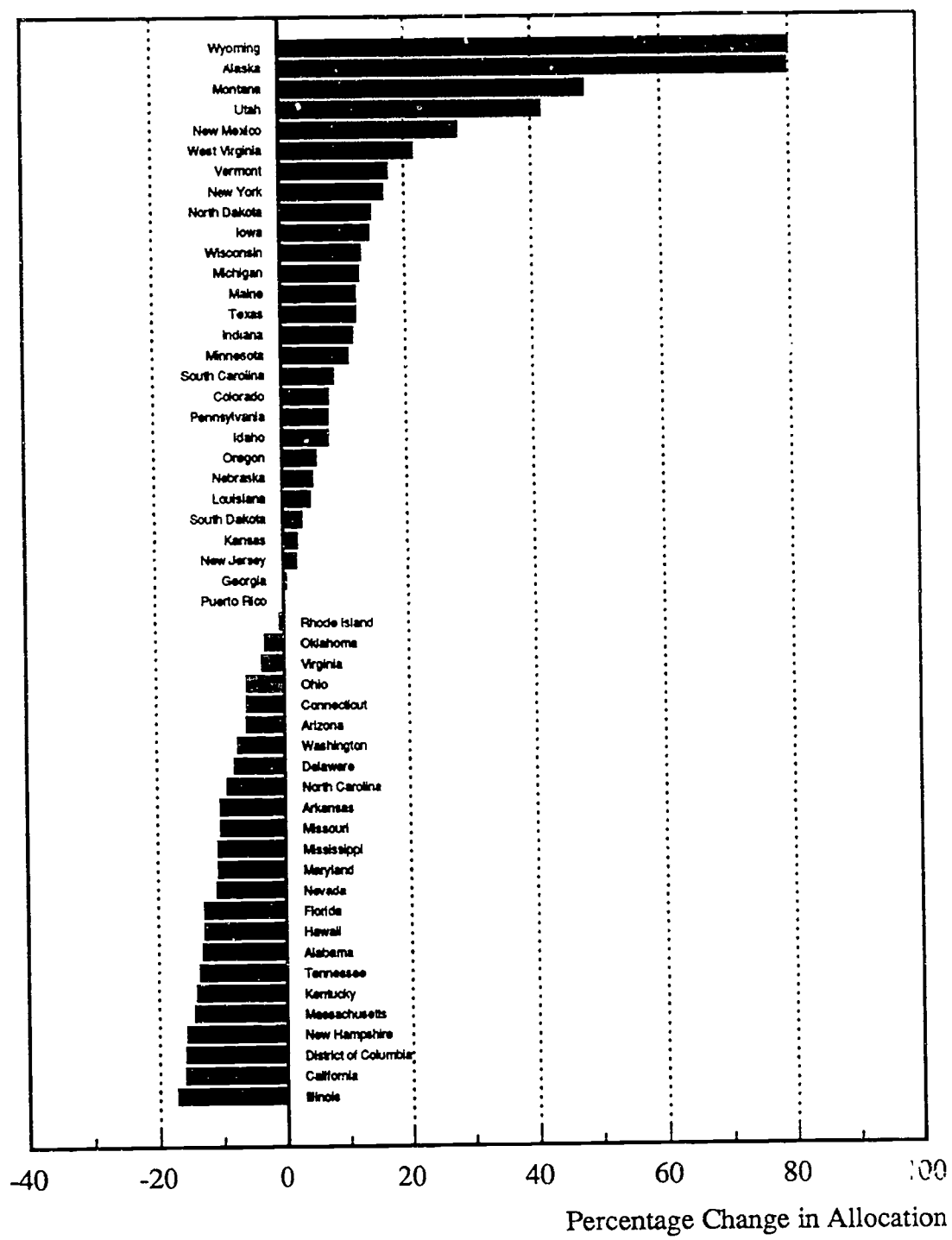
for this study. The usual motives cited for taking fiscal effort into account in allocating aid are to promote a particular type of equity goal (equality of fiscal opportunity) or to create an incentive for increased state-local funding of educational activities of interest to the federal government. In principle, federal aid could be linked to either effort to support education in general or effort to support specific types of education, such as vocational education and special education for the handicapped, but in practice, data limitations make it impossible to quantify program-specific effort. Consequently, only the option of rewarding effort to support education in general can now be examined empirically.

Multiple indicators of fiscal effort in education can be constructed, corresponding to the different fiscal capacity indicators mentioned earlier. Although the fiscal effort ratings of most states are fairly consistent across indicators, the ratings for some states vary widely depending on which definition of effort is selected. The fiscal effort indices are distorted, in certain instances, by conceptual flaws in the underlying measures of capacity.

Analyses of the effects of incorporating effort factors into the Chapter 2 Block Grant formula and the Chapter 1 Basic Grant formula show that certain unambiguously high effort states would gain and certain unambiguously low effort states would lose no matter how effort were measured, but that the effects on a few states are sensitive to the choice of an effort indicator. The gainers, regardless of which effort indicator is chosen, would include Michigan, Montana, New York, Oregon, Utah, West Virginia, Wisconsin, and Wyoming; the losers would include California, the District of Columbia, Hawaii, Illinois, Kentucky, New Hampshire, and Tennessee. For the most part, the redistributive effects are moderate; however, as can be seen from Figure S-6, a handful of western states would enjoy large increases in aid if fiscal effort were measured relative to personal income. The same figure

Figure S-6

Changes in Allocations as a Result of Incorporating an Income-Based Fiscal Effort Factor into the Chapter 1 Formula



also shows that the effects of rewarding fiscal effort would be geographically mixed; both high-effort and low-effort states can be found in each major region of the country.

An important objection to basing allocations on fiscal effort--that doing so may shift funds from poorer to richer states--can be addressed by using formulas that simultaneously reward effort and compensate for differences in fiscal capacity. These "variable matching" formulas can have radical redistributive effects, skewing aid allocations sharply in favor of low-capacity, high-effort states and reducing the allocations of high-capacity states even to zero, but such formulas can also be calibrated to produce any desired milder degree of fiscal equalization.

Differences in the Cost of Education

Although no explicit cost-of-education factors appear in the federal fund allocation formulas, it is understood that the bounded per-pupil expenditure factor in the Chapter 1 formulas is intended to serve as a proxy for cost (the factor is bounded in that it is not allowed to exceed 120 percent or fall below 80 percent of the national-average per-pupil expenditure). The presence of such a factor only in certain formulas raises an important issue of interprogram consistency: If an adjustment for interstate cost differentials is appropriate in Chapter 1, why is it not appropriate in other formulas as well? The choice of the bounded per-pupil expenditure factor to represent cost also raises the questions of whether this factor is a valid cost proxy and, if not, whether better cost indicators are available.

Compared with an otherwise identical formula that contains no per-pupil expenditure factor, the present Chapter 1 formula gives about 17 percent less aid to each of the lowest-spending states and 24 percent more aid to each of the highest-spending states. These shifts would be considerably larger if the per-pupil expenditure factor were not bounded. An

unbounded factor would skew the distribution sharply in favor of a few of the highest-spending and wealthiest states, reducing the allocations of nearly all the others.

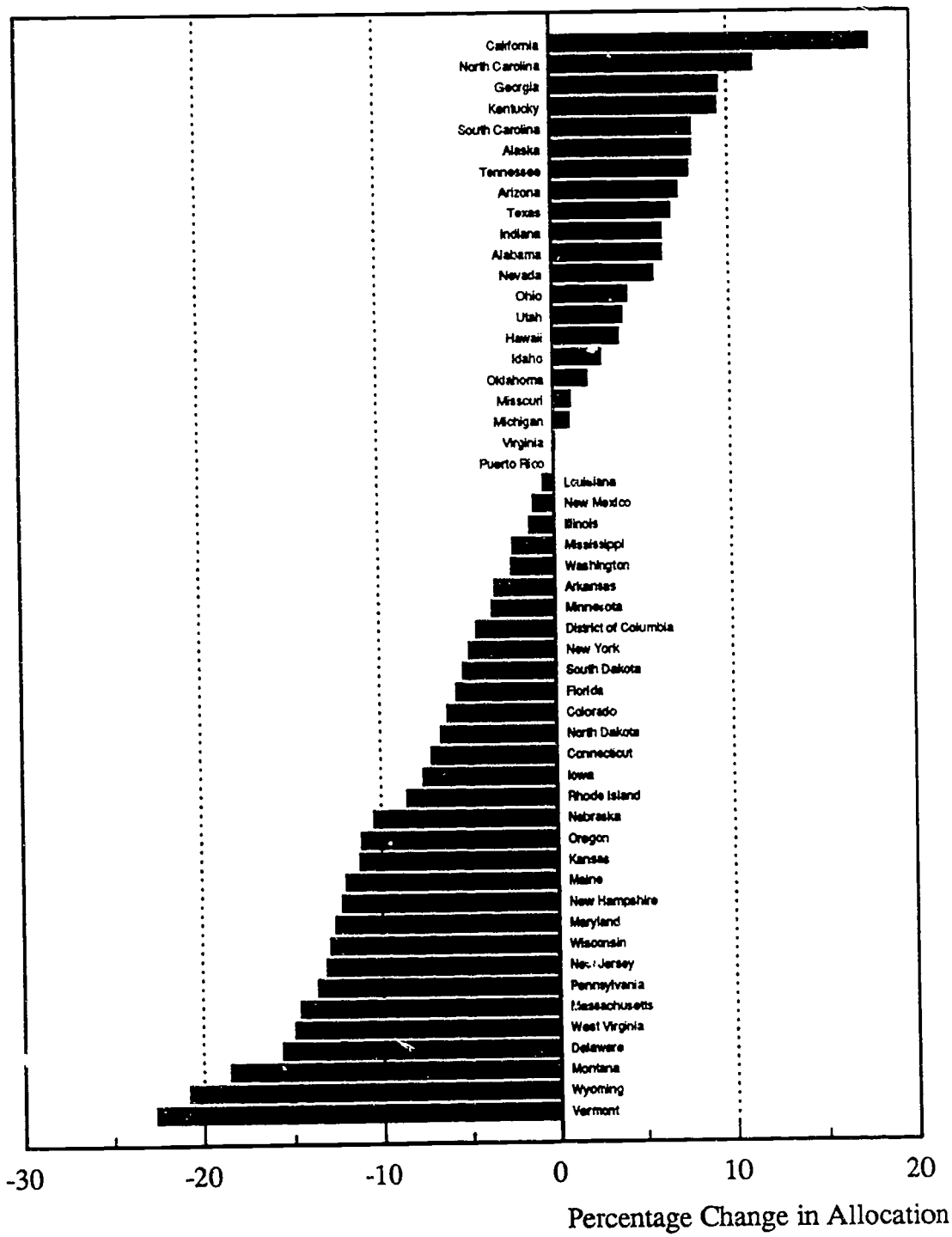
An issue that has recently caught policymakers' attention is whether defining per-pupil expenditure as expenditure per pupil in average daily attendance (ADA), rather than as expenditure per pupil enrolled, distorts the fund allocation process. The effects on the aid distribution of choosing one expenditure measure or the other turn out to be quite minor. The state most affected, California, seems to be penalizing itself by choosing a definition of ADA that depresses its reported per-pupil expenditure and hence its Chapter 1 allocation.

There is evidence that the per-pupil expenditure factor is not a good proxy for the cost of education. A comparison with two other cost-related factors, average teacher salary and the average private-sector wage, suggests that the expenditure factor systematically exaggerates the cost of education in higher-income states and underestimates it in lower-income states. The effect is to shift funds toward the former and away from the latter, detracting from equity in the distribution of Chapter 1 funds. Indices based on teachers' salaries and private-sector wages have important flaws of their own but probably approximate interstate differences in costs more closely than does the present Chapter 1 factor. It is not necessary to rely on these crude proxies, however, because improved indices could be constructed from available or feasible-to-collect data. Such indices, though still imperfect, would be preferable to the present per-pupil expenditure factor and hence candidates for use not only in the Chapter 1 formulas but also in other formulas that now contain no cost adjustments at all.

The effect of substituting an index based on teachers' salaries for the present cost proxy in Chapter 1 would be to shift funds toward states whose per-pupil expenditures are low relative to their levels of teacher pay. Figure S-7 shows that the gainers would be mainly

Figure S-7

Changes in Chapter 1 Allocations as a Result of Replacing the per-Pupil Expenditure Factor with an Index of Average Teacher Salary



southern states, but the biggest gainer by far would be California, which qualifies as a high-cost state by almost any definition but spends relatively little on its schools.

An analysis based on the EHA Basic Grants formula illustrates the effects of incorporating cost adjustments (specifically, indices based on teachers' salaries or private-sector wages) into a formula where none now exists. The gainers would generally be high-income but not necessarily high-spending states. It is noteworthy that some states that now benefit substantially from the per-pupil expenditure factor in Chapter 1 either would not benefit at all or would benefit much less from these alternative cost adjustments. Kansas, Montana, Vermont, and Wyoming, for example, all spend average or above-average amounts per pupil but would lose rather than gain from such adjustments because of their below-average teacher salaries and private wages.

Changes in Formula Constraints

The most important constraints attached to the current education aid formulas are provisions establishing floors under the amounts that even the smallest states can receive. The general effect of these floors is to increase the allocations to the 12 least-populous states sharply--by 39 percent, on average, but by more than 100 percent in certain cases--while reducing aid to all the other states by slightly less than 2 percent. As already mentioned, a convincing rationale for these lower bounds has not been provided, leaving unanswered the question of why such provisions should remain in the formulas.

The hold-harmless provisions now attached to the Chapter 1 and Vocational Education formulas have only minimal effects on aid distributions, but that situation could change if appropriations leveled off or if other aspects of the formulas were modified. In the latter event, hold-harmless provisions could be useful for phasing in redistributions gradually, but

only if they were of the proper type--namely, "fractional" hold-harmless rules that guarantee each state less than 100 percent of its prior-year funding.

Combinations of Alternatives

It would be necessary in any serious attempt to redesign formulas to consider many *combinations* of the changes discussed here, because such combinations are the means by which compromises can be forged between conflicting visions of distributional reform. As a practical matter, however, such combinations cannot be dealt with comprehensively but must be analyzed in more narrowly focused issue-specific and program-specific studies.

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1. INTRODUCTION

In the Hawkins-Stafford Elementary and Secondary School Improvement Amendments of 1988 (P.L. 100-297, Sec. 6207), Congress directed the U.S. Department of Education (ED) to

> conduct a study concerning the methods used for the allocation of funds among the States in the various programs of financial assistance to elementary and secondary education administered by the Department of Education.

This Congressionally mandated study is intended, according to the statute, not only to assess the federal fund distribution methods in general but also to address the specific issue of

> whether states and local school districts should be rewarded for making greater tax and fiscal efforts in support of general elementary and secondary education through adjustments of allocations under the various Federal financial assistance programs

and to

> consider other issues relating to the allocation of funds, such as the reliability and currency of poverty data used for purposes of program allocations under Chapter 1 of Title I of the Elementary and Secondary Education Act of 1956.

This document is the final report on the statutorily required fund distribution study. It examines the mechanisms now used to allocate funds under the major ED formula-grant programs in elementary and secondary education, the resulting distributions (as of fiscal year 1989) of federal financial aid among the states, and an array of possible changes in, or alternatives to, the existing methods of distributing funds.

BACKGROUND: AID PROGRAMS AND FUND ALLOCATION METHODS

The Department of Education's Elementary-Secondary Grant Programs

The federal government carries out its policies in elementary and secondary education primarily by giving intergovernmental grants to the state and local educational agencies (SEAs and LEAs) that actually operate and administer elementary and secondary schools. In fiscal year (FY) 1989, the U.S. Department of Education expended about $9.8 billion for elementary-secondary programs, nearly all for such grants, and in FY 1990 it expended approximately 11.0 billion.[1] Although these sums amount to less than 6 percent of total U.S. spending on public elementary and secondary education in the corresponding years, the importance of federal aid is greater than its share of funding suggests because such aid is heavily concentrated in certain strategic areas.[2] Most federal elementary-secondary grant programs either underwrite services for the disadvantaged, the handicapped, and other special-need children or support efforts to expand and improve education in areas deemed to be of particular national interest, such as mathematics and science, vocational education, and education about drugs. Federal financial aid plays a significant role, therefore, in efforts to accomplish two fundamental national education goals: promoting equality of educational opportunity and improving the quality of American schools.

Although the Department of Education administers dozens of elementary-secondary grant programs, each with its own statutory authority and appropriation, a small number account for the great bulk of all ED elementary-secondary aid. In FY 1989 the largest program, Grants to LEAs for services to disadvantaged children under Chapter 1 of Title I of the Elementary and Secondary Education Act of 1965 (referred to hereafter as "Chapter 1 Grants to LEAs"), distributed just over $4.0 billion--41 percent of the $9.8 billion total. The 5

largest programs, taken together, distributed $7.5 billion--76 percent of all such grants--and the 11 largest programs distributed $8.7 billion, or almost 89 percent of total ED elementary-secondary funds. By agreement with the Planning and Evaluation Service within the ED Office of Planning, Budget, and Evaluation, this study focuses on the last-mentioned 11 programs. All are "formula grant" programs--that is, programs that distribute funds to states or other units according to federally specified mathematical formulas, as opposed to programs that award grants on a discretionary basis.[3] Each distributed over $100 million in federal aid in FY 1989.[4] These programs are enumerated, with their FY 1989 and FY 1990 appropriations, in Table 1.

Fund Allocation Methods

In characterizing the current fund allocation methods, it is important to distinguish between the "typical" method and two important exceptions. Under the typical arrangement, found in 9 of the 11 eleven major ED programs, aid is first distributed among states according to an explicit interstate fund allocation formula and then among LEAs (and sometimes other authorized recipients) within each state either according to one or more intrastate fund allocation formulas or at state discretion. Under the Chapter 1 Grants to LEAs program, however, the initial distribution by formula is among counties rather than among states, and so the interstate distribution emerges as a by-product of the allocation of funds among counties. In the case of Impact Aid, a statutory federal formula allocates aid directly to local school districts, bypassing the states entirely. Therefore, although most major ED programs distribute funds among and within states in two separate stages, the less typical method of allocating funds directly among local units (counties or LEAs) governed the distribution of $4.7 billion

Table 1

Major Elementary-Secondary Grant Programs Administered by the U.S. Department of Education

Program	Appropriation (S million) FY 1989	Appropriation (S million) FY 1990	Percentage of Total ED FY 1989 Elementary-Secondary Budget
Chapter 1 Grants to LEAs (Basic + Concentration Grants)	4,026.1	4,768.3	40.9
Education of the Handicapped Act--Basic Grants to States	1,475.4	1,542.6	15.0
Vocational Education--Basic Grants	818.7	837.6	8.3
Impact Aid--Maintenance and Operations	708.4	717.4	7.2
Chapter 2 Block Grants	463.0	455.7	4.7
Subtotal: 5 largest programs	7,491.6	8,321.6	76.1
Drug-Free Schools--State Grants	287.7	460.6	2.9
Migrant Education (Chapter 1)	271.7	282.4	2.8
Education of the Handicapped Act--Preschool Grants	247.0	251.5	2.5
Handicapped--State-Operated Programs (Chapter 1)	148.2	146.4	1.5
Adult Education--Grants to States	136.3	157.8	1.4
Mathematics and Science--State Grants	128.4	126.8	1.3
Subtotal: 11 largest programs	8,710.9	9,747.1	88.5
Other ED elementary-secondary programs[a]	1,129.3	1,218.3	11.5
Total ED elementary-secondary budget[a]	9,840.2	10,965.4	100.0

Notes to Table 1

Source: "Congressional Action, Fiscal Year 1990," budget summary prepared by the Budget Service, Office of Planning, Budget, and Evaluation, U.S. Department of Education, June 18, 1990.

Note: Among the programs enumerated here and examined in this report are some that would not qualify under a strict definition of "elementary-secondary" programs. Two examples are that (1) a substantial fraction of Vocational Education aid is distributed to postsecondary institutions, but it is not feasible to separate the elementary-secondary and postsecondary portions, and (2) Preschool Grants under the Education of the Handicapped Act are for preprimary children (ages 3-5) rather than for elementary-secondary education children. Strictly speaking, it is more accurate to refer to the programs represented in this table as "programs pertaining mainly to education below the postsecondary level" than as "elementary-secondary" programs.

a. The "total ED elementary-secondary budget" and "other ED elementary-secondary programs" entries represent the total budgets of the following components of the Department: Office of Elementary and Secondary Education (OESE); Office of Bilingual Education and Minority Language Affairs (OBEMLA); Office of Special Education and Rehabilitative Services (OSERS) *less* amounts appropriated for Rehabilitative Services and Special Institutions, which are not considered elementary-secondary programs; and Office of Vocational and Adult Education (OVAE). The totals do not include any funds appropriated for the Office of Educational Research and Improvement (OERI) or for departmental management. They do, however, include small amounts that are not appropriated for grants to state and local recipients but that are reserved for evaluations, special studies, awards, fellowships, and other such nongrant activities.

in FY 1989 and $5.5 billion in FY 1990 (Chapter 1 Grants to LEAs plus Impact Aid), or about half of all elementary-secondary aid.

The formulas that determine the distributions of funds across states vary among programs in some important respects, but all share one basic feature: each allocates aid according to numbers of persons in some specified category or categories (e.g., population ages 5-17 or the number of low-income children) in each state or locality. Under 6 of the 11 major programs, these person counts are the *only* factors taken into account in calculating aid allotments. Under the other 5 programs, the formulas also include adjustment factors--namely, either state per capita income or per-pupil expenditure on elementary-secondary education. Mathematically, the formulas are very simple, usually involving nothing more than allocations proportional to the person counts just mentioned or, in some cases, to person counts multiplied by adjustment factors. Some formulas also constrain allocations by stipulating, for example, that each state must receive at least a certain minimum share of the total funds appropriated for a program or that no state may receive less than a certain percentage of what it received in some earlier period.

FORMULA DESIGN ISSUES

How elementary-secondary education aid should be distributed among states is a sensitive and much-debated issue of federal education policy. It resurfaces from time to time in Congress, in diverse concrete forms, especially when grant programs are being created or expanded or when the pertinent statutes come due for reauthorization. Often, the contested aspects of fund distribution are narrow and highly program-specific (an important recurrent issue, for example, is precisely how poor children should be counted for the purpose of distributing Chapter 1 Grants to LEAs), but occasionally broader and more fundamental issues

come to the fore. Whether differences in revenue-raising ability among states should be taken into account in allocating aid is an example of one of these broader issues, as is the question raised in the Congressional mandate for this study of whether formulas should reward states for exerting above-average fiscal effort to support elementary and secondary schools.

In keeping with the Congressional mandate, this study approaches fund distribution issues from a formula-design perspective, that is, it emphasizes the *logic* underlying the fund allocation formulas, the *technical adequacy* of formulas and their components, the *coherence and comprehensiveness* of the present funding mechanisms in dealing with the multiple factors pertinent to fund distributions among states, and the *rationales* for possible changes in or alternatives to the present allocation methods. The overarching substantive issues are whether the formulas are well designed to support substantive program goals and distribute funds equitably or whether the allocation methods need to be improved. Concretely, these issues translate into such specific, design-oriented questions as the following:

- Do the formulas take proper account of interstate variations in needs for the types of educational services that are supported with federal aid? Are better need indicators available, or could they be developed?
- Do the formulas adjust adequately, or should they adjust, for interstate differences in fiscal capacity and fiscal effort to support education? If such adjustments are called for, how should fiscal capacity and effort be measured and reflected in the formulas?
- Do the formulas deal appropriately with other pertinent differences in conditions among states (e.g., differences in state size or in the cost of education)?
- Do the fund allocation methods create incentives for states to use resources or configure their programs in certain ways, and if so, are these incentives consonant with the programs' objectives?

These questions underlie the analyses of current and alternative fund distribution methods later in the report.

ORGANIZATION OF THE REPORT

The three chapters that make up the remainder of this report deal, respectively, with the present fund allocation formulas, the actual distributions of federal aid among states (as of fiscal year 1989), and various alternatives to, or changes in, the current fund allocation methods.

Chapter 2 describes, analyzes, and compares the existing fund allocation formulas and discusses formula design issues and policy options. The analysis deals in detail with individual formula components, including need indicators and other formula factors; the mathematical forms of the aid allocation equations; and the constraints that limit state allotments under certain programs. The discussion of issues reviews a variety of concerns raised by the current allocation methods, assesses the conceptual underpinnings of existing and alternative formula designs, and notes some of the practical limitations (mainly limits on data availability and data quality) on what can be done to improve the distributions.

Chapter 3 describes and analyzes the existing distributions of federal elementary-secondary education grant funds among the states. It provides tabular and graphic summaries of fund distribution patterns under each program, analyzes interstate and interregional disparities in per-pupil allocations, and examines relationships between aid allocations and selected state characteristics. It then explains how each formula produces the observed distributional patterns and how particular formula features affect the results.

Chapter 4 presents and assesses numerous alternatives to the existing fund allocation formulas. The alternatives considered range from relatively narrow and technical ones (e.g.,

changes in the way a formula factor is measured or in the value of a particular formula parameter) to broad ones involving the incorporation of new factors into formulas or drastic changes in formula design. Although many of these alternatives pertain only to particular programs, some are applicable to federal education aid programs in general--for instance, the options of rewarding states for fiscal effort and adjusting allocations for interstate differences in fiscal capacity and cost. The chapter examines the rationales and premises underlying each alternative, explains key conceptual and technical points, and shows how the interstate distribution of aid would be altered if each alternative were adopted.

Notes

1. See Table 1 and the appended table notes for explanations of what these figures do and do not include.

2. The $9.8 billion in ED elementary-secondary aid amounts to 5.8 percent of the $169 billion that the National Education Association (NEA) estimates was expended for elementary and secondary education (current expenditures only) in the United States in 1988-89 (NEA, 1989). Note, however, that additional federal aid for elementary and secondary education comes from programs administered by other federal departments, such as the Headstart program (administered by the Department of Health and Human Services) and the school lunch programs (administered by the Department of Agriculture).

3. A program is classified as a "formula grant" for this purpose if the allocation process that determines the interstate distribution of funds is governed by a formula, regardless of whether any subsequent allocation of funds within each state is also controlled by formulas. Thus, the formula-grant category includes certain programs under which federal funds are distributed among states by formula but within states wholly or partly at the discretion of state officials. See Chapter 2 for details.

4. Two other ED elementary-secondary programs, Magnet School Assistance and Bilingual Education, also had appropriations over $100 million in FY 1989, but they are not covered by this study because their funds are allocated at the discretion of federal administrators rather than by formula.

2. THE EXISTING FUND ALLOCATION FORMULAS

Each major elementary-secondary education grant program examined in this report distributes federal aid according to a Congressionally prescribed procedure built around one or more statutory fund allocation formulas. This chapter examines the formulas that govern the distributions of federal education dollars among states. The chapter explains in detail how each formula works, analyzes the individual formula factors and components, and identifies issues raised by the formula designs.

GENERAL CHARACTERISTICS OF THE GRANT PROGRAMS

It may be helpful to begin with a review of certain general characteristics of federal elementary-secondary grant programs to place the fund distribution formulas in context. Table 2 shows for each major program (1) the program title and statutory authority; (2) the stated purpose of the program, including the intended beneficiaries or "target groups" if any; (3) an outline of the program's fund allocation process, identifying the different stages of the process and the allocation methods used at each stage; and (4) the level of program funding in fiscal year (FY) 1989.

The table points up several distinctions among programs that are relevant in assessing the federal fund allocation methods:

First, the scale of federal funding varies greatly across programs. The largest program, Chapter 1 Grants to LEAs (Basic Grants and Concentration Grants combined), was funded in FY 1989 at just over $4 billion per year, whereas each of the smaller grant programs had total annual funding in the $100 million to $150 million range; that is, the largest distributed about $80 million per state, on average, while the smallest distributed only about $2 million per state. Clearly, the consequences of formula designs and possible changes in the formulas are

Table 2

General Characteristics of the Major U.S. Department of Education Elementary-Secondary Formula-Grant Programs

Program (Short Title)[a]	Statutory Authority	Stated Purpose and Target Groups[b]	Outline of the Fund Allocation Process	FY 1989 Funding ($ millions)
Chapter 1 Grants to LEAs (Basic Grants and Concentration Grants)	Chapter 1 of Title I, Part A, Elementary and Secondary Education Act of 1965 (ESEA), as amended.	To support compensatory education programs for educationally deprived children in schools with concentrations of low-income children.	1. Allocation to counties or LEAs by federal statutory formula.[c] 2. Allocation to LEAs within counties (where necessary) according to state formulas of federally specified type.[d]	$4,026.1 (Basic Grants; 3,853.2 Concentration Grants, 172.9)
Migrant Education	Chapter 1 of Title I of ESEA, Part D, Subpart 1, as amended.	To support and improve programs of education for present and former migratory children.	1. Allocation to states by federal statutory formula. 2. Substate allocation at state discretion.	271.7
Chapter 2 Block Grants	Chapter 2 of Title I of ESEA, Part A, as amended.	Multipurpose assistance to states and LEAs, with some funds earmarked for "effective schools" programs (no specific target groups).	1. Allocation to states by federal statutory formula. 2. Allocation of at least 80 percent to LEAs by state formulas of federally specified type; remainder at state discretion.[e]	463.0
Mathematics and Science	Title II of ESEA, as amended.	To improve the skills of teachers and the quality of instruction in mathematics and science (no specific target group).	1. Allocation to states by federal statutory formula. 2. Substate allocation of 90 percent of elementary-secondary funds by federal statutory formula; remainder at state discretion.	128.4
Drug-Free Schools	Title V of ESEA, as amended.	To establish programs of drug abuse education and prevention (no specific target group).	1. Allocation to states by federal statutory formula. 2. Substate allocation of up to 70 percent by federal statutory formula; remainder at state discretion.	287.7
Impact Aid	P.L. 81-874 (Impact Aid, Maintenance and Operations), as amended.	To assist LEAs financially burdened by the presence of federal activities (no restrictions on uses of funds).	Allocation direct to LEAs by federal statutory formula.	708.4

(continued)

Table 2, continued

General Characteristics of the Major U.S. Department of Education Elementary-Secondary Formula-Grant Programs

Program (Short Title)[a]	Statutory Authority	Stated Purpose and Target Groups[b]	Outline of the Fund Allocation Process	FY 1989 Funding ($ millions)
EHA--Basic Grants	Education of the Handicapped Act, Part B--Assistance for Education of All Handicapped Children.	To help states and LEAs to finance special education services for all handicapped children, ages 3-21.	1. Allocation to states by federal statutory formula. 2. Allocation of 75 percent to LEAs by federal statutory formula; remainder at state discretion.	1,475.4
EHA--Preschool Grants	Education of the Handicapped Act, Sec. 619.	To provide additional funds to assist states and LEAs in providing special education services to handicapped children ages 3-5.	1. Allocation to states by federal statutory formula. 2. Allocation of 75 percent to LEAs by federal statutory formula; remainder at state discretion.	247.0
Chapter 1 Grants for the Handicapped	Chapter 1 of Title I of ESEA, Part D, Subpart 2, as amended.	To help states to finance special education services for handicapped children from birth to age 21 in state-operated or state-supported programs.	Allocation to states by federal statutory formula. No substate allocation; funds used to finance state-operated and state-supported programs.	148.2
Vocational Education	Carl D. Perkins Vocational Education Act of 1984 (P.L. 98-524), Title I, Vocational Education Assistance to the States.	To help states provide vocational education for special-need students (disadvantaged, handicapped, single parents and homemakers, etc.) and to improve vocational education programs.	1. Allocation to states by federal statutory formula. 2. Allocation of set-asides for the handicapped and disadvantaged by federal formula, but with some state leeway to influence the results; allocations of other funds at state discretion.[f]	818.7
Adult Education	Adult Education Act (P.L. 89-750), Grants to States, as amended.	To help states provide adult basic education and other adult education services.	1. Allocation to states by federal statutory formula. 2. Substate distribution at state discretion.	136.3

Notes to Table 2

a. These short titles are the terms used to identify programs throughout the remainder of this report.

b. These stated purposes and target groups reflect the intended uses of federal aid, as specified in the various statutes. It should not be inferred, however, that all funds distributed under the education aid programs necessarily translate into support for the designated activities or target pupils. There are reasons to believe that federal funds under certain programs are "fungible"--that is, substitutable for state or local funds that might otherwise have supported the federally designated activities; consequently, some federal aid may not translate into net additions to spending for the educational activities or types of pupils in question. Issues of fungibility, targeting, and net fiscal effect are beyond the scope of this study.

c. The statute stipulates that the federal formula shall be used to distribute funds to LEAs when the necessary data are available, but such data are normally available only when LEAs are coterminous with counties.

d. The statute says only that the state shall allocate funds among the LEAs within each county on an "equitable basis" according to criteria prescribed by ED, but under the regulations, state discretion is limited mainly to selecting an appropriate indicator of the number of low-income children in each LEA.

e. States are required to distribute Chapter 2 Block Grants among LEAs mainly according to school enrollment (public plus private) in each LEA's territory but with adjustments to reflect the varying numbers of "costly to educate" children in each LEA. A state's discretionary role in designing its formula extends to selecting factors to represent the number of "high cost" children and determining how these factors will be incorporated into the formula.

f. Although the formulas for distributing the handicapped and disadvantaged set-aside funds within states (as of FY 1989) specify the factors to be taken into account, namely, numbers of handicapped and disadvantaged students enrolled by and served in vocational education by each grantee, states are left with substantial discretion to determine how these categories shall be defined and measured. Moreover, states have also been permitted to divide the available funds into separate "pools" of sizes that they (the states) determine for different classes of recipients. (Note: in the 1990 amendments to the Perkins Vocational Education Act, Congress prescribed a new set of substate fund allocation formulas to replace the allocation methods described here.)

more significant for the large programs than for smaller ones. This is reflected in the amount of attention given to each formula in this report and in the degree of refinement, or "fine tuning," considered in the analysis of formula alternatives.

Second, some important variations in fund allocation processes need to be considered. Under most of the grant programs represented in Table 2, federal aid is distributed according to a standard two-stage process: (1) federal funds are allocated among states according to an interstate fund allocation formula; (2) funds are allocated within states either according to one or more substate allocation formulas or through discretionary processes. But in two important cases, as mentioned in the introduction, the process diverges from this standard model. The initial formula-based distribution of Chapter 1 Grants to LEAs is to counties rather than to states, and a second-stage allocation is made, where necessary, to LEAs within each county. Impact Aid funds are distributed directly to LEAs. Aggregate statewide allocations under both programs must be determined, therefore, by summing the county-level or LEA-level allocations. The pertinent formula alternatives for the two programs are considerably different from alternatives for programs that have explicit formulas for allocating federal funds among states.

Third, program goals and definitions of the intended beneficiaries vary among the programs from highly specific to extremely broad. At one end of the scale, certain programs, including the largest ones, are intended either to help pupils in particular special-need categories (the disadvantaged, the handicapped, migrants) or to establish programs or improve programs in specific areas of education (mathematics and science, vocational education, drug education). At the opposite end of the scale, recipients of Chapter 2 Block Grants may use them to support a wide variety of services, some benefiting the student population as a whole

rather than any particular target group, and recipients of Impact Aid funds may use such funds for any purpose whatsoever. Clearly, different fund distribution methods may be appropriate when the educational needs being addressed are highly specific than when the needs are general--a point of particular relevance in assessing the "need indicators" in the various formulas.

Fourth, the federal role in financing the particular educational activities for which federal aid is provided, relative to the state and local roles, also varies considerably among programs. In some cases, federal aid is supposedly provided to pay up to the full costs of specified educational services that are distinct from and supplemental to the services provided under state or locally funded "regular" programs. This conception applies, especially, to the compensatory education services for the disadvantaged supported by Chapter 1 Grants to LEAs. In other cases, however, federal funds simply add to the state and local funds available to provide certain services or to help certain categories of pupils, and the federal role is reasonably described as one of sharing the cost of, or subsidizing, particular educational activities. The latter model applies, for example, to most federal aid for the handicapped, because such aid covers only a minor fraction (less than 10 percent) of the cost of special education services and because states and LEAs are legally obligated to provide such services regardless of the availability of federal funds. The answers to such basic formula design issues as whether aid allocations should reflect state or local "fiscal effort" or "ability to pay" may depend on whether the aid in question is intended to support separate, supplemental federal programs or to contribute incrementally to the financing of activities that states or LEAs would support anyway.

FUND ALLOCATION FORMULAS

The remainder of this chapter examines the formulas that determine the *interstate* distributions of funds under the major ED elementary-secondary grant programs. The key features of each formula are summarized in Table 3. (All descriptions pertain to the formulas used to allocate federal funds appropriated in FY 1989.) Each formula is characterized in terms of the allocation factors it contains (distinguishing between the basic need, or "person count," factors and others); its mathematical form; and any associated constraints affecting state shares of the appropriated funds.

Allocation Factors

It has become standard in the economic and policy literature on intergovernmental grants to classify the factors in fund distribution formulas as indicators of *needs, fiscal capacity, fiscal effort, and cost.* These categories have been adopted in the education finance field as well, where they are frequently used to analyze state formulas for allocating aid to local school districts. They are equally useful for discussing existing and alternative formulas for distributing federal elementary-secondary education aid. The rationales for including each type of factor in grant formulas and for quantifying the factors in different ways are discussed later under the heading "formula design issues." For the moment, this four-way taxonomy--need, capacity, effort, and cost--is used merely to describe the formulas and to compare them with one another.

Need Indicators. As already noted, each formula considered in this report allocates funds among states or other units according to at least one indicator of relative need for educational services. In nearly all cases, these need indicators are numbers of persons in

Table 3

Principal Features of Formulas that Determine the Interstate Distributions of Aid:
Major Elementary-Secondary Education Formula-Grant Programs, FY 1989

Program	Formula Factors: Need Factors (Person Counts)	Formula Factors: Other Factors	Mathematical Formula	Constraints
Chapter 1 Basic Grants to LEAs	Number of "eligibles," defined as number of children from families with incomes below the poverty line (plus certain other disadvantaged children) in each county or LEA.[a]	State education expenditure per pupil in average daily attendance (ADA), but not less than 80 percent nor more than 120 percent of average expenditure per pupil in ADA in the U.S.[b]	County or LEA allocation proportional to product of number of eligible children in the LEA or county and the bounded per pupil expenditure factor for the state.[c] State allocation is sum of county allocations.	No LEA or county receives aid unless it has at least 10 eligible children. No county receives less than 85 percent of its prior-year allocation.
Chapter 1 Concentration Grants to LEAs	Number of eligible children (see above); number in excess of 6,500; number in excess of 15 percent of population 5-17; number eligible in previous year.	Allocation under the Chapter 1 Basic Grant program.	County allocation proportional to the product of (a) the greater of (i) the number of eligible children in excess of 6,500 in the prior fiscal year or (ii) the number of eligible children in the prior fiscal year (if greater than 15 percent of the number of children 5-17 in the county) and (b) the county's Chapter 1 Basic Grant authorization divided by the prior-year number of eligible children.[d]	Each state receives at least (a) $340,000 or (b) the lesser of 0.25 percent of total concentration grant funds or 150 percent of the product of the U.S.-average per pupil payment and the number of pupils eligible for concentration grants in the prior year.[e]
Migrant Education (Chapter 1)	Reported number of eligible migrant children 5-17 (full-time equivalent) in each state.	Same bounded per pupil expenditure factor as in the Chapter 1 Basic Grant formula (see above).	State allocation proportional to product of number of migrant children and the bounded per pupil expenditure factor.[f]	–
Chapter 2 Block Grants	Population 5-17.	–	Allocation in proportion to population 5-17.[g]	No state receives less than 0.5 percent of total funds.
Mathematics and Science	Population 5-17; state's allocation under Chapter 1 of the Education Consolidation and Improvement Act of 1981 (ECIA).[g]	–	Allocation of 1/2 of funds in proportion to population 5-17; allocation of 1/2 in proportion to the state's allocation under ECIA Chapter 1.[f,g]	No state receives less than 0.5 percent of total funds. No state receives less than it received in FY 1988.
Drug-Free Schools	Population 5-17.[h]	–	Allocation in proportion to population 5-17.[f,h]	No state receives less than 0.5 percent of total funds.

(continued)

Principal Features of Formulas that Determine the Interstate Distributions of Aid:
Major Elementary-Secondary Education Formula-Grant Programs, FY 1989

Program	Formula Factors: Need Factors (Person Counts)	Formula Factors: Other Factors	Mathematical Formula	Constraints
Impact Aid	Number of children in average daily attendance in an LEA whose parents (a) reside *and* work or (b) reside *or* work on federal property or (c) are members of the armed forces; number of handicapped children in the same categories.	Expenditure per pupil in average daily attendance in the LEA. Expenditure per pupil in average daily attendance in the state and the U.S.	Summary only: Allocations to LEAs calculated by multiplying pupil counts by "local contribution rates" based on per pupil outlays of the LEA, "comparable" LEAs, the state, or the U.S. Special multipliers for handicapped and certain other children. Complex proration and priority rules apply when funds insufficient to cover all allocations.	(Multiple constraints and contingencies built into the mathematical formula.)
EHA--Basic Grants to States	Handicapped children ages 3-21 receiving special education services, but not more than 12 percent of all children ages 3-17 or 5-17.[i]	--	Allocation in proportion to count of handicapped children served in special education.[f]	--
EHA--Preschool Grants	Handicapped children ages 3-5 receiving special education services; estimated increase from the previous year in the number of such children who will be served.	--	State allocation in FY 1989 was $500 per handicapped child ages 3-5 served in special education plus a share of the remaining funds proportional to the estimated increase in the number of such children to be served.[f,j]	--
Handicapped--State-Operated Programs (Chapter 1)	Handicapped children ages 0-21 in state-operated or state-supported programs.	Same bounded per pupil expenditure factor as in the Chapter 1 Basic Grant formula (see above).	State allocation proportional to product of number of handicapped served by state agencies and the bounded per-pupil expenditure factor.[f]	--
Vocational Education	Population ages 15-19, Population ages 20-24, Population ages 25-65.	"Allotment ratio," defined as 1 minus .5 times the ratio of state per-capita income to U.S. per capita income (but not less than .4 or more than .6).[k]	Allocation proportional to the product of a weighted sum of the three population factors and the aforesaid state allotment ratio.[l,m]	No state receives less than it received in FY 1985. No state receives less than the lesser of (a) 0.5 percent of total funds or (b) 150 percent of what it received in the prior year.
Adult Education	Persons over 16 with no high school diploma or equivalent.[n]	--	$250,000 allocated to each state; remainder allocated in proportion to number of persons 16 and over without a high school diploma.[o]	($250,000 base allocation built into the formula.[p])

Notes to Table 3

a. The number of eligible children counted for purposes of distributing Chapter 1 Basic Grants is the sum of (a) the number of children from families with incomes below the poverty line in 1979, as determined by the 1980 Census, (b) the number of children from families above the poverty line but that receive payments in excess of the poverty level from the program of Aid to Families with Dependent Children (AFDC), (c) the number of children living in institutions for neglected and delinquent children, and (d) the number of children being supported in foster homes with public funds. The first factor, known as the number of "Census poor," accounts for more than 90 percent of all eligibles. Factors (b), (c), and (d) are updated annually, but the numbers of Census poor remain fixed at their 1979 values.

b. The per-pupil expenditure factor is actually defined in the statute as 40 percent of each state's expenditure per pupil in average daily attendance (ADA) but no less than 80 percent and no more than 120 percent of the U.S. average thereof. The 40 percent multiplier is of no consequence, however, as it cancels out when funds are prorated to conform to each year's appropriation ceiling. The per-pupil expenditure factor for Puerto Rico is defined under a special rule as the product of (a) the fraction that Puerto Rico's per-pupil expenditure is of the lowest per-pupil expenditure of any state and (b) 32 percent of the average per-pupil expenditure in the United States.

c. The formula is used to allocate aid directly to LEAs in cases where adequate LEA-level data exist (mainly where LEAs are coterminous with counties); otherwise it is used to allocate aid among counties, and allocations to LEAs within counties are handled in a subsequent stage of the distribution process. The formula applies as stated to the 50 states, the District of Columbia, and Puerto Rico. Separate amounts are set aside under the statute for other outlying areas and for the Secretary of the Interi to use in providing services for Indian children.

d. Concentration grants are allocated to the 50 states, the District of Columbia, and Puerto Rico; there are no funds for other outlying areas.

e. An additional provision attached to the Concentration Grant formula is that no state may receive, by virtue of the 1/4 of 1 percent rule, more than 150 percent of the Concentration Grant allocation it received in the prior year; however, this provision was inoperative in FY 1989 because no Concentration Grant funds were appropriated in FY 1988.

f. This formula applies to the 50 states, the District of Columbia, and Puerto Rico. Other outlying areas receive funds under separate provisions.

g. As of FY 1990, the second formula factor is defined as the state's allocation under Part A of Chapter 1 of Title I of the Elementary and Secondary Education Act (ESEA) of 1965, as amended.

Notes to Table 3, continued

h. As of FY 1990, one-half of the funds appropriated under the Drug-Free Schools program are to be allocated according to state allocations of aid under Part A of Chapter 1 of Title I of ESEA, as under the Mathematics and Science program.

i. In FY 1989, the 12 percent limit applied to children ages 3-17 if the state served all handicapped children ages 3-5 in special education programs under state law or practice or under court order; otherwise, it applied to children ages 5-17.

j. The formula also provides for adjusting state allocations upward or downward to correct for prior-year errors in estimating the numbers of children ages 3-5 to be served in special education.

k. The per capita income variable used in calculating each state's allotment ratio is the average of state per capita incomes in the three most recent years for which data are available. Allotment factors for Puerto Rico and the other outlying areas are not calculated according to the stated formula but are set at 0.6, the maximum value allowed for states.

l. According to the statute, 50, 20, and 15 percent of the available funds, respectively, are distributed according to populations in the 15-19, 20-24, and 25-65 age ranges, and the remaining 15 percent is allocated in proportion to the resulting total allotments. Thus, the true weights assigned to the three population factors are 58.8, 23.5, and 17.6 percent, respectively.

m. The Vocational Education formula, unlike the other formulas, applies not only to the 50 states, the District of Columbia, and Puerto Rico but also to the other outlying areas.

n. Note that the number of persons counted for distributing Adult Education grants includes persons ages 16 and older who are still enrolled in school, even though such persons are not among those served by adult education programs.

o. The formula applies to the 50 states, the District of Columbia, and Puerto Rico. Amounts of $100,000 each are made available for the other outlying areas, to be apportioned among them "according to their respective needs for assistance."

p. The $250,000 is a base allocation rather than an aid floor. The minimum amount allocated to any state is $250,000 plus the share of aid in excess of the base allocation earned by the state with the smallest number of persons age 16 and over without a high school diploma.

specified categories related in some way (sometimes closely, sometimes only very broadly) to the program's objectives. Such indicators can be thought of as representing, albeit crudely, the relative volumes of services that states would provide in particular areas of education if all states had identical policies for serving each type of pupil. Often, one of these person-count variables is the *only* factor on which the distribution of a particular pool of federal education aid depends.

The person-count variables are of three types: (1) *broad population counts*, such as the number of school-age children in each state; (2) *counts of persons with particular attributes* related to the purposes of the program in question, such as numbers of poor or migrant children; and (3) counts of *persons served* by a program--that is, numbers of pupils who actually participate in the kinds of educational activities that are supposedly being supported with federal funds. Specifically, the person-count factors reflected in Table 3 can be summarized in terms of the foregoing three types as follows:

Four major elementary-secondary grant programs distribute federal funds according to broad population counts. Three of these, Chapter 2 Block Grants, Mathematics and Science, and Drug-Free Schools, allocate aid to states according to school-age population (defined as population in the age range 5 to 17 and referred to henceforth as "population 5-17"). (The Mathematics and Science program also incorporates a second factor, discussed later.) The fourth program, Vocational Education, distributes aid according to a weighted sum of each state's populations in the 15-19, 20-24, and 25-65 age brackets.[1]

Four other programs, including the multibillion dollar Chapter 1 LEA Grant program, allocate funds according to numbers of persons with attributes related to the program's goals. In the case of Chapter 1 Grants to LEAs, the relevant attribute is poverty, and funds are given

out mainly according to the number of children ages 5-17 in each county from families with incomes below the poverty line; however, certain other categories of low-income or otherwise disadvantaged children also are included in the count of "eligibles" on which the allocations are based (see the notes to Table 3 for details).[2] Under the Adult Education program, the designated indicator is the number of persons age 16 and over in a state who do not have a high school diploma. Under the Migrant Education program, it is the number of eligible migrant children, as reported by states through a special data collection system known as the Migrant Student Record Transfer System (MSRTS).[3] Finally, under the Impact Aid program, which is intended to relieve districts of some of the financial burdens supposedly created by the presence of federal activities and facilities, funds are allocated to LEAs according to LEA-reported figures on numbers of children whose parents live or work (or both) on federal property.[4]

The three major programs of aid for the handicapped, EHA Basic Grants, EHA Preschool Grants, and Chapter 1 Grants for the Handicapped in state-operated or state-supported programs, all allocate funds according to numbers of children that states report as receiving special education. Specifically, Basic Grants under the Education of the Handicapped Act are allocated according to numbers of children served in the 3-21 age range; EHA Preschool Grants are allocated according to numbers served in the 3-5 age group; and Chapter 1 Grants for the Handicapped are allocated according to numbers of children from birth to age 21 served in state-operated or state-supported institutions.[5] In most other contexts, determining how many children are served would be problematic because the threshold level of service needed for a child to qualify as "served" is often ambiguous. In the case of the handicapped, however, the count is facilitated by the requirement in the Education

of the Handicapped Act that all handicapped children receive individualized education programs (IEPs). Operationally, counting children served in special education translates into counting the number with these IEPs.

Finally, one program, Mathematics and Science, distributed half its funds in FY 1989 not according to an explicit person-count factor but rather according to state allocations under the Chapter 1 LEA Grant program. (The same factor has also been incorporated into the Drug-Free Schools aid formula beginning with FY 1990.) The state allocation under Chapter 1 can reasonably be construed as an indirect person-count factor, however, in that such allocations are themselves determined mainly by the numbers of low-income children in each state. If this indirect connection is taken into account, it can be said that all funds under the major formula-grant programs are allocated primarily according to person-count variables.

Fiscal Capacity Factors. A fiscal capacity indicator is intended to represent the relative abilities of states or localities to raise revenue from their own sources. The usual rationale for including such an indicator in a federal aid formula is that federal aid should help to compensate for differences in grantees' abilities to support the programs or services in question with their own funds. Accordingly, the capacity indicator is incorporated into the formula in such a way that it establishes a negative relationship between a state's or a locality's aid allocation, or share of federal aid, and the chosen measure of ability to pay.

The only fiscal capacity indicator found among the elementary-secondary grant programs covered by this report is the per capita income variable in the Vocational Education Basic Grants formula. (The same income factor also appears in the formula for allocating aid under the Education Department's Vocational Rehabilitation program, which is not examined

here because it is not an elementary-secondary program.) Specifically, per capita income is used in the Vocational Education formula to compute an adjustment factor defined as,

$$1 - 0.5 \frac{\text{state per capita income}}{\text{U.S. average per capita income}},$$

and limited to a range from 0.4 to 0.6.[6] The effect of incorporating this adjustment factor into the Vocational Education formula (specifically, entering it as a multiplier of the formula's population factor) is to give the lowest-income states up to 150 percent as much aid (relative to population) as the highest-income states.[7]

The presence of an adjustment for fiscal capacity, or ability to pay, in one major grant formula but not in the others raises an obvious issue of consistency in program design as well as broader issues concerning the appropriateness of taking ability to pay into account in distributing federal education funds. These issues are discussed later in this and subsequent chapters.

Fiscal Effort Factors. A fiscal effort factor is supposed to represent the degree of effort that a state or locality exerts, or the "sacrifice" it makes, to support a particular function or activity. The purpose served by including such a factor in an intergovernmental grant formula is usually characterized as "rewarding" grantees for their financial contributions or creating financial incentives for grantees to spend more on the aided activity than they would otherwise have spent. Fiscal effort is defined as the ratio of the grantee's own financial contribution to its fiscal capacity. For example, if one measures a state's fiscal capacity by its per capita personal income, the ratio of that state's education revenue from state and local (i.e., nonfederal) sources to state personal income is the state's fiscal effort to support education.

No current ED elementary-secondary grant formula contains an explicit fiscal effort factor. It has sometimes been suggested that the per-pupil expenditure factors in the Chapter 1 and Impact Aid formulas qualify as such, but they do not fit the standard definition set forth above (that is, they are not expressed as ratios to fiscal capacity and are not net of federal aid), and their generally recognized roles are to serve as proxies for the cost of education. Congress has directed, however, that the concept of rewarding states for fiscal effort be examined; consequently, effort factors, although now unrepresented in the formulas, receive considerable attention later in this report.

Cost Factors. The rationale for including cost factors in intergovernmental grant formulas is to adjust for interstate (or intrastate) variations in the costs of providing educational services. Such variations reflect geographical differentials in the prices of the resources used in education (including the salaries of teachers and other staff) and, by some definitions, differences in the quantities of resource inputs required to produce equivalent educational services. Ideally, a cost-adjustment factor would take the form of a cost-of-education index, measuring interstate or interdistrict differences in prices of educational resources (or unit costs of educational services), but no operational versions of such an index have been developed.[8]

Although no cost-of-education indices per se appear in the elementary-secondary grant formulas, it is generally understood that the bounded per-pupil expenditure factor that appears in all the Chapter 1 formulas (Basic and Concentration Grants to LEAs, Migrant Education, and Grants for the Handicapped in state-operated or state-supported programs) is intended to serve as a rough proxy for such an index.[9] That bounded expenditure factor is defined as the average expenditure per pupil in average daily attendance (ADA) in a state but not less than 80 percent or more than 120 percent of the U.S. average expenditure per pupil in ADA.[10]

The various per-pupil expenditure factors in the Impact Aid formula are supposed to serve a similar function. The presence of these factors raises the issues, pursued later in the report, of whether per-pupil expenditure factors are valid cost proxies, whether alternative cost factors might be preferable, and whether either the same or different cost proxies should be incorporated into formulas that now contain no cost adjustments of any kind.

Mathematical Forms

The basic mathematical forms of the present fund allocation formulas are generally very simple; the complexities, which are formidable in a few instances, arise mainly out of the various constraints and associated aid proration rules that have been built into some fund distribution mechanisms. The basic formulas are discussed here, and the constraints are considered separately below.

The simplest formulas are those that distribute aid among the states in direct proportion to single need (person count) indicators. These include the formulas used to allocate funds under the Chapter 2 Block Grant, Drug-Free Schools, EHA Basic Grant, and Adult Education programs. The only complications in these cases (which are minor) arise out of provisions in some programs setting lower bounds on each state's share of the available funds.

A few formulas are one rung further up the complexity ladder in that they distribute different portions of the available funds in proportion to different need indicators. For instance, one-half the funds under the Mathematics and Science program are distributed in proportion to population 5-17 and one-half in proportion to state allocations of Chapter 1 grants to LEAs. Similarly, some funds under the EHA Preschool program are allocated in proportion to the number of handicapped children ages 3-5 served in special education, while

other funds are allocated according to the estimated year-to-year increase in the same variable. Multiple rather than single person-count factors also appear in the Impact Aid and Vocational Education formulas.

Several programs allocate funds according to the mathematical products of person-count factors and adjustment factors (i.e., multiplicative adjustment factors are applied to the person-count variables in the formulas). The Chapter 1 Grants to LEAs, Migrant Education, and Grants for the Handicapped formulas all incorporate the bounded per-pupil expenditure factor described earlier. In the Vocational Education program, the adjustment is based on the per capita income of each state, and it takes the mathematical form described in the previous discussion of fiscal capacity factors.

The Impact Aid formula is in a complexity class by itself. Basically, it allocates aid to LEAs according to counts of pupils in various "federally related" categories, with the allocation per pupil in each category being determined by applying specified weighting factors to levels of per-pupil spending in the LEA, in "comparable" LEAs, or, under some circumstances, in the state or the nation. In addition, there are several rules for prorating allocations and establishing priorities among pupil categories, depending on the level of the federal appropriation. The full set of rules is too elaborate to summarize here.

Constraints

Constraints are attached to many of the fund distribution formulas primarily for two purposes: (1) to ensure that each state receives at least a specified minimum allocation or minimum share of the available funds and (2) to cushion the effects of year-to-year changes in formula-based allocations. Such constraints create exceptions for certain states to the general proportional allocation rules established by the formulas, and in so doing they cause fund

distributions to deviate from the general principles (e.g., aid in proportion to needs) that guide the allocation processes. Whether such deviations are justified in each instance deserves careful attention.

The most common constraints are *lower bounds* on either a state's percentage share of the funds distributed under a program or on the dollar amount of each state's allotment. Allocations under four programs, Chapter 2 Block Grants, Mathematics and Science, Drug-Free Schools, and Vocational Education, are subject to the provision that no state may receive less than 1/2 of 1 percent of the available funds. The Adult Education formula sets a floor in a different manner by allocating the fixed amount of $250,000 to each state before distributing the remaining funds in proportion to that program's need indicator.[11] The Chapter 1 Concentration Grant formula establishes a dual floor for each state of either 1/4 of 1 percent of the total appropriation or $340,000 (for FY 1989).[12] A little-known feature of the Chapter 1 Basic Grant formula is that it also contains a provision setting a floor of 1/4 of 1 percent of the total appropriation for each state, but this provision was not in effect in FY 1989 because certain specified appropriation thresholds had not yet been reached; if the pertinent appropriations continue to grow, however, the Chapter 1 Basic Grant program will join the group of programs whose formula-based interstate distributions are subject to lower bounds on each state's share.[13]

The lower-bound provisions attached to the Vocational Education and Chapter 1 Concentration Grant formulas (and the latent provision in the Chapter 1 Basic Grant formula) are themselves subject to the constraint that no state shall receive, by virtue of the lower-bound rule, more than 150 percent of what it received, either in the aggregate or per pupil, in the prior year.[14]

Fund allocations under several programs are subject to *hold-harmless* rules, which stipulate that grant amounts may not fall short of amounts received in prior years or certain percentages thereof. Each county's FY 1989 allocation under the Chapter 1 Basic Grants formula had to be at least 85 percent of the previous year's amount; each state's allotment of Vocational Education Basic Grants had to be no less than what the state received in FY 1985; and each state's apportionment under the Mathematics and Science program had to be no less than the corresponding apportionment for FY 1988. Hold-harmless rules are also built into the Impact Aid formula.

Finally, allocations under the Chapter 1 Basic Grant program are subject to a "de minimus" rule, which makes otherwise eligible recipients ineligible if their formula-based allotments fall below a certain minimum size. Specifically, the rule is that an LEA or county must have at least 10 eligible children to receive a Chapter 1 Basic Grant (which corresponds to a minimum grant roughly in the $5,000 range).[15] Other programs have similar rules pertaining to distributions of funds within states, but the Chapter 1 rule, unlike these others, has minor effects on the interstate distribution of funds as well.

FORMULA DESIGN ISSUES

A full evaluation of fund allocation methods requires an empirical analysis of the actual distributions of funds as well as an assessment of the formulas themselves, but the assessment of the formulas alone is sufficient to highlight major formula design issues and to identify many policy options. This final section of Chapter 2 lays out an array of design issues.[16] Most of these are organized around the formula features and attributes described above--that is, they include issues pertaining to need indicators; to adjustments for fiscal capacity, effort, and cost; and to the mathematical forms of the fund allocation formulas and

the associated constraints. These same issues are also addressed later in light of the empirical evidence concerning fund distributions under existing and alternative formulas.

Issues Concerning the Need Indicators

Many formula design issues revolve around the question of how the states' relative needs for federally aided educational services should be measured. Because needs are now represented in the formulas exclusively by person counts, the following questions arise: In general, are person counts adequate measures of needs? Where such counts are appropriate, which persons should be counted? When should distinctions be made among subcategories of persons within the categories to be counted? What other kinds of need indicators might be used either instead of or in addition to the current person-count indicators?

"Need for educational services" is not a well-defined concept, and so more must be said about it before deciding whether it is well represented by the present types of person counts. Presumably, needs for educational services derive ultimately from that which is to be learned. An LEA's need for supplemental, or compensatory, reading instruction for the disadvantaged, for example, might be determined from the magnitude of the reading performance deficit to be overcome--for example, the LEA might have 500 disadvantaged students who, on average, fall two years below reading achievement norms. Note that this characterization of a performance deficit suggests that there are two dimensions of need to consider: the *prevalence* of an educational problem or condition (i.e., the number of pupils or persons with the problem) and the *severity* of the problem. An LEA with 500 children two years below grade level presumably has greater need than an LEA with 500 children one year below grade level, even though the number of children with the problem is the same. It follows that simple need indicators, such as counts of pupils who score below grade level in reading or, by extension,

counts of educationally or economically disadvantaged pupils, serve at best as one-dimensional proxies for a two-dimensional concept.

It does not necessarily follow that person counts are bad proxies, but how good they are depends on circumstances. When the group of intended beneficiaries of federal aid is well defined and relatively homogeneous (with respect to amounts of educational services to be provided), the count of its members may be a fine proxy, but when the boundaries of the group are vague or when the severity of problems and the cost of meeting them vary widely within the group, using a person count alone--in particular, a single, broad person count--becomes less satisfactory. The pertinent options, in such cases, include using multiple person counts to reflect variations in the nature or intensity of needs--that is, assigning differential weights to different subcategories of those counted--or supplementing the person counts with explicit measures of the severity of problems.

Two other key considerations are the specificity of the person-count indicator and the closeness of its relationship to the type of service or educational activity for which federal aid is being provided. Where an indicator is conspicuously nonspecific or unrelated to program goals, the question naturally arises of whether relative needs are being represented adequately. For instance, both the Chapter 2 Block Grant formula and the formula for the Drug-Free Schools program (as of FY 1989) allocate aid solely according to each state's school-age population, with no reference either to needs or prospects for school improvement (in the case of Chapter 2) or to the severity of drug-related problems (in the case of Drug-Free Schools). Whether more specific, more goal-related indicators can be found is an obvious issue to pursue.

Given the vast differences in scale among the educational systems of the different states (enrollments ranging from about 90,000 in the smallest states to 4.6 million in California), there is no doubt that some count of pupils or persons is needed in each formula simply to achieve a reasonable gross calibration of aid to the size of the recipient. The pertinent issues are which person counts should be included and whether need-related factors other than measures of prevalence should be added. These questions must be dealt with program by program and in relation to each program's substantive educational goals.

Consider, in light of the foregoing observations, the indicators used today in some of the major formula-grant programs. Chapter 1 Grants to LEAs are allocated mainly according to numbers of children in each county or LEA from families with incomes below the poverty line, a variable that is certainly logically related to the goal of serving disadvantaged pupils. But this indicator clearly measures prevalence only, not severity. Children "earn" the same amount of Chapter 1 money under the formula regardless of whether their family income is just at the official poverty line or only at, say, half the poverty level. Yet children from the poorest families are likely to pose more serious educational problems than children at the margin of poverty. It is at least arguable, therefore, that targeting would be improved if the formula distinguished (perhaps by assigning differential weights) among children in different low-income strata, and the possibility of doing this is a pertinent alternative to explore.

The classic and most debated Chapter 1 indicator issue, however, is not the one just mentioned, but rather the question of including an indicator of *educational* disadvantage instead of or in addition to the poverty factor in the fund distribution formula. According to the law, federal aid for the disadvantaged is to be used to serve "educationally deprived" children, regardless of their individual or family poverty. Consequently, there has always

been a strong a priori argument for distributing Chapter 1 funds at least partly according to an indicator of educational performance. The feasibility and implications of such a shift have been examined in past evaluations of the federal compensatory education program. In principle, the same alternative remains relevant and deserves analysis today, but the lack of a suitable educational performance measure, now as in the past, precludes empirical analysis of the effects of such a change in the formula.

Today, only a small fraction of Chapter 1 aid for the disadvantaged is allocated according to the concentration of poverty rather than the prevalence of poverty--specifically, according to numbers of eligible children in a county or LEA in excess of the thresholds of 6,500 or 15 percent of school-age population.[17] It has been shown that poverty concentration per se is associated with low educational performance; that is, individual students, poor or not poor, tend to do worse in schools where large percentages of the student body are poor (Kennedy, Jung, and Orland, 1986). This raises the question of whether the poverty concentration factor is now receiving due weight in the Chapter 1 formula (relative to the weight accorded to the incidence of poverty) as well as the narrower technical questions of how poverty concentration should be measured and taken into account in allocating aid.

Turning to another major ED program, the issue of how differences in the severity of needs should be treated is a matter of particular concern in distributing federal aid for education of the handicapped. Funds under the three largest handicapped programs (EHA Basic Grants, EHA Preschool Grants, and Chapter 1 Grants for the Handicapped in State-Operated Programs) are now allocated according to numbers of handicapped pupils served in special education by states or LEAs with no differentiation by handicapping condition; yet the cr [illegible] serving children with different handicaps vary drastically.[18] Many formulas used by

states to distribute education funds to LEAs take such variations into account by assigning differential weights to children with different handicapping conditions.[19] Whether the federal formulas should do something similar to reflect interstate differences in the makeup of handicapped populations is an important matter to consider, as is the empirical question of whether doing so would make a significant difference.

The issues of specificity of need indicators and relationship to program goals are important in connection with the formula for distributing Vocational Education aid among states. Under that formula, funds are allocated primarily according to state populations in the 15-19, 20-24, and 25-65 age brackets, without taking into account any more direct measures of the demand for, or cost of, vocational education services. Basing the allocations on these population counts can easily lead to wide disparities in support relative to service volume and level of nonfederal funding. For instance, under the current formula, a state that has an above-average percentage of college-bound students, and hence a smaller-than-average pool of potential vocational enrollees, might receive more aid than could be justified by its actual levels of vocational education enrollment, services, or outlays. The present population factors may be too broad and too loosely related to vocational education to be good proxies for needs. Thus the question of whether there are better, more specific measures arises.

An issue that cuts across several programs is whether need for services is best measured by population, enrollment, or counts of pupils actually receiving federally supported services. Population factors, now used in allocating aid under five programs, generally work to the disadvantage of states that enroll larger proportions of the pertinent population strata in school. For instance, under the Vocational Education and Chapter 2 Block Grant programs, states that succeed in holding down their dropout rates receive less aid per enrollee than other

states, other things being equal. Whether enrollment should be substituted for population in such cases is worth considering.

Federal funds are now allocated according to counts of pupils served only under the programs of aid for the handicapped, but the same approach is potentially applicable to other areas. The advantage of this approach is that it links aid amounts more directly to actual service levels and costs. Its potential liabilities are that it may create incentives to serve students with only marginal need for the services in question and to spread resources thinly so that larger numbers of students served can be reported. The handicapped programs incorporate safeguards against such practices that are not present elsewhere (e.g., requirements to prepare IEPs and to serve each student "appropriately"). Nevertheless, whether allocations under other programs can be improved by tying them to actual numbers of pupils served merits exploration.

Finally, a widely acknowledged shortcoming of the poverty indicator on which the Chapter 1 distributions are based (and of the population indicator on which Adult Education grants are based) is that the data needed to compute the indicator are available only from the decennial Censuses. As a result, FY 1992 and FY 1993 Chapter 1 Grants to LEAs will be distributed according to counts of low-income children in 1979. Although more current data are unavailable, there are alternatives to continued reliance on the unadjusted 10-year-old figures. One is to extrapolate the poverty indicator according to the assumption that state or county percentages of poor children, rather than absolute numbers of poor children, have remained constant over the years. Another is to adjust the counts according to state-level or regional estimates of poverty based on the Census Bureau's Current Population Surveys (CPS).[20] A third alternative (obviously a longer-term option) is to undertake special data

collection, along the lines of the Survey of Income and Education (SIE) that was conducted in the mid-1970s. The technical feasibility and desirability of such options need to be considered.

The Role of Fiscal Capacity, or Ability to Pay

Whether the varying capacities of the states to raise education revenue from their own sources should be taken into account in allocating federal aid is a major unsettled issue. Current policy is inconsistent: Funds under the Vocational Education program (and the Vocational Rehabilitation program) are distributed according to a formula that gives less aid to states with higher fiscal capacity (per capita income), but all other elementary-secondary programs allocate aid without taking income or fiscal capacity into account. The principle of distributing aid in a negative relationship to capacity has been embodied, however, in such major federal grant programs outside education as Medicaid, Aid to Families with Dependent Children (AFDC), and the former General Revenue Sharing program (GAO, 1987). The same principle is also reflected in nearly all the formulas that states use to distribute state education funds among their own local school districts.[21] No objective answer can be offered to the question of whether giving more aid to lower-capacity states is desirable. Ultimately, the issue seems to hinge on two considerations: (1) the importance to be assigned to equality (or, at least, reduced inequality) in the distribution of federally subsidized educational services and (2) the nature of the federal role, vis à vis the state and local roles, in financing each area of education in which there is a federal grant program.

To see the interplay between these considerations, suppose that there were a federal goal of making a particular educational service uniformly available to members of a specified target group throughout the United States. If this service were to be completely federally

funded (no state or local financial participation), distributing the federal funds in proportion to the number of target-group members in each state, without taking fiscal capacity into account, would be sufficient to produce the desired result.[22] But if federal funds covered only a fraction of the cost of the service, with the remaining revenue provided from state and local sources, the same method of allocating aid probably would not yield the desired nationally uniform distribution of services. High-income states would be likely to spend more of their own (nonfederal) money on the service than low-income states; federal aid, being distributed without regard to income, would not compensate for differences in nonfederal funding; and the level of support for the service, instead of being uniform, would be positively associated with income. To offset the positive relationship between income and state-local support and to make overall funding levels uniform (or more nearly so), the federal government would have to distribute its funds in a negative relationship to income. In sum, *if* equality in the provision of a federally aided service is considered desirable and *if* the federal role is to pay only part of the cost of the service rather than to finance it entirely, distributing federal aid in a negative relationship to fiscal capacity becomes the appropriate policy.

How does this principle apply (or how might it be applied) to some of the major federal aid programs? Vocational education, in which federal aid is currently distributed in a negative relationship to income, is a field in which the federal government pays only a minor fraction of program costs. Special education for the handicapped is another such field, but the distribution of federal aid for the handicapped is based solely on numbers of pupils served and does not take differences in grantees' ability to pay into account. These arrangements send a mixed message: the vocational education case seems to indicate that equalizing support for the

federally aided program is a federal objective; the special education case seems to imply that it is not.

In the field of compensatory education for the disadvantaged, the situation is less clear-cut, and the changing nature of the federal financial role needs to be taken into account. Federal aid under ESEA Title I (the precursor of the present Chapter 1 Grants to LEAs program) was originally the predominant source of funding for such services, and so the issue of equalizing for differences in nonfederal support was of little significance. But today, federal aid, although still a major source of funds for the disadvantaged, plays a less dominant role. Some states operate their own large compensatory education programs, and many states support supplementary services for disadvantaged students under other labels. Consequently, the overall level of support for such services is now likely to vary among states in relation to each state's revenue-raising ability, among other things. To equalize the resources potentially available for services to the disadvantaged, therefore, the federal government would have to distribute its Chapter 1 Grants to LEAs in a manner designed to offset differences in the states' abilities to pay for such services on their own.

Apart from promoting equality in the provision of federally supported services, another possible motive for distributing federal aid in a negative relationship to fiscal capacity is to try to reduce interstate disparities in overall education spending per pupil. Various proposals to use federal grants for this purpose have been made over the years, and the idea has recently reappeared in Congress; however, the degree of interstate equalization that could be achieved by manipulating the existing pool of federal aid (without defeating the purposes of the individual categorical programs) is quite small. To reduce interstate expenditure disparities substantially, the federal government would have to distribute billions of dollars in new funds

(presumably as general-purpose education aid) in a manner skewed sharply in favor of low-income, low-capacity states.[23]

Assuming that a decision were made to take ability to pay into account in distributing funds in areas other than vocational education, two technical issues would have to be addressed: how state fiscal capacity should be measured and how the chosen indicator should be incorporated mathematically into an aid formula. Although fiscal capacity is represented by per capita income in the Vocational Education and Vocational Rehabilitation programs (and in the noneducation grant programs mentioned earlier), income is not necessarily the most suitable indicator for this purpose. Alternatives to per capita income include per capita gross state product (GSP), which is a more comprehensive measure than income, and the Representative Tax System (RTS) and Representative Revenue System (RRS) indices of state fiscal capacity produced by the Advisory Commission on Intergovernmental Relations (ACIR).[24] How allocations would be affected by substituting each of these for per capita income is a matter of considerable interest.

In addition, the appropriateness of measuring revenue-raising ability in *per capita* terms, as with per capita income, needs to be reexamined. What matters in education, it can be argued, is each state's ability to generate revenue *per pupil* rather than per capita, which suggests that measures like income per pupil or GSP per pupil should be examined.

There are several ways to incorporate a fiscal capacity indicator into an aid formula. One method is simply to multiply the need indicator(s) in the formula by the inverse of state fiscal capacity. A second is to adhere to the method now used in the Vocational Education formula. A third is to construct a formula that adjusts for fiscal capacity and rewards fiscal effort simultaneously (this option is discussed in the immediately following section). Because

each fiscal capacity indicator could be inserted into a formula in several different ways, there are numerous alternatives to analyze under this heading.

The Potential Role of Fiscal Effort

A policy issue singled out for attention in the Congressional mandate for this study is whether states (or local agencies) should be rewarded under federal fund allocation formulas for fiscal effort to support education. Currently, effort is not taken into account in distributing federal elementary-secondary aid. Effort factors do figure prominently, however, in the formulas that some states use to distribute state aid to local school districts.[25] Like the fiscal capacity question, the fiscal effort question cannot be addressed without bringing up such broad issues as what the federal government is trying to achieve with its aid allocation mechanisms and what constitutes distributional equity.

The standard rationale for establishing a positive relationship between federal education aid and state-local fiscal effort is that doing so creates an incentive for states to devote resources to educational programs and services of interest to the federal government. Obviously, there is room for debate over whether such incentives are desirable. One side of the argument is that drawing in nonfederal funds helps to advance federal educational goals; the other side is that doing so "distorts" state and local budget priorities by diverting funds from uses that states or localities value highly to those that federal policymakers prefer. Whether the induced shift of nonfederal funds is good or bad (assuming that the incentive works) is essentially an ideological issue, because the assessment must depend ultimately on the relative value accorded to federal versus state and local preferences.

As to the equity aspect, incorporating a fiscal effort factor into an aid formula seems to imply a shift from one equity criterion to another. In the absence of a linkage of aid to

effort, the prevailing equity principle (implicit in distributing federal funds in proportion to need indicators) is "equal aid per unit of educational need." With an effort factor in the formula, this principle becomes transformed into "equal opportunity to earn federal aid by devoting state and local funds to education." Under this altered principle, all states that exert the same effort still receive equal aid per unit of need, but a state that exerts greater effort than another receives more aid per unit of need. It becomes possible, then, for a state with greater need (e.g., more pupils in a specified target group) to receive fewer federal dollars than a state with lesser need because the latter exerts greater fiscal effort to support education. Conceivably, therefore, a policy of rewarding effort may amplify fiscal and educational disparities among states, depending on the rates of effort that different states choose to exert. Whether the resulting redistribution of fiscal resources constitutes an improvement in, or a departure from, equity is in the eye of the beholder.

A sharp distinction must be made between linking federal aid to fiscal effort, as it has been defined here, and linking it to levels of state-local spending. Sometimes, making federal aid proportional to nonfederal support--that is, federal matching of state-local spending--is described as rewarding "effort," even though "effort," in that misuse of the term, refers to the *level* of expenditure or revenue rather than to the *ratio* of revenue to fiscal capacity. Tying federal aid to the former rather than to the latter could seriously impair equity in the distribution of federal funds. If the federal government matched state-local education outlay at a constant rate, for example, wealthier states, which generally spend more on education than poorer states, would receive larger federal grants; as a result, interstate disparities in spending relative to need would be exacerbated. Federal matching is compatible with fiscal equity only when it is done with variable matching rates, negatively related to state fiscal capacity.[26]

If a decision were made to reward fiscal effort, the same practical issues would have to be addressed as were discussed earlier in connection with fiscal capacity: how should fiscal effort be measured and how should it be incorporated mathematically into the formula? Because effort is the ratio of nonfederal revenue to fiscal capacity, there are two measurement issues to resolve: Which revenue variable should be used and which fiscal capacity indicator should be selected? Alternative answers to the latter question have already been discussed. The main issue with respect to the revenue variable is one of breadth: Should federal aid be allocated to reward states for supporting elementary-secondary education in general or for supporting the specific educational activities for which federal funds are being distributed? If the former, the appropriate revenue measure is total state-local revenue for elementary-secondary education; if the latter, it is state-local revenue devoted to such specific activities as education of the disadvantaged or handicapped.

In the short run, unfortunately, there is no choice to be made. Because data are not available that could be used to develop program-specific measures of fiscal effort, linking aid to state effort to support elementary-secondary education in general is the only viable short-run option. It is perhaps for this reason that the Congressional mandate for this study refers to "fiscal efforts in support of *general* elementary and secondary education" as the behavior to be rewarded.

At least two mathematical methods of rewarding fiscal effort may be considered. One is simply to multiply the basic need factor in an aid formula by relative effort (the adjustment could apply to all or a portion of the funds to be distributed).[27] The other is to borrow a formula of the guaranteed yield or guaranteed tax base (GTB) type from the field of state school finance and use it to make federal aid simultaneously an increasing function of state

fiscal effort and a decreasing function of state fiscal capacity.[28] These, along with the measurement options mentioned previously, are among the alternatives considered later in this report.

The Issue of Adjusting for Differences in Costs

Compared with the value-laden fiscal capacity and fiscal effort issues already discussed, the issue of adjusting for interstate differences in the cost of education is straightforward. Few would dispute that the unit costs of educational resources and services vary among states and that, because of such variations, equal federal aid allocations to different states do not necessarily buy equal educational services. Allocating aid equally in "real" terms would entail adjusting grant amounts to offset the cost differentials. In principle, such adjustments could be made by incorporating cost-of-education indices into the fund distribution formulas, but technically sound state-level cost indices are not available. The practical near-term issues, therefore, concern the roles of existing and alternative proxies for the relative cost of education in each state.

The principal formula factors that are considered to be cost proxies are the bounded per-pupil expenditure factors in the various Chapter 1 formulas. Taking into account that per-pupil expenditure variables also play similar roles in the Impact Aid formula, it can be said that such factors influenced the distribution of more than $5.2 billion in grants in FY 1989--more than half the elementary-secondary total.[29] Among the issues raised by the expenditure factors are (1) whether they are valid proxies for costs, (2) whether superior cost indicators are available or can be developed, and (3) whether either the per-pupil expenditure factors or some other cost factors should be incorporated into grant formulas that now contain no cost-related factors at all.

The theoretical basis for treating a per-pupil expenditure factor as a proxy for cost is shaky. It is true that high-cost states, other things being equal, tend to spend more per pupil, and so per-pupil outlays and costs are positively correlated. But rough proportionality, not simply a positive correlation, is needed for one variable to serve as a good proxy for another. The conceptual problem is that other things are not equal; per-pupil spending varies among states not only because of cost differences but also because of differences in fiscal capacity and willingness to support education. Using an expenditure variable confounds differences in costs of educational resources with differences in state fiscal capacity and effort. The most likely effects of including the current per-pupil expenditure factor in the formula, therefore, are partly to offset differences in costs but partly to skew the federal aid distribution in favor of states that spend above-average amounts on education either because they are wealthy or because their tastes for education are particularly strong. The latter effects are hard to defend on equity grounds. The bounds on the current Chapter 1 per-pupil expenditure factor (only a range from 80 to 120 percent of the national average is permitted) limit but do not eliminate the tendency to shift funds in favor of higher-income, higher-spending states.

Although it is not possible to test the per-pupil expenditure variable against an ideal cost-of-education index, it is possible to compare it with alternative proxies that bear stronger logical relationships to educational costs. These alternatives include indices of average teacher salary and general wage levels in each state. For example, state scores on a "true" cost-of-education index would probably deviate somewhat less from the national mean than scores on an index of average teacher salary, and so comparing an index of average teacher salary with the per-pupil expenditure factor should yield information on whether the latter has the desired general properties.[30]

A much narrower issue that has recently been raised about the per-pupil expenditure factor is whether it is being measured in a technically sound manner. The ED Office of Inspector General (IG) contends in a recent study (U.S. Department of Education, Office of Inspector General, 1989) that measuring per-pupil expenditure as expenditure per pupil in average daily attendance (ADA) creates inequities and distorts the distribution of Chapter 1 funds among states. As the IG report notes, states are not now required to report ADA according to a standard definition but are free to use definitions of their own; consequently, the reported ADA figures are not fully comparable across states. The IG recommends substitution of a different expenditure measure, expenditure per pupil enrolled, for the present formula factor. How this substitution would affect the Chapter 1 distribution is a question to be addressed in the analysis of alternative formulas.

Issues Pertaining to Mathematical Forms and Constraints

There is little to say about the mathematical forms of the current formulas because, for the most part, they simply distribute federal money in proportion to one or more person-count variables. Some technical issues do arise in the relatively few cases where multifactor formulas are used. For instance, the rationale for allocating separate portions of aid according to separate need indicators (as in the Mathematics and Science and Vocational Education programs) rather than allocating all aid according to a weighted sum of indicators merits some discussion, but this point is relatively minor. The mathematical methods used to incorporate adjustment factors into the formulas are matters of some concern, but they have already been discussed. Hence the remaining issues concern the rationales for, and equity implications of, the formula constraints.

Lower Bounds. The constraint most often appended to the allocation formulas covered by this report is a lower bound on either a state's percentage share of the funds available for a program (most often 1/2 of 1 percent of the national total) or on the dollar amount of its allotment. The usual rationale for such aid floors is that a certain minimum level of funding--a "critical mass"--is essential to conduct the educational activity in question. Where that activity is a unitary, statewide one, this justification makes sense. For example, the Perkins Vocational Education Act provides funds to operate state councils on vocational education--one per state--and provides at least $120,000 to support each such council. Having a lower bound in this instance is hard to quarrel with, because presumably a certain minimum budget is needed to operate a council no matter how small the state. Trying to extend the same rationale to programs such as Chapter 2 Block Grants, Mathematics and Science, Drug-Free Schools, and Vocational Education Basic Grants, however, is a dubious enterprise. Under these programs (all of which are subject to the 1/2 of 1 percent floor), federal funds are parceled out in small amounts to LEAs and other local recipients. That a state has only, say, 1/5 of 1 percent of the U.S. population and would receive a correspondingly small share of federal aid in the absence of the aid floor does not necessarily mean that its awards to individual local grantees would be any smaller, on average, than those made by states with aggregate allotments 10 or 20 times as large. In the absence of demonstrable indivisibilities or diseconomies of small scale, all that can be said about the lower-bound provisions is that they direct more aid per pupil to small states than to larger ones. Whether this practice should continue, and what the effects would be of altering the constraints, are significant issues to consider.

Hold-Harmless Rules. Constraints of the "hold harmless" type, those precluding or limiting decreases in state aid allotments below the levels of previous years, are usually justified as devices for cushioning the shock of shifts in formula-based allotments and preventing abrupt cutbacks or terminations of educational programs. A sharp distinction must be made, however, between provisions that limit the rate of decline (e.g., the Chapter 1 rule that no county may receive less than 85 percent of its prior-year Basic Grant allocation) and those that hold allocations constant indefinitely (e.g., the provision in the Vocational Education formula guaranteeing each state at least as much aid as it received in FY 1985). The former serve as transition rules, while the latter hold allocations fixed at levels that the states' relative educational needs no longer justify. Modifying or deleting such rules, or perhaps adding transitional rules where they are not now present, are among the alternatives that need to be considered.

* * * * *

Our ability to analyze some of the aforementioned formula design issues and alternatives is limited by gaps in, or weaknesses of, the data. In some cases, there are no satisfactory state-by-state data (or sometimes, no data at all) to represent factors that may seem desirable, on logical grounds, to include in grant formulas. For instance, no measures of the incidence of low educational performance in each state are available. It remains, useful, nevertheless, to examine such alternatives from a theoretical perspective, even when their effects cannot be demonstrated numerically. Both empirical and theoretical analyses of alternatives are presented in Chapter 4. First, however, Chapter 3 provides the necessary

foundation for the analysis of alternatives by presenting detailed descriptive statistics on the existing interstate distributions of federal funds.

Notes

1. The statute stipulates that 50, 20, and 15 percent of the available funds, respectively, should be allocated according to populations in the 15-19, 20-24, and 25-65 age brackets and that the remaining 15 percent should be allocated in proportion to the resulting allotments. This computational procedure is equivalent to assigning weights to the aforesaid three age ranges of .5882, .2353, and .1765, respectively.

2. Funds under the Concentration Grant component of the Chapter 1 formula are allocated partly according to the same count of eligibles, but the allocation to each county also depends on whether, and by how much, the number of eligibles in each county exceeds certain specified thresholds. See Table 3 for details.

3. The class of eligible migrant children, according to the statute, includes children ages 3-21 who are either currently or formerly migrant. The latter category includes children who were migrants up to 5 years in the past.

4. The most important categories of such children are those whose parents live or work on military bases or other such federal facilities and Indian children whose families live on Indian reservations.

5. Note that children in the 3-5 age range are counted under both the EHA Basic Grants and EHA Preschool Grant formulas--that is, the latter program provides extra federal support for handicapped preschoolers already aided under the former.

6. To be precise, the per capita income variable used in this computation is defined as the average of each state's per capita personal incomes in the three most recent years for which data are available.

7. Although the adjustment factor is computed in the same way for the Vocational Rehabilitation program, it is allowed in that case to vary from 0.333 to 0.75, as compared with 0.4 to 0.6 under the vocational education program. The result is a slightly stronger negative relationship in Vocational Rehabilitation than in Vocational Education between federal aid and state per capita income.

8. The problems of developing cost-of-education indices are discussed in a literature review by Barro (1981).

9. That the purpose of including the per-pupil expenditure factor in the Chapter 1 formula was to reflect interstate variations in costs of education is clear from the legislative history (see, e.g., Ginsburg, Noell, and Rosenthal, 1985). The per-pupil expenditure factor is also identified as a "unit cost factor" in the General Accounting Office's catalog of federal aid formulas (GAO, 1987).

10. To be precise, the Chapter 1 per-pupil expenditure factor is defined in the statute as 40 percent of expenditure per pupil in ADA but not less than 80 percent or more than 120 percent of the average value of the same variable for the whole U.S. The 40 percent factor serves no function in the formula, however, as it cancels out when allocations are prorated to conform to the actual appropriation ceiling.

11. The floor, in this instance, is not $250,000 but rather $250,000 plus a fraction of the remaining funds corresponding to the smallest state share of the U.S. population of persons over age 16 without high school diplomas. This minimum works out to about $378,000 for FY 1989 (Alaska), or 0.28 percent of the total amount to be distributed.

12. The general rule is that each state receives the larger of the two amounts; however, this rule is qualified by a restriction, applicable in certain cases, on the amount a state may receive under the 1/4 of 1 percent provision (see Table 3). The result is that some states receive 1/4 of 1 percent of the available funds ($432,250 in FY 1989); some receive the $340,000; and a few receive amounts in between.

13. P.L. 100-297, Sec. 1005(e) stipulates that the provision for a 1/4 of 1 percent floor will be effective when (1) the appropriation for Chapter 1 Basic Grants exceeds the FY 1988 appropriation by at least $700,000,000, (2) the appropriation for Concentration Grants is at least $400,000,000, and (3) all states receive at least as much Chapter 1 aid as they received in FY 1988.

14. Specifically, in Vocational Education, this 150 percent limit applies to a state's aggregate aid allotment. Under the Concentration Grant program, no state may receive, by virtue of the lower-bound provision, more aid *per pupil* counted for the purpose of apportioning concentration grants in the previous year than 150 percent of the current year's national-average per-pupil payment under the Concentration Grant program. Under the Chapter 1 Basic Grant formula, the rule (so far dormant) is that no state benefiting from the lower-bound provision may receive more than the lesser of (1) 150 percent of the amount it received in the previous year or (2) 150 percent of the national-average per-pupil payment in the current year for each pupil counted for the purpose of apportioning Basic Grants in the prior year.

15. The requirement to have 10 or more children applies to individual LEAs when data are available to allocate funds directly to LEAs under the Chapter 1 Basic Grant formula (this occurs mainly where LEAs are coterminous with counties). Otherwise, the requirement to have 10 or more children applies to whole counties. An LEA with fewer than 10 low-income children is eligible for a grant if it is located in a county with at least 10 eligible children.

16. Some material in this section derives from the author's earlier study, *Federalism, Equity, and the Distribution of Federal Education Grants* (Barro, 1983).

17. The share of funds allocated according to poverty concentration was 4.3 percent in FY 1989, but this figure has been raised to 8.2 percent for FY 1990.

18. For estimates of the costs of providing special education to children with different handicapping conditions, see Kakalik, Furry, Thomas, and Carney (1981) and Moore, Strang, Schwartz, and Braddock (1988).

19. A compendium of state school finance formulas produced by Salmon et al. (1988) provides multiple examples of states that assign differential weights in their funding formulas to pupils with different handicapping conditions. For example, in 1986-87, Florida recognized cost differentials among 15 categories of exceptional children, Indiana distinguished among 14 such categories, and Delaware among 12.

20. A set of child poverty estimates for the mid-1980s, based on CPS data, has recently been published by the Children's Defense Fund (1990), but the reliability of these estimates is questionable, especially for the smaller states.

21. Because school districts raise local revenue mainly from property taxes, the indicator of local revenue-raising ability, or fiscal capacity, used in most state education aid formulas is the assessed value of taxable property per pupil; however, some state aid formulas also take local per capita income into account. For details, see the descriptions of individual state school finance formulas in Salmon et al. (1988).

22. There would still be a role for cost adjustments to make the distribution of funds equal in real rather than just in nominal terms. See the discussion of differences in the cost of education later in this chapter.

23. Barro (1990) shows that it would have taken about $12 billion in federal general-purpose aid, distributed in the most drastically equalizing manner possible (i.e., entirely to states with below-average fiscal capacities), to bring expenditure per pupil in all states up to the level of the state containing the median pupil. However, this calculation does not take into account interstate differences in education costs, which may reduce substantially the amount of redistribution required to equalize real education spending per pupil.

24. Data on gross state product have been published by the Bureau of Economic Analysis, U.S. Department of Commerce, for years up to 1986, and updated figures are being prepared. The most recent published RTS and RRS capacity indices are also for 1986 (ACIR, 1989), but estimates for 1988 are forthcoming.

25. The principle of allocating funds according to fiscal effort (most often represented by the local property tax rate) underlies the state school finance systems variously known as "percentage equalizing," "power equalizing," "guaranteed yield," and "guaranteed tax base." These formulas became widely used during the school finance reform movement of the 1970s and are now among the principal methods used by states to distribute general-purpose education aid to local districts (see Barro, 1987; Salmon, 1988).

26. The state school finance formulas that link aid to fiscal effort (such as the guaranteed yield and power equalizing formulas mentioned in note 25) can also be described as "variable matching" formulas because each allocates aid in amounts that match spending by local districts but at rates inversely related to each district's fiscal capacity.

27. For instance, one could incorporate an effort factor into the Chapter 2 Block Grant formula simply by multiplying the basic need factor in the formula, population 5-17, by the effort measure; or, to moderate the influence of effort, one might allocate perhaps half the available funds according to population 5-17 multiplied by effort and the other half according to population 5-17 only.

28. Such a formula could, for example, involve allocation of federal aid according to POP x EFFORT x (CAPSTD - CAP), where POP is population (or, more generally, a need indicator), EFFORT is the chosen measure of fiscal effort, CAP is a state's fiscal capacity, and CAPSTD is some standard measure of capacity, such as the capacity of the highest-capacity state. Under this formula, aid per unit of need is proportional to effort and to the *gap* between a particular state's fiscal capacity and the level of fiscal capacity chosen as the standard.

29. The $5.2 billion figure, which is for FY 1989, includes not only the various Chapter 1 grants but also the Mathematics and Science grants, which are allocated partly according to Chapter 1 allocations, and Impact Aid funds, which are allocated according to per-pupil expenditure factors of their own.

30. Stated briefly, the reason why one might expect a true cost-of-education index to deviate less from the national mean than an index of average teacher salary is that the latter reflects quality-related as well as price-related variations in average salaries. For example, a wealthy state might pay its teachers 25 percent more, on average, than teachers are paid nationally, but above-average teacher qualifications might account for 10 percent points of this salary differential and above-average salary levels only for the remaining 15 percentage points. The true price of *equivalent* teachers in the state, therefore, would be 115 percent--not 125 percent--of the national average.

3. FUND DISTRIBUTIONS UNDER THE EXISTING FORMULAS

The focus of the inquiry now shifts from distributional methods to distributional outcomes. This chapter provides a detailed analysis of allocations of federal funds under the major ED elementary-secondary education grant programs in FY 1989.[1] It presents tabulations of state-by-state allocations and summaries of fund distribution patterns, statistics on interstate variations in aid per pupil, an analysis of regional patterns in the distribution of education aid, analyses of associations between levels of funding and pertinent state characteristics, and program-by-program explanations of the relationships between grant formula designs and the observed distributions of funds among the states.

A NOTE ON THE FEDERAL FUNDS DATA

All data on amounts of federal aid presented in this report pertain to allocations of appropriated funds (budget authority), as distinct from either obligations or expenditures. Both the differences among these concepts and the reasons for selecting allocations are worth noting. Allocations are the amounts that federal officials compute for each state (or, in some cases, for each local grantee) by applying the statutory formulas to the total funds that Congress appropriates for a program in a particular fiscal year. The amounts allocated are not necessarily the amounts that the federal government actually awards (obligates) to states in the same or the succeeding fiscal year; nor do they necessarily correspond to what the federal government expends in any one fiscal year. Both obligations and expenditures lag behind allocations, but the lags are not necessarily uniform across states. Funds allocated in one fiscal year may be awarded to some states in the same year and to other states in the following year. Obligations and allocations may also differ for administrative reasons; for instance, funds may be withheld because a state or a local agency has not fulfilled all the

conditions of eligibility for a grant, or a state may choose not to participate in all or part of a program. Federal expenditures occur only as states use their grants and claim and receive federal payments. Thus, allocations, obligations, and expenditures need not be distributed identically across states in any given time period.

The main positive reason for focusing on allocations is that this study is intended primarily to assess existing and alternative fund distribution formulas, and it is allocations--not obligations or expenditures--that are the direct outputs of formula-based distribution processes. In addition, allocations were chosen because the two alternative measures, obligations and expenditures, have significant shortcomings. Comparisons of obligations can be misleading because of the previously mentioned vagaries in the timing of grant awards.[2] Expenditure comparisons can also be distorted by interstate differences in the timing of outlays and claims for payment. A more serious problem is that expenditure data by program and by state are not readily available. The raw expenditure data apparently exist in the ED Finance Service's data processing system, but compiling them in the required categories would be a massive job and the reliability of the results would be uncertain.[3] The allocation data, in contrast, are available in immediately usable form. Thus a combination of positive attributes of allocations and negative attributes of the alternatives led us to focus on the former throughout this study.

The FY 1989 allocation data presented in this chapter, obtained from the ED Budget Service, were prepared by budget analysts responsible for the individual grant programs. These data generally correspond to the actual FY 1989 budget authority figures reported in ED's FY 1991 Budget Justification (U.S. Department of Education, 1990).[4] They also correspond to data provided by the National Center for Education Statistics (NCES), which is responsible for calculating certified state-by-state allocation figures according to the statutory

formulas. An important exception is that state-by-state allocations under the Impact Aid program are neither calculated by NCES nor reported in the ED Budget Justification, perhaps because Impact Aid funds are distributed directly to individual LEAs rather than to or through states. Impact Aid allocations also are not "final" or "actual" in the same sense as the others but are subject to reallocation and adjustment over a period of years following the year in which funds were appropriated. They are not fully comparable, therefore, to allocations reported for the other programs.

STATE-BY-STATE ALLOCATIONS OF AID

The FY 1989 distributions of aid among states under the 11 major formula-grant programs are displayed in different forms in Tables 4 through 7. These tables cover not only the allocations to the 50 states and the District of Columbia but also allocations to Puerto Rico and other outlying areas of the United States.[5] Each table also provides totals or averages for the 11 major elementary-secondary grant programs combined.

Table 4 presents what might be called the basic facts on fund distributions to the states--the absolute dollar amounts of federal aid allocated to each state under each major grant program. This table conveys at a glance a strong impression of the gross differences in the scale of federal aid to different states. California, the largest recipient of education grants, was allocated $892 million in FY 1989--10.3 percent of all funds distributed under the 11 programs covered by the table. In contrast, small states like Delaware, Vermont, and Wyoming each received aid in the neighborhood of $25 million--less than 1/35 as much. These relative allotments do not seem out of line, considering that California has 11.5 percent of the nation's elementary and secondary enrollment, compared with only about 0.25 percent for each of the aforementioned small states, but the comparison makes clear why data on

Table 4

Federal Aid Allocations by Program and by State, Fiscal Year 1989
(Allocations in thousands of dollars)

State	Chapter 1 Grants to LEAs	Migrant Education	Chapter 2 Block Grants	Mathematics and Science	Drug-Free Schools	Impact Aid	EHA Basic Grants	EHA Preschool Grants	Chapter 1 Grants for the Handicapped	Vocational Education Basic Grants	Adult Education	Total: 11 Programs
Alabama	86,147	1,821	7,969	2,261	4,933	6,263	34,179	9,745	281	16,375	2,777	172,750
Alaska	6,886	7,009	2,296	635	1,421	74,261	4,077	573	1,834	4,121	378	103,491
Arizona	44,471	6,771	6,127	1,499	3,793	57,311	17,889	2,426	702	11,335	1,487	153,812
Arkansas	47,942	4,064	4,605	1,386	2,851	2,275	14,735	3,524	1,466	9,283	1,782	93,911
California	396,257	87,103	48,473	13,446	30,008	65,537	142,603	24,007	1,612	72,293	11,001	892,339
Colorado	36,364	2,337	5,865	1,407	3,631	7,363	16,117	1,925	2,661	10,125	1,343	89,139
Connecticut	42,899	2,277	5,264	1,413	3,259	6,559	20,085	2,367	2,961	8,224	1,773	97,081
Delaware	11,639	678	2,296	635	1,421	38	3,458	95	2,251	4,121	547	27,180
District of Columbia	18,276	69	2,296	635	1,421	4,373	991	352	2,702	4,121	605	35,841
Florida	168,118	23,173	18,342	5,313	11,355	12,968	66,660	4,039	4,015	34,735	5,631	354,349
Georgia	114,215	2,645	12,205	3,234	7,556	7,398	30,326	6,457	1,382	23,016	3,794	212,228
Hawaii	11,967	0	2,296	635	1,421	21,596	3,933	561	231	4,121	650	47,412
Idaho	11,962	3,243	2,296	635	1,421	4,817	6,423	5,712	85	4,121	648	41,363
Illinois	188,824	1,912	21,076	5,841	13,047	10,893	68,499	13,392	22,369	34,726	6,291	386,890
Indiana	61,864	908	10,470	2,502	6,482	1,693	33,504	1,781	4 454	20,169	3,135	146,960
Iowa	33,674	88	5,196	1,264	3,217	182	18,730	2,744	700	9,671	1,589	77,054
Kansas	26,049	3,761	4,440	1,073	2,749	10,093	13,690	2,689	1,394	7,670	1,289	74,897
Kentucky	71,858	1,879	7,155	2,034	4,429	1,082	24,368	5,625	1,494	14,937	2,787	137,647
Louisiana	95,745	3,566	9,016	2,705	5,581	8,341	21,721	4,205	1,783	17,762	2,839	173,264
Maine	18,962	3,339	2,296	635	1,421	3,135	9,026	1,662	611	4,378	815	46,281
Maryland	67,158	398	7,678	2,056	4,755	7,737	29,172	4,546	1,258	13,039	2,459	140,254
Massachusetts	93,218	4,660	9,181	2,816	5,683	10,773	44,595	5,514	10,653	17,324	2,877	207,294
Michigan	154,593	9,151	17,402	4,829	10,773	6,523	49,898	6,567	8,009	31,283	4,911	303,939
Minnesota	48,227	1,905	7,639	1,804	4,729	5,089	27,037	4,434	251	13,438	2,026	116,579
Mississippi	77,692	1,943	5,623	1,858	3,481	3,907	19,467	2,182	380	10,898	1,902	129,332
Missouri	65,940	782	9,113	2,192	5,641	6,099	32,709	1,734	1,178	16,877	3,056	145,322
Montana	12,119	345	2,296	635	1,421	23,154	5,022	782	428	4,121	584	50,908
Nebraska	19,396	391	2,928	694	1,812	8,902	10,385	1,333	150	5,305	924	52,221
Nevada	7,479	587	2,296	635	1,421	3,438	5,157	478	289	4,121	592	26,492
New Hampshire	9,545	112	2,296	635	1,421	2,697	5,551	594	546	4,121	667	28,184
New Jersey	132,113	1,773	12,777	3,712	7,910	11,998	56,260	7,738	3,948	19,677	4,119	262,025
New Mexico	31,645	1,248	3,025	853	1,872	37,465	10,445	792	125	5,913	886	94,270
New York	430,300	5,769	30,179	10,506	18,683	11,002	86,437	26,042	22,527	51,362	9,720	702,525
North Carolina	94,421	2,484	11,527	2,983	7,136	9,023	37,107	6,739	1,180	24,799	4,220	201,619
North Dakota	8,883	606	2,296	635	1,421	9,312	4,004	855	329	4,121	575	33,036
Ohio	137,408	1,327	20,000	4,859	12,381	4,523	63,637	3,663	4,700	36,841	5,870	295,208
Oklahoma	39,380	992	6,156	1,460	3,811	24,673	21,094	2,659	408	12,045	1,872	114,550
Oregon	32,408	7,524	4,809	1,296	2,977	3,156	15,178	1,004	4,811	8,990	1,354	83,507
Pennsylvania	194,578	2,378	20,048	5,836	12,411	3,088	63,479	15,755	14,270	38,550	6,785	377,179
Rhode Island	15,328	129	2,296	635	1,421	2,753	6,412	478	596	4,121	821	34,990
South Carolina	62,820	278	6,641	1,810	4,111	7,423	25,056	4,629	419	14,080	2,351	129,619
South Dakota	12,248	59	2,296	635	1,421	14,328	4,643	969	214	4,121	590	41,525
Tennessee	84,399	176	8,948	2,438	5,539	3,245	33,579	4,587	620	18,726	3,292	165,552
Texas	261,325	45,152	33,756	9,125	20,897	27,015	103,522	12,530	6,174	58,865	8,437	586,797
Utah	14,242	658	4,314	962	2,671	9,535	13,754	1,731	935	6,635	723	56,159
Vermont	8,586	708	2,296	635	1,421	6	3,393	253	1,638	4,121	484	23,542
Virginia	80,057	371	10,063	2,529	6,230	37,763	38,292	9,131	856	18,603	3,394	207,289
Washington	46,285	11,484	8,017	1,980	4,963	26,890	24,364	7,939	2,091	13,990	1,880	149,883
West Virginia	37,953	41	3,616	1,034	2,239	62	14,490	1,790	788	7,480	1,532	71,025
Wisconsin	59,710	785	8,851	2,107	5,479	5,931	25,519	4,872	1,934	16,349	2,514	134,052
Wyoming	5,106	268	2,296	635	1,421	7,059	3,238	287	777	4,121	425	25,635
50 States + D.C.	3,838,679	261,125	450,637	124,011	278,972	640,744	1,433,913	236,482	147,490	809,343	133,006	8,354,401
Puerto Rico	149,271	2,758	8,535	3,055	5,283	483	11,755	1,925	259	14,850	2,775	200,949
Other Territories	38,150	37	3,806	1,373	3,475	2,349	29,781	424	451	1,408	563	81,817
Total	4,026,100	263,920	462, 77	128,440	287,730	643,576	1,475,449	238,830	148,200	825,600	136,344	8,637,166

absolute dollar allotments are not helpful in analyzing the distribution of aid. The gross scale effect swamps all other interstate differences. To compare allocations meaningfully, it is important to eliminate the scale factor by expressing each state's allocation relative to its elementary-secondary enrollment or its school-age population.

Tables 5 and 6 present allocations per public school pupil and per school-age child, respectively. Each entry in Table 5 is equal to the corresponding entry in Table 4 divided by K-12 public school enrollment in the state in the fall of 1988, and each entry in Table 6 is equal to the corresponding figure from Table 4 divided by the state's population, ages 5-17, in 1988. These tables, unlike Table 4, make clear which states are receiving larger and smaller allotments of federal aid relative to the sizes of their educational systems. As can be seen from the last column of Table 5, total federal aid per K-12 public enrollee under the 11 major grant programs combined in FY 1989 varied from about $130 in Utah to $335 in Montana--a ratio of about 2.6 to 1 (excluding Alaska and the District of Columbia, which receive higher allotments for special reasons). Similarly, according to the final column of Table 6, aid per school-age person varied from $126 to $318 (again, excluding the District of Columbia and Alaska), or by a factor of 2.5. The reason that the figures in Table 6 are smaller is, of course, that there are more school-age children than public school enrollees in a state, and so each dollar of aid per public school pupil translates into less than a dollar of aid per school-age child.

Among the individual programs, by far the largest interstate differences in per-pupil allocations are found in Impact Aid and the next largest in the Migrant Education program, both of which allocate funds according to "needs" that are extremely unevenly distributed geographically. The smallest interstate differences are found in such programs as Chapter 2

Table 5

Federal Aid Per K-12 Public School Enrollee by Program and by State, Fiscal Year 1989 ($)

State	Chapter 1 Grants to LEAs	Migrant Education	Chapter 2 Block Grants	Mathematics and Science	Drug-Free Schools	Impact Aid	EHA Basic Grants	EHA Preschool Grants	Chapter 1 Grants for the Handicapped	Vocational Education Basic Grants	Adult Education	Total: 11 Programs
Alabama	118.86	2.51	11.00	3.12	6.81	8.64	47.16	13.45	0.39	22.5[illegible]	3.83	238.36
Alaska	64.67	65.83	21.56	5.97	13.35	697.41	38.29	5.38	17.23	38.7	3.55	971.92
Arizona	77.36	11.78	10.66	2.61	6.60	99.69	31.12	4.22	1.22	19.7[illegible]	2.59	267.55
Arkansas	109.86	9.31	10.55	3.18	6.53	5.21	33.77	8.08	3.36	21.27	4.08	215.20
California	85.80	18.86	10.50	2.91	6.50	14.19	30.88	5.20	0.35	15.65	2.38	193.23
Colorado	64.93	4.17	10.47	2.51	6.48	13.15	20.78	3.44	4.75	18.08	2.40	159.15
Connecticut	92.56	4.91	11.36	3.05	7.03	14.15	43.33	5.11	6.39	17.74	3.82	209.46
Delaware	120.39	7.01	23.75	6.57	14.70	0.39	35.77	0.98	23.29	42.63	5.66	281.14
District of Columbia	215.54	0.81	27.08	7.49	16.76	51.58	11.69	4.15	31.87	48.60	7.13	422.70
Florida	97.69	13.47	10.66	3.09	6.60	7.54	38.73	2.35	2.33	20.18	3.27	205.91
Georgia	103.08	2.39	11.02	2.92	6.82	6.68	27.37	5.83	1.25	20.77	3.42	191.54
Hawaii	71.45	0.00	13.71	3.79	8.49	128.94	23.48	3.35	1.38	24.60	3.88	283.08
Idaho	55.73	15.11	10.70	2.96	6.62	22.44	29.93	26.61	0.39	19.20	3.02	192.73
Illinois	105.20	1.07	11.74	3.25	7.27	6.07	38.16	7.46	12.47	19.35	3.50	215.55
Indiana	64.37	0.94	10.90	2.60	6.74	1.76	34.86	1.85	4.63	20.99	3.26	152.93
Iowa	70.42	0.18	10.87	2.64	6.73	0.38	39.17	5.74	1.46	20.22	3.32	161.13
Kansas	61.06	8.82	10.41	2.52	6.44	23.66	32.09	6.30	3.27	17.98	3.02	175.57
Kentucky	112.70	2.95	11.22	3.19	6.95	1.70	38.22	8.82	2.34	23.43	4.37	215.87
Louisiana	121.71	4.53	11.46	3.44	7.09	10.60	27.61	5.35	2.27	22.58	3.61	220.25
Maine	89.06	15.69	10.78	2.98	6.68	14.73	42.39	7.81	2.87	20.56	3.83	217.38
Maryland	97.48	0.58	11.14	2.98	6.90	11.23	42.34	6.60	1.83	18.93	3.57	203.58
Massachusetts	113.21	5.66	11.15	3.42	6.90	13.08	54.16	6.70	12.94	21.04	3.49	251.74
Michigan	97.67	5.78	10.99	3.05	6.81	4.12	31.53	4.15	5.06	19.76	3.10	192.03
Minnesota	66.34	2.62	10.51	2.48	6.51	7.00	37.19	6.10	0.35	18.49	2.79	160.37
Mississippi	154.36	3.86	11.17	3.69	6.92	7.76	38.68	4.33	0.75	21.65	3.78	256.96
Missouri	81.75	0.97	11.30	2.72	6.99	7.56	40.55	2.[illegible]5	1.46	20.92	3.79	180.16
Montana	79.63	2.27	15.09	4.17	9.34	152.13	33.00	5.14	2.81	27.08	3.84	334.50
Nebraska	71.99	1.45	10.87	2.57	6.73	33.04	38.55	4.95	0.56	19.69	3.43	193.82
Nevada	42.38	3.32	13.01	3.60	8.05	19.48	29.22	2.71	1.64	23.35	3.35	150.12
New Hampshire	56.34	0.66	13.55	3.75	8.39	15.92	32.76	3.50	3.22	24.32	3.94	166.36
New Jersey	122.23	1.64	11.82	3.43	7.32	11.10	52.05	7.16	3.65	18.20	3.81	242.42
New Mexico	108.22	4.27	10.34	2.92	6.40	128.12	35.72	2.71	0.43	20.22	3.03	322.37
New York	167.19	2.24	11.73	4.08	7.26	4.27	33.58	10.12	8.75	19.96	3.78	272.96
North Carolina	87.17	2.29	10.64	2.75	6.59	8.33	34.26	6.22	1.09	22.89	3.90	186.14
North Dakota	74.77	5.10	19.32	5.35	11.96	78.37	33.70	7.20	2.77	34.69	4.84	278.06
Ohio	77.26	0.75	11.25	2.73	6.96	2.54	35.78	2.06	2.64	20.71	3.30	165.98
Oklahoma	67.85	1.71	10.61	2.52	6.57	42.51	36.34	4.58	0.70	20.75	3.23	197.36
Oregon	70.19	16.29	10.41	2.81	6.45	6.83	32.87	2.17	10.42	19.47	2.93	180.85
Pennsylvania	117.24	1.43	12.08	3.52	7.48	1.86	38.25	9.49	8.60	23.23	4.09	227.26
Rhode Island	114.74	0.97	17.19	4.76	10.64	20.61	48.00	3.58	4.46	30.85	6.15	261.93
South Carolina	102.02	0.45	10.78	2.94	6.38	12.06	40.69	7.52	0.68	22.87	3.82	210.50
South Dakota	96.51	0.47	18.09	5.01	11.20	112.90	36.59	7.64	1.68	32.47	4.65	327.20
Tennessee	102.73	0.21	10.89	2.97	6.74	3.95	40.87	5.58	0.76	22.79	4.01	201.50
Texas	79.58	13.75	10.28	2.78	6.36	8.23	31.53	3.82	1.88	17.93	2 57	178.70
Utah	33.03	1.53	10.01	2.23	6.19	22.12	31.90	4.01	2.17	15.39	1.68	130.26
Vermont	91.86	7.58	24.56	6.80	15.21	0.07	36.31	2.71	17.52	44.09	5.18	251.88
Virginia	81.49	0.38	10.24	2.57	6.34	38.44	38.98	9.29	0.87	18.94	3.46	211.00
Washington	58.52	14.52	10.14	2.50	6.28	34.00	30.80	10.04	2.64	17.69	2.38	189.51
West Virginia	112.99	0.12	10.76	3.08	6.66	0.19	43.14	5.33	2.35	22.27	4.56	211.44
Wisconsin	77.06	1.01	11.42	2.72	7.07	7.65	32.93	6.29	2.50	21.10	3.24	173.00
Wyoming	52.21	2.74	23.48	6.50	14.53	72.18	33.11	2.94	7.95	42.14	4.35	262.13
50 States + D.C.	95.51	6.50	11.21	3.09	6.94	15.94	35.68	5.88	3.67	20.14	3.31	207.86
Puerto Rico	225.59	4.17	12.90	4.62	7.98	0.73	17.77	2.9[illegible]	0.39	22.44	4.19	303.69
Other Territories	126.10	0.55	47.86	9.65	48.83	34.86	162.51	5.26	6.69	19.93	8.09	470.34
Total	97.66	6.45	11.30	3.12	7.03	15.73	35.60	5.83	3.62	20.17	3.33	209.85

Table 6

Federal Aid per School-Age Child (Ages 5-17)
by Program and by State, Fiscal Year 1989
($)

State	Chapter 1 Grants to LEAs	Migrant Education	Chapter 2 Block Grants	Mathematics and Science	Drug-Free Schools	Impact Aid	EHA Basic Grants	EHA Preschool Grants	Chapter 1 Grants for the Handicapped	Vocational Education Basic Grants	Adult Education	Total: 11 Programs
Alabama	104.80	2.21	9.69	2.75	6.00	7.62	41.58	11.85	0.34	19.92	3.38	210
Alaska	61.48	62.58	20.50	5.67	12.69	663.04	36.40	5.11	16.38	36.79	3.38	924
Arizona	70.37	10.71	9.69	2.37	6.00	90.68	28.31	3.84	1.11	17.94	2.35	243
Arkansas	100.93	8.56	9.69	2.92	6.00	4.79	31.02	7.42	3.09	19.54	3.75	198
California	79.25	17.42	9.69	2.69	6.00	13.11	28.52	4.80	0.32	14.46	2.20	178
Colorado	60.11	3.86	9.69	2.33	6.00	12.17	26.64	3.18	4.40	16.74	2.22	147
Connecticut	79.00	4.19	9.69	2.60	6.00	12.08	36.99	4.36	5.45	15.15	3.26	179
Delaware	101.21	5.89	19.96	5.52	12.36	0.33	30.07	0.82	19.58	35.83	4.76	236
District of Columbia	203.07	0.76	25.51	7.06	15.79	48.59	11.01	3.91	30.02	45.79	6.72	398
Florida	88.86	12.25	9.69	2.81	6.00	6.85	35.23	2.13	2.12	18.36	2.98	197
Georgia	90.72	2.10	9.69	2.57	6.00	5.88	24.09	5.13	1.10	18.28	3.01	169
Hawaii	60.75	0.00	11.65	3.23	7.21	109.63	19.97	2.85	1.17	20.92	3.30	241
Idaho	53.88	14.61	10.34	2.86	6.40	21.70	28.93	25.73	0.38	18.56	2.92	186
Illinois	86.86	0.88	9.69	2.69	6.00	5.01	31.51	6.16	10.30	15.97	2.89	178
Indiana	57.78	0.84	9.69	2.32	6.00	1.57	31.02	1.65	4.12	18.68	2.90	136
Iowa	62.82	0.16	9.69	2.36	6.00	0.34	34.94	5.12	1.31	18.04	2.96	144
Kansas	56.87	8.21	9.69	2.34	6.00	22.04	29.89	5.87	3.04	16.75	2.81	164
Kentucky	97.37	2.55	9.69	2.76	6.00	1.47	33.02	7.62	2.03	20.24	3.78	187
Louisiana	102.95	3.83	9.69	2.91	6.00	8.97	23.36	4.52	1.92	19.10	3.05	186
Maine	86.19	15.18	10.44	2.89	6.46	14.25	41.03	7.56	2.78	19.90	3.70	210
Maryland	84.79	0.50	9.69	2.60	6.00	9.77	36.83	5.74	1.59	16.46	3.10	177
Massachusetts	98.44	4.92	9.69	2.97	6.00	11.38	47.09	5.82	11.25	18.29	3.04	219
Michigan	86.12	5.10	9.69	2.69	6.00	3.63	27.80	3.66	4.46	17.43	2.74	169
Minnesota	61.20	2.42	9.69	2.29	6.00	6.46	34.31	5.63	0.32	17.05	2.57	148
Mississippi	133.95	3.35	9.69	3.20	6.00	6.74	33.56	3.76	0.65	18.79	3.28	223
Missouri	70.15	0.83	9.69	2.33	6.00	6.49	34.80	1.84	1.25	17.95	3.25	155
Montana	75.75	2.16	14.35	3.97	8.88	144.71	31.39	4.88	2.68	25.76	3.65	318
Nebraska	64.23	1.29	9.69	2.30	6.00	29.48	34.39	4.41	0.50	17.57	3.06	173
Nevada	42.49	3.33	13.04	3.61	8.08	19.53	29.30	2.71	1.64	23.41	3.36	151
New Hampshire	50.23	0.59	12.08	3.34	7.48	14.20	29.21	3.12	2.87	21.69	3.51	148
New Jersey	100.24	1.35	9.69	2.82	6.00	9.10	42.69	5.87	3.00	14.93	3.12	199
New Mexico	101.43	4.00	9.69	2.73	6.00	120.08	33.48	2.54	0.40	18.95	2.84	302
New York	138.23	1.85	9.69	3.37	6.00	3.53	27.77	8.37	7.24	16.50	3.12	226
North Carolina	79.41	2.09	9.69	2.51	6.00	7.59	31.21	5.67	0.99	20.86	3.55	170
North Dakota	67.30	4.59	17.39	4.81	10.77	70.54	30.33	6.48	2.49	31.22	4.35	250
Ohio	66.61	0.64	9.69	2.36	6.00	2.19	30.85	1.78	2.28	17.86	2.85	143
Oklahoma	62.02	1.56	9.69	2.30	6.00	38.86	33.22	4.19	0.64	18.97	2.95	180
Oregon	65.34	15.17	9.69	2.61	6.00	6.36	30.60	2.02	9.70	18.12	2.73	168
Pennsylvania	94.09	1.15	9.69	2.82	6.00	1.49	30.70	7.62	6.90	18.64	3.28	182
Rhode Island	93.46	0.79	14.00	3.87	8.67	16.78	39.10	2.92	3.63	25.13	5.01	213
South Carolina	91.71	0.41	9.69	2.64	6.00	10.84	36.58	6.76	0.61	20.56	3.43	189
South Dakota	88.75	0.43	16.64	4.60	10.30	103.83	33.65	7.02	1.55	29.86	4.28	301
Tennessee	91.44	0.19	9.69	2.64	6.00	3.52	36.38	4.97	0.67	20.29	3.57	179
Texas	75.05	12.97	9.69	2.62	6.00	7.76	29.73	3.60	1.77	16.91	2.42	169
Utah	32.00	1.48	9.69	2.16	6.00	21.43	30.91	3.89	2.10	14.91	1.62	126
Vermont	85.01	7.01	22.73	6.29	14.07	0.06	33.60	2.51	16.21	40.80	4.79	233
Virginia	77.13	0.36	9.69	2.44	6.00	36.38	36.89	8.80	0.83	17.92	3.27	200
Washington	55.97	13.89	9.69	2.39	6.00	32.52	29.46	9.60	2.53	16.92	2.27	181
West Virginia	101.75	0.11	9.69	2.77	6.00	0.17	38.85	4.80	2.11	20.05	4.11	190
Wisconsin	65.40	0.86	9.69	2.31	6.00	6.50	27.95	5.34	2.12	17.91	2.75	147
Wyoming	48.63	2.55	21.87	6.05	13.54	67.23	30.84	2.73	7.40	39.25	4.05	244
50 States + D.C.	84.76	5.77	9.95	2.74	6.16	14.15	31.66	5.22	3.26	17.87	2.94	184
Puerto Rico	169.56	3.13	9.69	3.47	6.00	0.55	13.35	2.19	0.29	16.87	3.15	228
Other Territories	109.02	0.47	41.37	8.34	42.22	30.14	140.49	4.55	5.79	17.23	7.00	407
Total	86.41	5.71	10.00	2.76	6.22	13.92	31.50	5.16	3.20	17.85	2.95	186

Block Grants, Mathematics and Science, Drug-Free Schools, EHA Basic Grants, and Vocational Education. Even under the programs in the latter group, however, some states receive up to three or four times as much aid per pupil or per school-age child as others. Further discussion of these interstate differences is deferred to the next section of this chapter, where multiple statistical indicators of variation among states are presented.

Why are two similar tables, one based on public school enrollment (Table 5) and the other on school-age population (Table 6), used to compare federal aid allocations among states? The main reason is that there is some question as to which is the most appropriate scale factor. A possible objection to comparisons of aid per public school enrollee is that federal aid is not provided for public school pupils only; most major ED elementary-secondary grant programs contain explicit provisions to ensure that some funds will be spent on pupils attending private schools. But comparing aid per person 5-17 is also problematical because significant numbers of pupils drop out of school before turning 18, some 5-year-olds have not yet enrolled, and some persons older than 17 still attend school. Another possibility--using combined public-plus-private K-12 enrollment as the scale factor--is not feasible now because recent data on private school enrollment by state are not available.[6] Flaws notwithstanding, therefore, comparing aid per public school pupil or aid per school-age child are the only practical options.

Although the interstate distributions of aid per public school pupil and aid per school-age child are not identical, they do not differ enough to justify presenting parallel analyses of both throughout this report. The remainder of this assessment of fund distributions focuses, therefore, on only one of the two measures, aid per K-12 pupil enrolled in public school. One reason for favoring this measure over aid per school-age child is that only small fractions of

aid under the elementary-secondary grant programs serve pupils not enrolled in public schools. For example, according to a recent ED report (U.S. Department of Education, Office of Planning, Budget, and Evaluation, 1990), private school pupils account for only 2.9 percent of participants in programs funded with Chapter 1 Grants to LEAs. Another reason is that data on aid per public K-12 enrollee are compatible with other variables to be examined later, such as education expenditures and fiscal effort, which are available only for the public school sector. Henceforth, terms such as "aid per pupil" and "aid per K-12 enrollee" should be taken to mean aid per pupil enrolled in kindergarten through the twelfth grade in public elementary and secondary schools.

Interstate comparisons of federal aid per K-12 enrollee are facilitated by Table 7, which expresses each state's per-pupil allocation of aid under each program as a percentage of U.S.-average aid per pupil under the same program. Each entry in Table 7 is equal to the corresponding entry in Table 5 divided by the U.S. average allocation per pupil (from the bottom line of Table 5) for the program in question. From the figures in Table 7, it is easy to identify states that receive above-average or below-average allocations per pupil from particular programs or from programs in general. For instance, the table shows that the state with the least total aid per pupil, Utah, also receives below-average aid per pupil from every individual program except Impact Aid and receives the smallest relative amount, only 33.8 percent of the U.S. average, in Chapter 1 Grants to LEAs. Other states that receive relatively small per-pupil allotments under most programs include Colorado, Indiana, Iowa, Minnesota, Ohio, Oregon, and Texas. States that receive above-average allocations under most programs include Delaware, Massachusetts, New Jersey, New York, Pennsylvania, Rhode Island, South Dakota, and Vermont (and, of course, Alaska and the District of Columbia). The last column

Table 7

Federal Aid per Pupil as a Percentage of U.S. Average Federal Aid per Pupil
by Program and by State, Fiscal Year 1989

State	Chapter 1 Grants to LEAs	Migrant Education	Chapter 2 Block Grants	Mathematics and Science	Drug-Free Schools	Impact Aid	EHA Basic Grants	EHA Preschool Grants	Chapter 1 Grants for the Handicapped	Vocational Education Basic Grants	Adult Education	Total: 11 Programs
Alabama	121.7	39.0	97.3	100.0	96.9	55.0	132.5	230.4	10.7	112.0	115.0	113.6
Alaska	66.2	1,020.6	190.8	191.2	190.0	4,434.4	107.6	92.2	475.7	191.8	106.6	463.2
Arizona	79.2	182.6	94.3	83.5	93.9	633.9	87.4	72.3	33.7	97.7	77.6	127.5
Arkansas	112.5	144.4	93.4	101.7	93.0	33.1	94.9	138.4	92.7	105.4	122.6	102.6
California	87.9	292.4	92.9	93.3	92.5	90.2	86.8	89.1	9.6	77.6	71.5	92.1
Colorado	66.5	64.7	92.7	80.5	92.3	83.6	80.8	58.9	131.2	89.6	72.0	75.8
Connecticut	94.8	76.2	100.5	97.7	100.1	90.0	121.7	87.5	176.4	88.0	114.8	99.8
Delaware	123.3	108.7	210.2	210.6	209.2	2.5	100.5	16.8	643.0	211.3	170.0	134.0
District of Columbia	220.7	12.5	239.6	240.1	236.5	327.9	32.8	71.1	879.9	240.9	214.1	201.4
Florida	100.0	208.8	94.3	98.9	93.9	47.9	108.8	40.2	64.4	100.1	98.2	98.1
Georgia	105.6	37.0	97.5	93.5	97.1	42.5	76.9	99.9	34.4	103.0	102.8	91.3
Hawaii	73.2	0.0	121.3	121.5	120.8	819.9	66.0	57.4	38.0	122.0	116.5	134.9
Idaho	57.1	234.3	94.7	94.9	94.2	142.7	84.1	456.1	10.9	95.2	90.7	91.8
Illinois	107.7	16.5	103.9	104.3	103.5	38.6	107.2	127.9	344.4	95.9	105.2	102.7
Indiana	65.9	14.6	96.4	83.4	96.0	11.2	97.9	31.8	128.0	104.0	97.9	72.9
Iowa	72.1	2.9	96.2	84.7	95.7	2.4	110.0	98.3	40.4	109.3	99.7	76.8
Kansas	62.5	136.7	92.1	80.6	91.7	150.4	90.2	108.1	90.2	89.1	90.7	83.7
Kentucky	115.4	45.7	99.3	102.2	98.9	10.8	107.4	151.2	64.7	116.1	131.2	102.9
Louisiana	124.6	70.3	101.4	110.2	101.0	67.4	77.6	91.6	62.6	111.9	108.3	105.0
Maine	91.2	243.2	95.4	95.6	95.0	93.6	119.1	133.8	79.3	101.9	114.8	103.6
Maryland	99.8	9.0	98.6	95.6	98.2	71.4	119.0	113.1	50.4	93.8	107.1	97.0
Massachusetts	115.9	87.7	98.7	109.6	98.2	83.2	152.1	114.8	357.2	104.3	104.9	120.0
Michigan	100.0	89.6	97.3	97.8	96.9	26.2	88.6	71.1	139.7	98.0	93.1	91.5
Minnesota	67.9	40.6	93.0	79.5	92.6	44.5	104.5	104.5	9.5	91.6	83.7	76.4
Mississippi	158.1	59.8	98.9	118.3	98.4	49.4	108.7	74.3	20.8	107.3	113.5	122.5
Missouri	83.7	15.0	100.0	87.1	99.5	48.1	113.9	36.8	40.3	103.7	113.7	85.9
Montana	81.5	35.2	133.5	133.8	132.9	967.3	92.7	88.0	77.7	134.2	115.2	159.4
Nebraska	73.7	22.5	96.2	82.5	95.7	210.1	108.3	84.8	15.4	97.6	103.0	92.4
Nevada	43.4	51.5	115.1	115.4	114.6	123.9	82.1	46.4	45.2	115.8	100.7	71.5
New Hampshire	57.7	10.2	119.9	120.2	119.4	101.2	92.0	60.0	89.0	120.6	118.1	79.3
New Jersey	125.2	25.4	104.6	110.0	104.2	70.6	146.2	122.7	100.9	90.2	114.4	115.5
New Mexico	110.8	66.2	91.5	93.4	91.1	814.6	100.4	46.4	11.9	100.2	91.0	153.6
New York	171.2	34.8	103.8	130.8	103.3	27.2	94.4	173.4	241.7	98.9	113.4	130.1
North Carolina	89.3	35.6	94.2	88.3	93.8	53.0	96.2	106.6	30.1	113.5	117.0	88.7
North Dakota	76.6	79.0	171.0	171.3	170.2	498.3	94.7	123.3	76.4	171.9	145.2	132.5
Ohio	79.1	11.6	99.5	87.5	99.1	16.2	100.5	35.3	73.0	102.7	99.1	79.1
Oklahoma	69.5	26.5	93.9	80.6	93.4	270.3	102.1	78.5	19.4	102.9	96.8	94.1
Oregon	71.9	252.6	92.2	89.9	91.7	43.5	92.4	37.3	287.7	96.5	88.0	86.2
Pennsylvania	120.0	22.2	106.9	112.7	106.4	11.8	107.5	162.7	237.4	115.1	122.7	108.3
Rhode Island	117.5	15.0	152.1	152.4	151.4	131.0	134.8	61.4	123.2	152.9	184.6	124.8
South Carolina	104.5	7.0	95.4	94.2	95.0	76.7	114.3	128.8	18.8	113.3	114.6	100.3
South Dakota	98.8	7.3	160.1	160.4	159.4	717.9	102.8	130.9	46.5	161.0	139.6	155.9
Tennessee	105.2	3.3	96.4	95.1	96.0	25.1	114.8	95.7	20.9	113.0	120.3	96.0
Texas	81.5	213.2	91.0	89.0	90.6	52.3	88.6	65.4	51.9	88.9	77.1	85.2
Utah	33.8	23.7	88.6	71.5	88.2	140.6	89.6	68.8	59.9	76.3	50.3	62.1
Vermont	94.1	117.5	217.4	217.8	216.4	0.4	102.0	46.4	483.8	218.6	155.5	120.0
Virginia	83.4	5.9	90.7	82.5	90.2	244.4	109.5	159.3	24.1	93.9	103.7	100.6
Washington	59.9	225.1	89.7	80.2	89.3	216.2	86.5	172.0	73.0	87.7	71.4	90.3
West Virginia	115.7	1.9	95.3	98.6	94.8	1.2	121.2	91.3	64.8	110.4	136.9	100.8
Wisconsin	78.9	15.7	101.1	87.1	100.6	48.7	92.5	107.8	68.9	104.6	97.4	82.4
Wyoming	53.5	42.5	207.8	208.2	206.8	459.0	93.0	50.3	219.4	208.9	130.6	124.9
50 States + D.C.	97.8	100.7	99.2	98.9	98.8	101.4	100.2	100.8	101.3	99.8	99.3	99.1
Puerto Rico	231.0	64.6	114.1	147.9	113.6	4.6	49.9	49.9	10.8	111.2	125.9	144.7
Other Territories	129.1	8.5	423.5	309.2	695.0	221.7	456.5	90.2	184.8	98.8	242.9	224.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

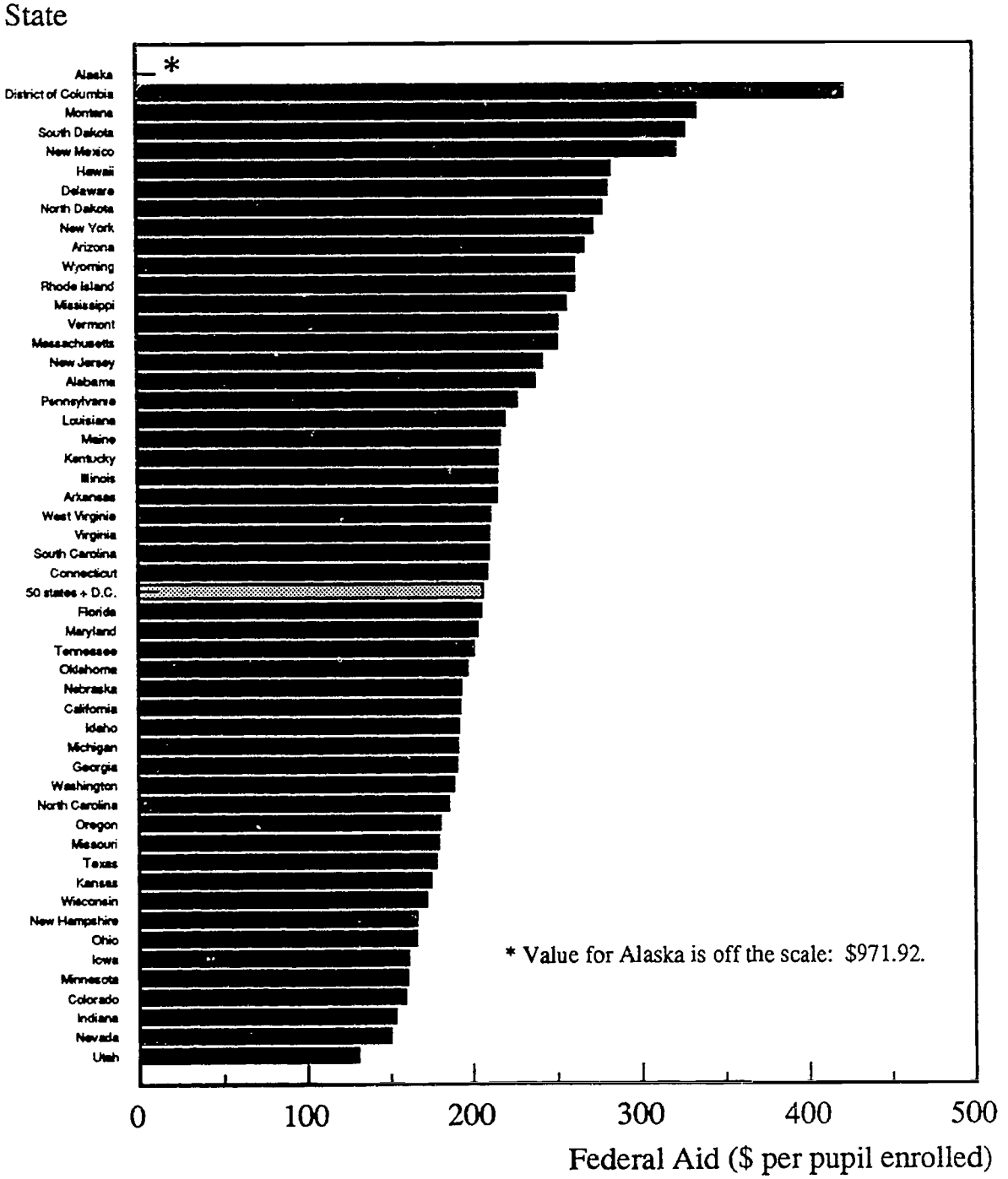
of the table shows that state allocations per pupil range from 62 percent of the U.S. average (Utah) to 159 percent of that average (Montana), again excluding Alaska and the District of Columbia.

One other point to keep in mind in interpreting Tables 5 and 7 and all subsequent analyses of per-pupil allocations of aid is that expressing federal aid amounts as dollars per K-12 enrollee is not intended to imply that federal funds are provided for, or expended on behalf of, all K-12 pupils. Clearly, many ED grant programs, including the largest ones, are aimed at particular categories of pupils ("target groups") and not at the pupil population as a whole. The purpose of translating aid allocations into dollars per K-12 pupil is, once again, to adjust for the gross differences in scale among states. Analyses of federal aid allocations per target-group member (under selected programs only) are presented later.

INTERSTATE VARIATIONS IN AID PER PUPIL

Per-pupil allocations under all the major grant programs vary substantially among states, but the degree of variation is much greater under some programs than others. The pattern of variation in total aid under the 11 major programs combined can be discerned from the last column of Table 7 but is conveyed more clearly by the bar chart in Figure 1, which ranks the states according to aggregate allocations per pupil. This chart reveals surprisingly heterogeneous groups of states at both the top and bottom ends of the distribution. The high-aid group is a mix of sparsely populated states of the West (e.g., Montana, New Mexico, and South Dakota) and industrial states of the Northeast (e.g., New York, Delaware, and Rhode Island). The fewest dollars of aid per K-12 enrollee go to other western states such as Colorado, Nevada, and Utah and to midwestern states such as Indiana, Iowa, Ohio, and

Figure 1
States Ranked by Federal Aid per Pupil



Wisconsin. The southeastern states generally are clustered in the middle of the distribution. (Regional patterns in the distribution of federal funds are discussed in greater detail below.)

Table 8 presents statistical indicators of interstate variations in aid per K-12 enrollee under each program. Many of these indicators are standard or self-explanatory, but brief explanations of some may be helpful:

- The table provides both U.S.-average aid per pupil and the mean of the state allocations per pupil under each program. The two differ because the latter weighs all states equally, whereas the former gives each state a weight proportional to its K-12 enrollment. The U.S. average values are larger than the mean state allocations for programs that tend to provide above-average aid per pupil to larger states, whereas the mean state allocations are larger for programs that tend to provide above-average grants per pupil to smaller states.

- The table presents two sets of percentile figures--percentiles of states and percentiles of pupils. In computing the "percentiles of states" figures, all states are treated as single units (i.e., weighted equally). For example, the entry of 68.87 for the 25th percentile of states in the Chapter 1 Basic Grants column of the table signifies that 25 percent of the states receive grants of $68.87 per K-12 enrollee or less under that program. In computing the "percentiles of pupils" figures, pupils are the units, and each state's aid allocation is, in effect, weighted by the state's number of pupils. For example, the entry of 75.71 for the 25th percentile of pupils in the first column of the table indicates that 25 percent of all K-12 pupils are in states that receive $75.71 or less under the Chapter 1 Basic Grants program.

- Both unweighted and pupil-weighted standard deviations and coefficients of variation are presented (the coefficient of variation is the standard deviation expressed as a percentage of the mean). Again, the unweighted figures are computed by treating each state as a single unit regardless of its size, whereas the pupil-weighted figures are obtained by assigning each state a weight proportional to its K-12 enrollment. The generally smaller values of the latter indicate that the states whose per-pupil aid allocations deviate the most from the U.S. mean tend to be relatively small states--that is, aid is more equally distributed among pupils than among states.

Table 8 confirms that variations in aid per K-12 enrollee among states are much greater under some programs than others. Six of the 11 programs fall into what might be

Table 8

Statistical Indicators of Interstate Variation in Federal Elementary-Secondary Education Aid per Pupil, by Program, FY 1989
(All values except ratios in dollars per pupil enrolled)

Statistical Indicator	Chapter 1 Basic Grants to LEAs	Chapter 1 Concentration Grants	Subtotal: Chapter 1 Grants to LEAs	Migrant Education	Chapter 2 Block Grants	Mathematics and Science	Drug-Free Schools
Averages and range							
U.S. average	91.42	4.09	95.51	6.50	11.21	3.09	6.94
Mean of state allocations	87.51	3.83	91.34	5.82	12.85	3.49	7.95
Maximum	203.08	12.46	215.54	65.83	27.08	7.49	16.76
Minimum	32.03	0.94	33.03	0.00	10.01	2.23	6.19
Range	171.05	11.52	182.51	65.83	17.07	5.26	10.57
Ratio: Maximum/minimum	6.3	13.3	6.5	--	2.7	3.4	2.7
Percentiles of states							
5th	48.74	1.02	52.21	0.18	10.24	2.50	6.34
25th	68.87	2.01	70.19	0.97	10.64	2.72	6.59
50th (median state)	83.61	3.51	87.17	2.51	11.02	3.05	6.82
75th	103.91	4.96	109.86	7.01	12.08	3.69	7.48
95th	145.80	7.80	154.36	16.29	23.75	6.57	14.70
Ratio: 75th/25th percentile	1.5	2.5	1.6	7.2	1.1	1.4	1.1
Ratio: 95th/5th percentile	3.0	7.6	3.0	90.5	2.3	2.6	2.3
Percentiles of pupils							
5th	59.83	1.14	61.06	0.38	10.24	2.51	6.34
25th	75.71	3.24	79.58	1.07	10.50	2.73	6.50
50th (median pupil)	83.61	3.88	87.17	2.51	10.90	2.92	6.74
75th	101.98	4.96	108.22	13.47	11.42	3.25	7.07
95th	159.39	7.80	167.19	18.86	12.08	4.08	7.48
Ratio: 75th/25th percentile	1.3	1.5	1.4	12.6	1.1	1.2	1.1
Ratio: 95th/5th percentile	2.7	6.8	2.7	49.6	1.2	1.6	1.2
Standard deviation							
Unweighted	29.9	2.2	31.9	10.0	4.2	1.2	2.6
Pupil-weighted	26.1	1.8	27.6	7.2	1.7	0.6	1.1
Coefficient of variation							
Unweighted	34.2	56.6	34.9	171.0	33.0	35.6	33.0
Pupil-weighted	28.5	44.0	28.9	110.8	15.2	19.5	15.2

(continued)

Table 8 (continued)

Statistical Indicators of Interstate Variation in Federal Elementary-Secondary Education Aid per Pupil, by Program, FY 1989
(All values except ratios in dollars per pupil enrolled)

Statistical Indicator	Impact Aid	EHA Basic Grants	EHA Preschool Grants	Chapter 1 Grants for the Handicapped	Vocational Education Basic Grants	Adult Education	Total: 11 Programs
Averages and range							
U.S. average	15.93	35.68	5.88	3.67	20.13	3.31	207.84
Mean of state allocations	39.54	35.85	5.85	4.68	23.50	3.69	234.56
Maximum	697.41	54.16	26.61	31.87	48.60	7.13	971.92
Minimum	0.07	11.69	0.98	0.35	15.39	1.68	130.26
Range	697.34	42.47	25.63	31.52	33.21	5.46	841.66
Ratio: Maximum/minimum	9,963.0	4.6	27.2	91.1	3.2	4.2	7.5
Percentiles of states							
5th	0.38	27.37	2.06	0.39	17.69	2.38	152.93
25th	6.07	31.90	3.50	1.22	19.35	3.23	180.85
50th (median state)	11.23	35.77	5.33	2.35	20.92	3.57	210.50
75th	33.04	38.98	7.20	4.75	23.35	3.94	256.96
95th	128.94	48.00	10.12	12.47	42.63	5.66	334.50
Ratio: 75th/25th percentile	5.4	1.2	2.1	3.9	1.2	1.2	1.4
Ratio: 95th/5th percentile	339.3	1.8	4.9	32.0	2.4	2.4	2.2
Percentiles of pupils							
5th	1.76	27.61	2.06	0.35	15.65	2.38	159.15
25th	4.27	31.53	3.82	0.87	18.08	2.59	180.16
50th (median pupil)	8.23	34.26	5.33	2.33	19.96	3.32	193.23
75th	14.19	38.68	7.46	4.75	21.04	3.79	220.25
95th	42.51	48.00	10.12	12.47	23.35	4.09	272.96
Ratio: 75th/25th percentile	3.3	1.2	2.0	5.5	1.2	1.5	1.2
Ratio: 95th/5th percentile	24.2	1.7	4.9	35.6	1.5	1.7	1.7
Standard deviation							
Unweighted	101.0	7.0	3.9	6.3	7.6	1.0	118.8
Pupil-weighted	41.2	5.9	3.0	4.0	3.6	0.7	53.9
Coefficient of variation							
Unweighted	255.4	19.4	66.6	133.9	32.2	25.7	50.6
Pupil-weighted	258.8	16.6	51.4	109.0	18.0	20.2	25.9

called a "moderate variation" category. Each of these--Chapter 2 Block Grants, Mathematics and Science, Drug-Free Schools, EHA Basic Grants, Vocational Education, and Adult Education--has a pupil-weighted coefficient of variation of .20 or less and a 95th-to-5th percentile ratio no greater than 1.7.[7] Three programs, Impact Aid, Migrant Education, and Chapter 1 Grants for the Handicapped, can be labeled "high variation." Their pupil-weighted coefficients of variation are greater than 1.0 (2.6 for Impact Aid), and their 95th-to-5th percentile ratios range from 24 to 50--in other words, the state enrolling the 95th-percentile pupil receives 24 to 50 times as much aid per pupil as the state enrolling the 5th-percentile pupil. The remaining programs, making up a "medium variation" category, are Chapter 1 Grants to LEAs (both its Basic Grants and Concentration Grants components, which are treated separately in this table) and EHA Preschool Grants.[8]

There is no mystery about why the programs differ so markedly in this respect. The programs in the moderate-variation group distribute aid according to broad population factors or, in the case of the EHA Basic Grant program, according to a count of pupils served that does not vary greatly as a percentage of each state's K-12 enrollment. That allocations vary as much as they do under these programs is primarily due to the presence of constraints (especially lower bounds on each state's share of funds) and, in the Vocational Education case, to the effects of adjusting for differences in state per capita income. The high-variation programs, in contrast, distribute funds according to need factors that display extreme variation among states--the number of "federally related" pupils in the case of Impact Aid, a variable that depends on the locations of Indian reservations, military bases, and other federal installations; the number of migrant children in the case of the Migrant Education program, a factor associated with the presence of certain types of agriculture; and the number of handi-

capped children served in state institutions in the case of the Chapter 1 Handicapped program, a factor that depends on state policies affecting where handicapped children are placed. The medium-variation ratings of the Chapter 1 Basic Grants and Concentration Grants programs reflect a complex interplay between the two main factors on which the allocations are based--the number of low-income children in each state and the level of state education outlay per pupil. This interaction is examined in detail, as are the workings of other grant formulas, in the later discussion of fund distributions under the individual programs.

REGIONAL VARIATIONS IN AID PER PUPIL

Regional differences in grant amounts have already been mentioned, but the subject merits a more detailed discussion. Figure 2 provides a general impression of the geographical distribution of aid under the 11 major grant programs combined. Regional data on allocations per pupil, both for the individual programs and for all programs combined, are presented in Table 9.

The map diagram shows that geographical variations in federal funding are complex. No major area of the country contains exclusively above-average or below-average states. The western region includes some states with the highest and some with the lowest aid allocations per pupil. New England includes a number of states with above-average allocations but also the low-aid state of New Hampshire. If any general pattern is discernible, it is that per-pupil allocations in the Northeast are generally average or above average, whereas per-pupil allocations in the Midwest are generally average or below. To say more, one must look at how funds are apportioned under the individual programs.

Table 9 shows that the distributions of federal funds by region differ sharply from one program to another. The table uses the eight geographical groupings of states

Figure 2

Interstate Variation in Federal Aid per Pupil

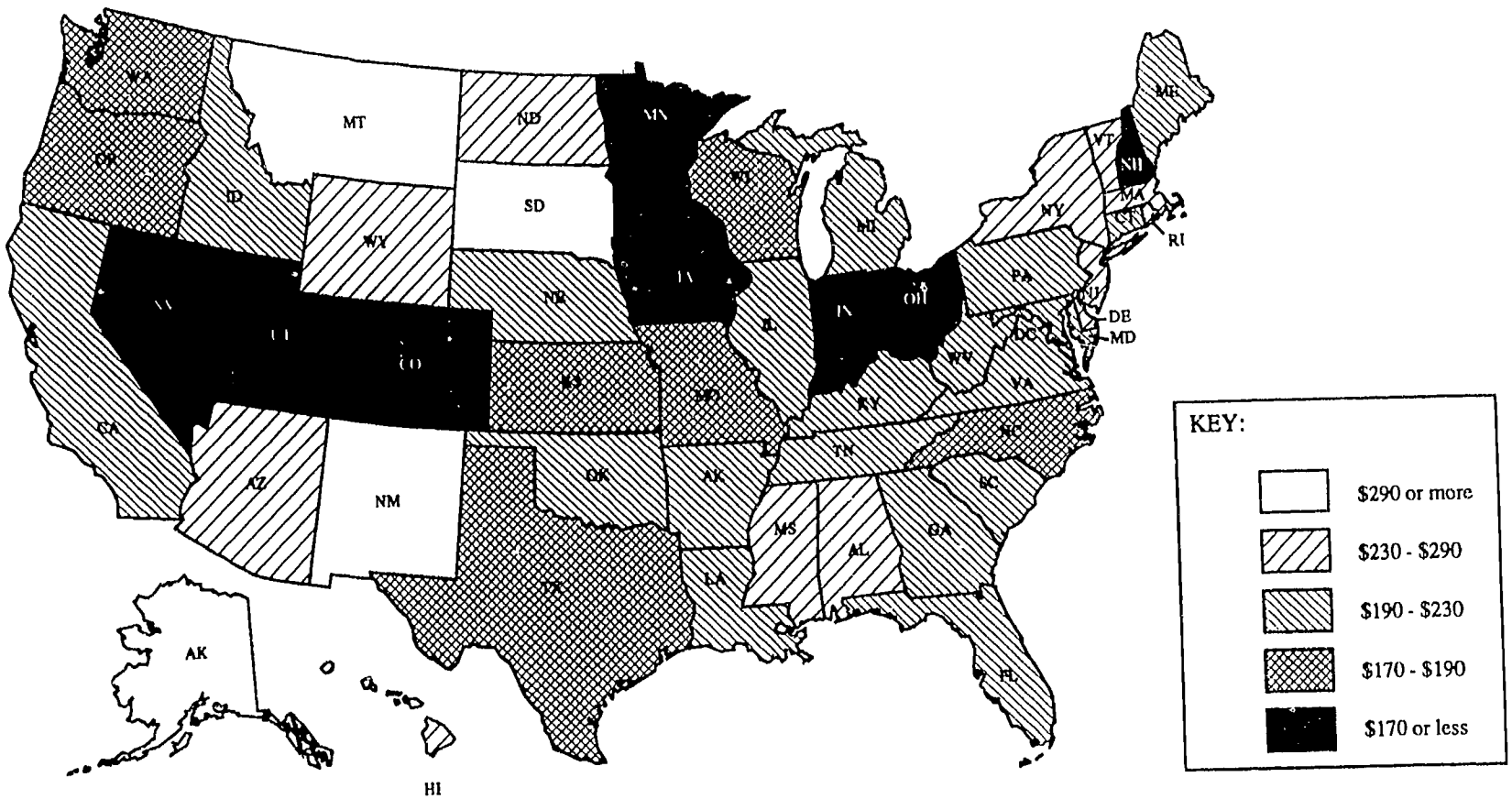


Table 9

Federal Aid Allocations by Region
(Bureau of Economic Analysis Divisions), FY 1989

BEA Division	Chapter 1 Grants to LEAs	Migrant Education	Chapter 2 Block Grants	Mathematics and Science	Drug-Free Schools	Impact Aid	EHA Basic Grants	EHA Preschool Grants	Chapter 1 Grants for the Handicapped	Vocational Education Basic Grants	Adult Education	Total: 11 Programs
New England	99.42	5.92	12.46	3.57	7.71	13.67	46.97	5.73	8.97	22.30	3.92	230.65
	104	91	111	116	111	86	132	97	244	111	118	111
Mideast	138.09	1.79	12.17	3.78	7.53	6.18	38.77	8.82	7.59	21.16	3.92	249.81
	145	28	109	122	109	39	109	150	207	105	118	120
Great Lakes	87.40	2.04	11.29	2.92	6.99	4.29	34.98	4.39	6.02	20.22	3.30	183.84
	92	31	101	94	101	27	98	75	164	100	100	88
Plains	72.60	2.57	11.48	2.81	7.11	18.28	37.65	5.00	1.43	20.72	3.40	183.05
	76	40	102	91	102	115	106	85	39	103	103	88
Southeast	104.69	4.35	10.83	3.03	6.71	10.22	36.90	6.42	1.50	21.60	3.72	209.97
	110	67	97	98	97	64	103	109	41	107	112	101
Southwest	79.64	11.45	10.37	2.73	6.42	30.96	32.33	3.89	1.57	18.63	2.68	206.66
	83	176	93	88	93	194	91	66	43	93	81	97
Rocky Mountain	54.81	4.71	11.72	2.94	7.26	35.67	30.61	7.17	3.36	20.01	2.59	180.80
	57	72	105	95	105	224	86	122	92	99	78	87
Far West	79.30	17.99	10.79	2.95	6.68	30.83	30.90	5.47	1.72	17.03	2.51	206.15
	83	277	96	95	96	193	87	93	47	85	76	99
Total U.S.	95.51	6.50	11.21	3.09	6.94	15.94	35.68	5.88	3.67	20.14	3.31	207.86
	100	100	100	100	100	100	100	100	100	100	100	100

Notes: 1. The top entry in each cell is the per-pupil allocation in dollars. The bottom entry is the per-pupil allocation for the region as a percentage of the per-pupil allocation for the U.S.

2. Totals are for the 50 states and the District of Columbia. Territories are not included. Allocations for Alaska and Hawaii are included in the U.S. totals but not in the regional figures.

3. Bureau of Economic Analysis (BEA) divisions include the following states:
New England--Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont
Mideast--Delaware, District of Columbia, Maryland, New Jersey, New York, Pennsylvania
Great Lakes--Illinois, Indiana, Michigan, Ohio, Wisconsin
Plains--Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota
Southeast--Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, West Virginia
Southwest--Arizona, New Mexico, Oklahoma, Texas
Rocky Mountain--Colorado, Idaho, Montana, Utah, Wyoming
Far West--California, Nevada, Oregon, Washington

("divisions") recognized by the Bureau of Economic Analysis (BEA) in the Commerce Department. For each division and each program it presents two pieces of information: (1) the dollar amount of aid per pupil and (2) the per-pupil allocation to the region expressed as a percentage of the per-pupil allocation in the nation. A value of the latter below 100 indicates that the region receives less than the national-average amount of aid per K-12 enrollee under the program in question; a value greater than 100 indicates that it receives an above-average allocation.

Regional variations are minor under some programs. Grants under the Chapter 2 Block Grant program, for example, vary only from 96 to 111 percent of the U.S. average among the eight geographical areas. Other programs exhibit far stronger regional patterns. Per-pupil allocations of Chapter 1 Grants to LEAs are 45 percent above the U.S. average in the Mideast division but 43 percent below the U.S. average in the Rocky Mountain states. Migrant Education grants per K-12 enrollee are three times as great in the Far West and twice as great in the Southwest as in any other division. Impact Aid flows at double the national rate to states of the Southwest, Rocky Mountain, and Far West divisions. Both the EHA Basic Grants program and the Chapter 1 Handicapped program provide more aid per pupil to New England than to other parts of the country. The regional differences in the "total" column of the table (11 programs combined) are relatively moderate (from about 12 percent below the U.S. average allotment of aid per pupil to about 20 percent above), but this moderation is due in large part to the offsetting effects of differing regional patterns under the individual programs.

Table 9 shows that Chapter 1 Grants to LEAs, which account for 46 percent of all funds distributed under the 11 programs, play a major role in determining the overall

distribution of aid among regions. It also shows that above-average allocations under other programs sometimes compensate for below-average allocations under Chapter 1. That the Mideast division receives more federal funds per K-12 enrollee than the nation as a whole is due entirely to its high Chapter 1 allocations. Conversely, that the Plains states and Rocky Mountain states receive relatively low total allotments is due mainly to their below-average per-pupil allocations of Chapter 1 funds. The Rocky Mountain states would fare considerably worse, however, if their below-average Chapter 1 grants were not partly offset by large grants under the Impact Aid program. Similarly, the Far Western and Southwestern divisions would fall substantially below, rather than only slightly below, average in aggregate aid per pupil if their low levels of Chapter 1 funding were not compensated for, in part, by large allocations of Impact Aid and Migrant Education funds.

RELATIONSHIPS BETWEEN AID ALLOCATIONS AND STATE CHARACTERISTICS

An important consideration in assessing the existing distributions of federal funds is how allocations relate to pertinent characteristics of states. Among the specific questions of interest are how aid amounts vary with levels of state-local education funding, how they correlate with state fiscal capacity and fiscal effort to support education, and how they are associated with such demographic factors as the prevalence of poverty and the percentage of minority group members in a state's population. This section summarizes the relationships between each attribute and per-pupil allocations under the different grant programs.

The Relationship of Aid to State-Local Support for Education

Two frequently asked questions about federal education aid are how large a share it makes up of each state's total support for elementary-secondary education and how it relates

to the education revenues that states provide from their own (nonfederal) sources. Table 10 provides a partial answer to the former question by showing each state's aid allocation (the 11-program total) as a percentage of the state's total elementary-secondary education revenue per pupil. For the U.S. as a whole, the major ED grant programs contribute 4.7 percent of total education revenue, but this varies from lows of just over 3 percent in Connecticut, Minnesota, and New Jersey to highs of 9.3, 10.7, and 12.4 percent, respectively, in South Dakota, Mississippi, and Alaska. (Note that these percentages do not represent the total federal financial contribution to elementary-secondary education but only the portion accounted for by the 11 major programs examined in this report.)

Whether federal aid is positively or negatively related to state-local support for education is important in assessing the distributional effect of federal funding on the nation's school finance system. Two statistical indicators of association, one the familiar correlation coefficient, the other an elasticity measure (explained below), are used here to quantify these relationships. The correlation coefficient between federal aid per pupil and total elementary-secondary revenue per pupil (federal plus state plus local) is .47, and the correlation between federal aid per pupil and state-local (nonfederal) revenue per pupil is .36, signifying that aid is positively but not strongly correlated with both fiscal variables.[9] The elasticity of federal aid per pupil with respect to state expenditure per pupil (defined as the percentage increase in aid associated with a 1 percent increase in expenditure) is .36, meaning that federal aid rises with expenditure but at a less than proportional rate (i.e., a state that spends 10 percent more per pupil than another tends to receive, on average, about 3.6 percent more federal aid per pupil).[10] Similarly, the elasticity of aid with respect to state-local revenue is .24, indicating that aid increases with, but less than in proportion to, education funding from nonfederal

Table 10

Federal Aid in Relation to State and Local Support of Education, Fiscal Year 1989

State	Federal Aid (11 Major Programs) ($ per pupil)	Total Education Revenue ($ per pupil)	Federal Aid as a Percentage of Total Revenue
Alabama	238.36	3,254	7.33
Alaska	971.92	7,855	12.37
Arizona	267.55	3,876	6.90
Arkansas	215.20	2,809	7.66
California	193.23	4,376	4.42
Colorado	159.15	4,797	3.32
Connecticut	209.46	6,688	3.13
Delaware	281.14	4,946	5.68
District of Columbia	422.70	6,038	7.00
Florida	205.91	4,661	4.42
Georgia	191.54	4,081	4.69
Hawaii	283.08	3,795	7.46
Idaho	192.73	2,902	6.64
Illinois	215.55	3,621	5.95
Indiana	152.93	4,385	3.49
Iowa	161.13	4,337	3.72
Kansas	175.57	4,164	4.22
Kentucky	215.87	2,938	7.35
Louisiana	220.25	3,405	6.47
Maine	217.38	4,513	4.82
Maryland	203.58	5,136	3.96
Massachusetts	251.74	5,439	4.63
Michigan	192.03	4,821	3.98
Minnesota	160.37	4,785	3.35
Mississippi	256.96	2,405	10.68
Missouri	180.16	3,938	4.57
Montana	334.50	4,593	7.28
Nebraska	193.82	4,194	4.62
Nevada	150.12	3,945	3.81
New Hampshire	166.36	4,327	3.85
New Jersey	242.42	7,327	3.31
New Mexico	322.37	3,825	8.43
New York	272.96	6,944	3.93
North Carolina	186.14	3,603	5.17
North Dakota	278.06	3,675	7.57
Ohio	165.98	3,936	4.22
Oklahoma	197.36	3,118	6.33
Oregon	180.85	4,236	4.27
Pennsylvania	227.26	5,634	4.03
Rhode Island	261.93	5,750	4.56
South Carolina	210.50	3,682	5.72
South Dakota	327.20	3,483	9.39
Tennessee	201.50	3,201	6.29
Texas	178.70	3,804	4.70
Utah	130.26	2,357	5.53
Vermont	251.88	4,774	5.28
Virginia	211.00	4,258	4.96
Washington	189.51	4,106	4.62
West Virginia	211.44	3,286	6.44
Wisconsin	173.00	4,852	3.57
Wyoming	262.13	4,872	5.38
50 States + D.C.	207.86	4,441	4.68

Sources: Federal aid from Table 6; total education revenue from NCES (1990).

sources. These statistics show that, on average, higher spending states draw more aid dollars per pupil but smaller percentages of their revenue from the federal grant programs. It can be said, therefore, that federal aid tends to increase absolute differences but to reduce relative differences in per pupil spending among states.[11]

Table 11 presents the same kinds of correlation coefficients and elasticity statistics for the individual grant programs. What it shows, most notably, is that per-pupil allocations under all but a few programs are related only weakly, if at all, to levels of per-pupil spending or revenue. Most of the elasticities are positive--that is, states with more funds of their own generally tend to get more federal aid--but few are statistically significant. The strongest relationship, however, is the one that counts the most: allocations of Chapter 1 Grants to LEAs are clearly and positively related to levels of state-local funding. This relationship reflects the influence of the per-pupil expenditure factor in the Chapter 1 formula. The two other significant positive relationships (indicated by asterisks in the table) are also in programs that link aid to per-pupil expenditure--Chapter 1 Grants for the Handicapped and Mathematics and Science.[12] Note that the only program under which aid seems to be negatively related to state-local support for education (though not significantly so) is Vocational Education--the obvious reason being that funds under that program are distributed in a negative relationship to state per capita income.

The Relationship of Aid to State Fiscal Capacity

The relationship of aid to state fiscal capacity is one of the first things analysts look at to assess the equity of any interstate distribution of intergovernmental grants. Although not everyone agrees that aid should be explicitly equalizing--that is, tilted deliberately in favor of states with limited ability to pay--few would argue that giving more aid per pupil to high-

Table 11

Relationship of Federal Aid, by Program, to Level of State-Local Education Spending and Revenue

Program	Relationship of Aid per Pupil to State-Local Expenditure per Pupil		Relationship of Aid per Pupil to State-Local Revenue per Pupil	
	Correlation Coefficient	Elasticity	Correlation Coefficient	Elasticity
Chapter 1 Grants to LEAs	0.48	0.468 *	0.46	0.369 *
Migrant Education	0.04	0.376	-0.06	0.007
Chapter 2 Block Grants	0.27	0.142 *	0.23	0.118
Mathematics and Science	0.46	0.312 *	0.42	0.255 *
Drug-Free Schools	0.27	0.142	0.23	0.118
Impact Aid	0.17	0.032	0.06	-0.274
EHA Basic Grants	0.18	0.081	0.24	0.110
EHA Preschool Grants	0.21	0.472	0.20	0.335
Chapter 1 Grants for the Handicapped	0.49	2.150 *	0.46	2.060 *
Vocational Education	-0.01	-0.057	-0.01	-0.047
Adult Education	0.15	0.093	0.17	0.096
Total: 11 Programs	0.47	0.358	0.36	0.245 *

Note: Data on expenditure per pupil and state and local revenue per pupil are for school year 1987-88.

* = elasticity significantly different from zero at the 0.05 level.

capacity than to low-capacity states (other things being equal) is the preferred policy. Statistical relationships between education aid per pupil and measures of fiscal capacity are therefore of considerable policy interest.

As was explained in Chapter 2, state fiscal capacity may be measured in multiple ways. The most commonly used measure, state per capita income, is readily available and familiar; it is also, of course, the indicator used in the one elementary-secondary aid formula, Vocational Education, that features a fiscal capacity factor. Nevertheless, per capita income is a seriously flawed capacity indicator; consequently, comparing aid against per capita income alone would not constitute an adequate analysis of the aid-capacity relationship.[13] The following discussion considers not only income but also gross state product (GSP) and the Representative Tax System (RTS) and Representative Revenue System (RRS) indices, both developed by the Advisory Commission on Intergovernmental Relations (ACIR). In addition, there is a strong argument for defining fiscal capacity in the education context in per-pupil rather than per capita terms. Because all four of the measures just cited can be expressed either as capacity per pupil or capacity per capita, there are eight different capacity indicators against which aid allocations can be compared.

Table 12 displays statistics of association between aid per K-12 enrollee under the 11 major grant programs combined and the various capacity measures. The correlations between aid allocations and all eight measures are positive, as are the elasticities of aid with respect to fiscal capacity, but only the elasticities marked with asterisks are statistically significant (i.e., significantly different from zero) at the .05 level of probability. By the criterion of statistical significance, the indicators of capacity per pupil show a more clear-cut positive relationship to aid than do the indicators of capacity per capita.

Table 12

Relationships Between Federal Aid Allocations and State Fiscal Capacity: Eleven Major Formula Grants Combined

Fiscal Capacity Indicator	Relationship of Federal Aid per K-12 Enrollee to Capacity Indicator	
	Correlation Coefficient	Elasticity
Per capita measures		
Income per capita	0.19	0.235
Gross state product (GSP) per capita	0.42	0.337
RTS index (per capita)	0.25	0.185
RRS index (per capita)	0.48	0.308 *
Per-pupil measures		
Income per pupil	0.21	0.204 *
Gross state product (GSP) per pupil	0.39	0.326 *
RTS index (per pupil)	0.24	0.227
RRS index (per pupil)	0.41	0.284 *

Notes:
1. RTS and RRS refer to the Representative Tax System Index and the Representative Revenue System Index, both developed by the Advisory Commission on Intergovernmental Relations.
2. Income is 1988 personal income; GSP, RTS, and RRS data are for 1986 (the most recent available).
3. * = elasticity significantly different from zero at the 0.05 level.

Table 13 shows the relationships under the individual grant programs between aid per pupil and four selected capacity indicators: income per capita, income per pupil, and both the per capita and per-pupil versions of the RTS index. In most instances, the level of federal aid per pupil is associated only weakly, if at all, with any fiscal capacity indicator. Positive relationships between aid and capacity do emerge, however, in programs in the Chapter 1 family--those that incorporate the per-pupil expenditure factor in their formulas. A negative relationship is evident in Vocational Education, which links aid inversely to per capita income. In these respects, the relationships between aid and fiscal capacity are quite similar to the relationships between aid and state-local education revenue discussed earlier--a similarity that is not surprising, considering that a state's fiscal capacity is one of the major determinants of how much the state spends on its schools.

Note that the relationships of aid to the income-based fiscal capacity measures are quite different, in some cases, from the relationships to the indicators based on the RTS index. The main reason appears to be that some of the small states that receive particularly high aid allocations under certain education grant programs (Alaska, Montana, etc.) also have sharply higher fiscal capacity ratings according to the RTS index than according to an index of per capita income. Such differences in state fiscal capacity scores should be considered in connection with any proposal to incorporate additional or alternative fiscal capacity factors into the education aid formulas, because the effects of adjusting for capacity would differ depending on the indicator selected. Differences in state ratings according to different capacity measures are examined in more detail as part of the discussion of alternative formulas in Chapter 4.

Table 13

Relationships of Federal Aid, by Program, to Measures of State Fiscal Capacity

Program	Measure of State Fiscal Capacity			
	Income per Capita	RTS Index per Capita	Income per Pupil	RTS Index per Pupil
Chapter 1 Grants to LEAs	0.25 0.398	-0.04 -0.082	0.38 0.406 *	0.2 0.264
Migrant Education	0.16 1.28	0.5 4.07 *	0.05 0.337	0.33 1.94 *
Chapter 2 Block Grants	0.09 0.077	0.17 0.085	0.13 0.072	0.17 0.091
Mathematics and Science	0.23 0.242	0.22 0.188	0.3 0.207 *	0.3 0.23 *
Drug-Free Schools	0.09 0.077	0.17 0.085	0.13 0.072	0.17 0.091
Impact Aid	-0.01 0.708	0.27 2.59 *	-0.08 -0.004	0.08 0.975
EHA Basic Grants	0.23 0.152	-0.02 -0.106	0.34 0.161	0.17 0.066
EHA Preschool Grants	0.1 0.484	-0.16 -0.331	0.13 0.311	-0.07 -0.051
Chapter 1 Grants for the Handicapped	0.36 1.56	0.17 0.255	0.41 1.26 *	0.29 0.785
Vocational Education	-0.28 -0.343 *	-0.21 -0.37 *	-0.16 -0.124	-0.16 -0.172
Adult Education	-0.07 -0.12	-0.31 -0.476 *	0.11 0.086	-0.07 -0.083
Total: 11 Programs	0.19 0.235	0.25 0.185	0.21 0.204 *	0.24 0.227

Notes: 1. Top indicator in each cell is the correlation coefficient; bottom indicator is the elasticity of aid with respect to the capacity measure.

2. Income is 1988 personal income; RTS data are for 1986.

3. * = elasticity significantly different from zero at the 0.05 level.

The Relationship of Aid to Fiscal Effort to Support Education

Whether aid allocations are systematically related to state fiscal effort is a question to be asked about any federal grant distribution, but the issue is of special interest here because of the emphasis placed on the option of rewarding fiscal effort in the Congressional mandate for this study. The mandate stipulates that

> The study shall consider whether states and local school districts should be rewarded for making greater tax and fiscal efforts in support of general elementary and secondary education through adjustments of allocations under the various Federal financial assistance programs. The study shall investigate various methods of defining tax and fiscal efforts (P.L. 100-297, Sec. 6207).

There is no general agreement among policymakers or analysts that high-effort states should, as a matter of policy, receive more aid than low-effort states, but no one seems to have suggested that a relationship in the opposite direction is desirable. Because the fund distribution formulas contain no fiscal effort factors, any relationship that exists is not there by design. Nevertheless, the nature of the current relationship is relevant in deciding whether explicit fiscal effort factors should be added to education aid formulas in the future.

A serious but unavoidable limitation of any analysis of aid-to-effort relationships in education is that gaps in the data make it impossible to determine how aid allocations are related to program-specific measures of effort. For instance, because there are no data on how much nonfederal money each state devotes to vocational education, there is no way to determine how state-local fiscal effort to support vocational education correlates with federal vocational education aid. Similarly, because there are no satisfactory data on how much states spend to educate their handicapped or disadvantaged pupils, it is not possible to measure state fiscal effort to support programs for these groups.[14] The only effort indicators that can now

be quantified and correlated with federal aid are indicators of fiscal effort to support elementary and secondary education in general.

Table 14 presents statistical indicators of association between total aid per K-12 enrollee under the 11 major programs and four such fiscal effort indicators. Each indicator is defined (as explained in Chapter 2) as the ratio of state-local education revenue to fiscal capacity, and the four measures correspond to the four measures of capacity shown in Table 12. All the correlation coefficients in Table 14 are very small, and all the elasticity measures are near zero. Unambiguously, there is *no* relationship, under the current formulas, between the aggregate amount of federal education aid a state receives under the major federal grant programs and the state's fiscal effort to support elementary-secondary education.

A program-by-program analysis confirms the general absence of relationships between aid allocations and state fiscal effort to support education. The correlations between aid amounts and the various fiscal effort measures is small and insignificant for 10 out of the 11 individual grant programs (the details are not shown here). That the relationship appears to be significantly positive for one program, Chapter 1 Grants for the Handicapped, is something of an accident: the few states that draw on that program extensively happen to be high-effort states, and so aid allocations and effort are positively correlated. In general, however, the existing fund allocation methods neither reward nor penalize states for exerting above-average effort.

Note in particular that there is no significant positive relationship between fiscal effort and aid per pupil under the Chapter 1 Grants to LEAs program, even though the Chapter 1 formula ties aid directly to each state's level of per-pupil spending. This finding confirms the earlier observation that linking federal aid to effort and linking it to spending are not similar

Table 14

Relationships Between Federal Aid Allocations and State Fiscal Effort: Eleven Major Formula Grants Combined

Fiscal Effort Indicator	Relationship of Federal Aid per K-12 Enrollee to Effort Indicator	
	Correlation Coefficient	Elasticity
Ratio of state-local education revenue to:		
Personal income	0.23	0.084
Gross state product	0.04	-0.009
RTS capacity	0.13	0.086
RRS capacity	-0.02	-0.035

Notes: 1. Income is 1988 personal income; GSP, RTS, and RRS data are for 1986 (the most recent available).

2. None of the elasticities is significantly different from zero at the 0.05 level.

ideas. High-effort states are not necessarily states that spend large, or even above-average, amounts per pupil; hence a positive relationship between aid and per-pupil spending does not imply a positive relationship between aid and fiscal effort.

Relationships of Aid to Selected Demographic Characteristics of States

Another recurrent issue in appraising distributions of federal education funds is how the allocations are related to certain educationally relevant demographic attributes of states. Table 15 uses correlation and elasticity measures to summarize the relationships between total aid per pupil and each of the following demographic characteristics:

- State population (an indicator of size),
- The minority percentage of the state population,
- K-12 public school enrollment (another indicator of size),
- The ratio of enrollment to state population,
- The rate of growth or decline in enrollment,
- The percentage of school-age children from families with incomes below the poverty line in 1979 (the same poverty indicator as is used in allocating Chapter 1 funds),
- The percentage of the whole population from families with incomes below the poverty line in 1979, and
- The estimated percentage of the population below the poverty line in the mid-1980s.[15]

According to the pupil-weighted statistics shown in the table, aid allocations per pupil are negatively related to state size, as measured either by population or enrollment (i.e., small states receive more aid per pupil), but the relationships are not statistically significant. They do become significant, however, when the statistics are calculated on an unweighted rather

Table 15

Relationships Between Federal Aid Allocations and Selected Demographic Characteristics of States: Eleven Major Formula Grants Combined

Demographic Characteristic	Relationship of Federal Aid per K-12 Enrollee to Demographic Characteristic	
	Correlation Coefficient	Elasticity
Population and enrollment		
State population, 1988	-0.08	-0.029
Percent minority population	0.14	0.063
Enrollment, fall 1987	-0.13	-0.039
Enrollment-to-population ratio	-0.17	-0.555 *
Enrollment growth, 1985-87	-0.18	NA
Poverty rates		
Children ages 5-17 in 1979	0.24	0.277 *
All persons in 1979	0.18	0.227
All persons, mid-1980s estimates	0.10	0.114 *

Note: * = elasticity significantly different from zero at the 0.05 level.

than a pupil-weighted basis. This negative relationship between aid and size reflects the high per-pupil allocations received by a dozen or so of the least-populous states (because of, among other things, the lower-bound provisions in several aid formulas). It is more properly characterized as a "small state" effect than as a size effect per se.

Aid per pupil is negatively related to state enrollment rates, or enrollment-to-population ratios--that is, states with smaller fractions of their population enrolled in K-12 public education tend to receive larger aid allocations per enrollee. This is partly because funds under certain programs are distributed according to population variables rather than enrollment variables and partly because the higher-income, higher-spending states, which tend to receive larger per-pupil allocations, also tend to have lower enrollment rates.

Aid allocations also are negatively related to rates of enrollment growth--that is, states whose K-12 enrollments are growing slowly or are declining tend to receive larger grants per enrollee than states whose enrollments are growing rapidly. This negative relationship stems partly from data lags. When two-year-old population data are used to allocate aid, for example, the effect is to give growing states less aid (and declining states more aid) than their current populations would justify. In addition, the relationship is negative because the more rapidly growing states tend to spend less per pupil on education and hence to receive less aid under certain formulas than slow-growing or declining states.

Total federal aid per pupil under the 11 programs is positively associated with state poverty rates. The association is strongest in relation to the 1979 child poverty rate, which is, of course, the variable used in distributing funds under the Chapter 1 Grants to LEAs program. The association is weaker, but still positive, in relation to rates of poverty in the general population.

Finally, the correlation between total federal aid per pupil and the minority percentage of a state's population also is positive, but the relationship is not statistically significant.

An analysis of relationships between aid amounts and demographic characteristics by program has also been conducted, but the detailed results are too voluminous to present here. The principal findings are as follows:

1. The positive relationship between total aid per pupil and state poverty rates turns out to be attributable mainly, if not entirely, to the role played by the 1979 child poverty count in distributing Chapter 1 Grants to LEAs. Correlations between allocations under other programs and poverty rates are positive in some instances and negative in others, but none is statistically significant.

2. Allocations under the Chapter 2 Block Grants, Drug-Free Schools, Mathematics and Science, Vocational Education, and Adult Education programs are all negatively associated with state size, the obvious reason being that all five programs have lower-bound provisions that raise the aid allocations of small states.

3. There are significant positive relationships between allocations under the Chapter 1, Migrant Education, and Impact Aid programs and the minority percentages of state populations, but the relationship in Vocational Education is in the opposite direction.

4. States with high enrollment-to-population ratios get less aid per K-12 enrollee under several programs, including Chapter 1 Grants to LEAs, Mathematics and Science, and both EHA Basic Grants and Chapter 1 Grants for the Handicapped.

5. Finally, states with growing enrollment tend to receive less aid per pupil than states with declining enrollment under nearly all programs--the notable exception being Migrant Education, which directs most of its funds to the growing states of the West and Southwest.

RELATIONSHIPS BETWEEN AID ALLOCATIONS AND FORMULA DESIGNS

Now that both the fund distribution methods and the distributional outcomes have been examined, the stage is set for analyzing relationships between the two. This analysis has three purposes: (1) to explain and demonstrate how the major fund allocation formulas operate in

practice, (2) to make clear why states fall where they do along the aid distributions, and (3) to establish the relevance of some of the formula alternatives examined in Chapter 4. The discussion deals, in sequence, with the following large grant programs or combinations thereof: Chapter 1 Grants to LEAs (both its Basic Grant and Concentration Grant components), Chapter 2 Block Grants, aid for the handicapped (all three major programs), and Vocational Education. The Impact Aid program is then discussed only briefly because LEA-level data are needed to analyze it properly. The remaining smaller grant programs are discussed even more briefly at the end.

Table 16 contains the data needed to describe distributional patterns under all the programs. These are the same data that were shown in Table 5, but they are rearranged to show the states in rank-order of aid per K-12 enrollee under each program. The rank-ordered table (actually a set of subtables, one for each program) makes it easy to see where each state stands relative to other states as a recipient of each type of elementary-secondary aid.

Chapter 1 Grants to LEAs

The largest elementary-secondary aid program, Chapter 1 Grants to LEAs, distributed just over $4 billion in FY 1989, or an average of $96.51 per K-12 pupil in the United States. The pattern of interstate variations in aid is shown graphically in Figure 3 and numerically in Table 16a. The rank-ordered data reveal a somewhat surprising pattern in which such high-income northeastern states as New York, New Jersey, Delaware, and Pennsylvania are interspersed at the top of the aid distribution with such poor southern states as Mississippi, Louisiana, and Alabama. This unlikely configuration results mainly from the interaction between the two factors in the Chapter 1 Basic Grant formula--the number of low-income children in each state in 1979 (according to the 1980 Census) and the bounded per-pupil

Table 16

Aid per Pupil, States in Rank Order, by Program, Fiscal Year 1989

a. Chapter 1 Grants to LEAs

State	$ per Pupil	Rank
District of Columbia	215.54	1
New York	167.19	2
Mississippi	154.36	3
New Jersey	122.23	4
Louisiana	121.71	5
Delaware	120.39	6
Alabama	118.86	7
Pennsylvania	117.24	8
Rhode Island	114.74	9
Massachusetts	113.21	10
West Virginia	112.99	11
Kentucky	112.70	12
Arkansas	109.86	13
New Mexico	108.22	14
Illinois	105.20	15
Georgia	103.08	16
Tennessee	102.73	17
South Carolina	102.02	18
Florida	97.69	19
Michigan	97.67	20
Maryland	97.48	21
South Dakota	96.51	22
50 States + D.C.	96.51	
Connecticut	92.56	23
Vermont	91.86	24
Maine	89.06	25
North Carolina	87.17	26
California	85.80	27
Missouri	81.75	28
Virginia	81.49	29
Montana	79.63	30
Texas	79.58	31
Arizona	77.36	32
Ohio	77.26	33
Wisconsin	77.06	34
North Dakota	74.77	35
Nebraska	71.99	36
Hawaii	71.45	37
Iowa	70.42	38
Oregon	70.19	39
Oklahoma	67.85	40
Minnesota	66.34	41
Colorado	64.93	42
Alaska	64.67	43
Indiana	64.37	44
Kansas	61.06	45
Washington	58.52	46
New Hampshire	56.34	47
Idaho	55.73	48
Wyoming	52.21	49
Nevada	42.38	50
Utah	33.03	51

b. Migrant Education

State	$ per Pupil	Rank
Alaska	65.83	1
California	18.86	2
Oregon	16.29	3
Maine	15.69	4
Idaho	15.11	5
Washington	14.52	6
Texas	13.75	7
Florida	13.47	8
Arizona	11.78	9
Arkansas	9.31	10
Kansas	8.82	11
Vermont	7.58	12
Delaware	7.01	13
50 States + D.C.	6.50	
Michigan	5.78	14
Massachusetts	5.66	15
North Dakota	5.10	16
Connecticut	4.91	17
Louisiana	4.53	18
New Mexico	4.27	19
Colorado	4.17	20
Mississippi	3.86	21
Nevada	3.32	22
Kentucky	2.95	23
Wyoming	2.74	24
Minnesota	2.62	25
Alabama	2.51	26
Georgia	2.39	27
North Carolina	2.29	28
Montana	2.27	29
New York	2.24	30
Oklahoma	1.71	31
New Jersey	1.64	32
Utah	1.53	33
Nebraska	1.45	34
Pennsylvania	1.43	35
Illinois	1.07	36
Wisconsin	1.01	37
Missouri	0.97	38
Rhode Island	0.97	39
Indiana	0.94	40
District of Columbia	0.81	41
Ohio	0.75	42
New Hampshire	0.66	43
Maryland	0.58	44
South Dakota	0.47	45
South Carolina	0.45	46
Virginia	0.38	47
Tennessee	0.21	48
Iowa	0.18	49
West Virginia	0.12	50
Hawaii	0.00	51

c. Chapter 2 Block Grants

State	$ per Pupil	Rank
District of Columbia	27.08	1
Vermont	24.56	2
Delaware	23.75	3
Wyoming	23.48	4
Alaska	21.56	5
North Dakota	19.32	6
South Dakota	18.09	7
Rhode Island	17.19	8
Montana	15.09	9
Hawaii	13.71	10
New Hampshire	13.55	11
Nevada	13.01	12
Pennsylvania	12.08	13
New Jersey	11.82	14
Illinois	11.74	15
New York	11.73	16
Louisiana	11.46	17
Wisconsin	11.42	18
Connecticut	11.36	19
Missouri	11.30	20
Ohio	11.25	21
Kentucky	11.22	22
50 States + D.C.	11.21	
Mississippi	11.17	23
Massachusetts	11.15	24
Maryland	11.14	25
Georgia	11.02	26
Alabama	11.00	27
Michigan	10.99	28
Indiana	10.90	29
Tennessee	10.89	30
Iowa	10.87	31
Nebraska	10.87	32
South Carolina	10.78	33
Maine	10.78	34
West Virginia	10.76	35
Idaho	10.70	36
Florida	10.66	37
Arizona	10.66	38
North Carolina	10.64	39
Oklahoma	10.61	40
Arkansas	10.55	41
Minnesota	10.51	42
California	10.50	43
Colorado	10.47	44
Oregon	10.41	45
Kansas	10.41	46
New Mexico	10.34	47
Texas	10.28	48
Virginia	10.24	49
Washington	10.14	50
Utah	10.01	51

(continued)

Table 16 (continued)

Aid per Pupil, States in Rank Order, by Program, Fiscal Year 1989

d. Mathematics and Science

State	$ per Pupil	Rank
District of Columbia	7.49	1
Vermont	6.80	2
Delaware	6.57	3
Wyoming	6.50	4
Alaska	5.97	5
North Dakota	5.35	6
South Dakota	5.01	7
Rhode Island	4.76	8
Montana	4.17	9
New York	4.08	10
Hawaii	3.79	11
New Hampshire	3.75	12
Mississippi	3.69	13
Nevada	3.60	14
Pennsylvania	3.52	15
Louisiana	3.44	16
New Jersey	3.43	17
Massachusetts	3.42	18
Illinois	3.25	19
Kentucky	3.19	20
Arkansas	3.18	21
Alabama	3.12	22
Florida	3.09	23
50 States + D.C.	3.09	
West Virginia	3.08	24
Michigan	3.05	25
Connecticut	3.05	26
Maryland	2.98	27
Maine	2.98	28
Tennessee	2.97	29
Idaho	2.96	30
South Carolina	2.94	31
Georgia	2.92	32
New Mexico	2.92	33
California	2.91	34
Oregon	2.81	35
Texas	2.78	36
North Carolina	2.75	37
Ohio	2.73	38
Wisconsin	2.72	39
Missouri	2.72	40
Iowa	2.64	41
Arizona	2.61	42
Indiana	2.60	43
Nebraska	2.57	44
Virginia	2.57	45
Oklahoma	2.52	46
Kansas	2.52	47
Colorado	2.51	48
Washington	2.50	49
Minnesota	2.48	50
Utah	2.23	51

e. Drug-Free Schools

State	$ per Pupil	Rank
District of Columbia	16.76	1
Vermont	15.21	2
Delaware	14.70	3
Wyoming	14.53	4
Alaska	13.35	5
North Dakota	11.96	6
South Dakota	11.20	7
Rhode Island	10.64	8
Montana	9.34	9
Hawaii	8.49	10
New Hampshire	8.39	11
Nevada	8.05	12
Pennsylvania	7.48	13
New Jersey	7.32	14
Illinois	7.27	15
New York	7.26	16
Louisiana	7.09	17
Wisconsin	7.07	18
Connecticut	7.03	19
Missouri	6.99	20
Ohio	6.96	21
Kentucky	6.95	22
50 States + D.C.	6.94	
Mississippi	6.92	23
Massachusetts	6.90	24
Maryland	6.90	25
Georgia	6.82	26
Alabama	6.81	27
Michigan	6.81	28
Indiana	6.74	29
Tennessee	6.74	30
Iowa	6.73	31
Nebraska	6.73	32
South Carolina	6.68	33
Maine	6.68	34
West Virginia	6.66	35
Idaho	6.62	36
Florida	6.60	37
Arizona	6.60	38
North Carolina	6.59	39
Oklahoma	6.57	40
Arkansas	6.53	41
Minnesota	6.51	42
California	6.50	43
Colorado	6.48	44
Oregon	6.45	45
Kansas	6.44	46
New Mexico	6.40	47
Texas	6.36	48
Virginia	6.34	49
Washington	6.28	50
Utah	6.19	51

f. Impact Aid

State	$ per Pupil	Rank
Alaska	697.41	1
Montana	152.13	2
Hawaii	128.94	3
New Mexico	128.12	4
South Dakota	112.90	5
Arizona	99.69	6
North Dakota	78.37	7
Wyoming	72.18	8
District of Columbia	51.58	9
Oklahoma	42.51	10
Virginia	38.44	11
Washington	34.00	12
Nebraska	33.04	13
Kansas	23.66	14
Idaho	22.44	15
Utah	22.12	16
Rhode Island	20.61	17
Nevada	19.48	18
50 States + D.C.	15.94	
New Hampshire	15.92	19
Maine	14.73	20
California	14.19	21
Connecticut	14.15	22
Colorado	13.15	23
Massachusetts	13.08	24
South Carolina	12.06	25
Maryland	11.23	26
New Jersey	11.10	27
Louisiana	10.60	28
Alabama	8.64	29
North Carolina	8.33	30
Texas	8.23	31
Mississippi	7.76	32
Wisconsin	7.65	33
Missouri	7.56	34
Florida	7.54	35
Minnesota	7.00	36
Oregon	6.83	37
Georgia	6.68	38
Illinois	6.07	39
Arkansas	5.21	40
New York	4.27	41
Michigan	4.12	42
Tennessee	3.95	43
Ohio	2.54	44
Pennsylvania	1.86	45
Indiana	1.76	46
Kentucky	1.70	47
Delaware	0.39	48
Iowa	0.38	49
West Virginia	0.19	50
Vermont	0.07	51

(continued)

Table 16 (continued)

Aid per Pupil, States in Rank Order, by Program, Fiscal Year 1989

g. EHA Basic Grants

State	$ per Pupil	Rank
Massachusetts	54.16	1
New Jersey	52.05	2
Rhode Island	48.00	3
Alabama	47.16	4
Connecticut	43.33	5
West Virginia	43.14	6
Maine	42.39	7
Maryland	42.34	8
Tennessee	40.87	9
South Carolina	40.69	10
Missouri	40.55	11
Iowa	39.17	12
Virginia	38.98	13
Florida	38.73	14
Mississippi	38.68	15
Nebraska	38.55	16
Alaska	38.29	17
Pennsylvania	38.25	18
Kentucky	38.22	19
Illinois	38.16	20
Minnesota	37.19	21
South Dakota	36.59	22
Oklahoma	36.34	23
Vermont	36.31	24
Ohio	35.78	25
Delaware	35.77	26
New Mexico	35.72	27
50 States + D.C.	35.68	
Indiana	34.86	28
North Carolina	34.26	29
Arkansas	33.77	30
North Dakota	33.70	31
New York	33.58	32
Wyoming	33.11	33
Montana	33.00	34
Wisconsin	32.93	35
Oregon	32.87	36
New Hampshire	32.76	37
Kansas	32.09	38
Utah	31.90	39
Texas	31.53	40
Michigan	31.53	41
Arizona	31.12	42
California	30.88	43
Washington	30.80	44
Idaho	29.93	45
Nevada	29.22	46
Colorado	28.78	47
Louisiana	27.61	48
Georgia	27.37	49
Hawaii	23.48	50
District of Columbia	11.69	51

h. EHA Preschool Grants

State	$ per Pupil	Rank
Idaho	26.61	1
Alabama	13.45	2
New York	10.12	3
Washington	10.04	4
Pennsylvania	9.49	5
Virginia	9.29	6
Kentucky	8.82	7
Arkansas	8.08	8
Maine	7.81	9
South Dakota	7.64	10
South Carolina	7.52	11
Illinois	7.46	12
North Dakota	7.20	13
New Jersey	7.16	14
Massachusetts	6.70	15
Maryland	6.60	16
Kansas	6.30	17
Wisconsin	6.29	18
North Carolina	6.22	19
Minnesota	6.10	20
50 States + D.C.	5.88	
Georgia	5.83	21
Iowa	5.74	22
Tennessee	5.58	23
Alaska	5.38	24
Louisiana	5.35	25
West Virginia	5.33	26
California	5.20	27
Montana	5.14	28
Connecticut	5.11	29
Nebraska	4.95	30
Oklahoma	4.58	31
Mississippi	4.33	32
Arizona	4.22	33
District of Columbia	4.15	34
Michigan	4.15	35
Utah	4.01	36
Texas	3.82	37
Rhode Island	3.58	38
New Hampshire	3.50	39
Colorado	3.44	40
Hawaii	3.35	41
Wyoming	2.94	42
Vermont	2.71	43
New Mexico	2.71	44
Nevada	2.71	45
Florida	2.35	46
Oregon	2.17	47
Missouri	2.15	48
Ohio	2.06	49
Indiana	1.85	50
Delaware	0.98	51

i. Chapter 1 Handicapped Grants

State	$ per Pupil	Rank
District of Columbia	31.87	1
Delaware	23.29	2
Vermont	17.52	3
Alaska	17.23	4
Massachusetts	12.94	5
Illinois	12.47	6
Oregon	10.42	7
New York	8.75	8
Pennsylvania	8.60	9
Wyoming	7.95	10
Connecticut	6.39	11
Michigan	5.06	12
Colorado	4.75	13
Indiana	4.63	14
Rhode Island	4.46	15
50 States + D.C.	3.67	
New Jersey	3.65	16
Arkansas	3.36	17
Kansas	3.27	18
New Hampshire	3.22	19
Maine	2.87	20
Montana	2.81	21
North Dakota	2.77	22
Washington	2.64	23
Ohio	2.64	24
Wisconsin	2.50	25
West Virginia	2.35	26
Kentucky	2.34	27
Florida	2.33	28
Louisiana	2.27	29
Utah	2.17	30
Texas	1.88	31
Maryland	1.83	32
South Dakota	1.68	33
Nevada	1.64	34
Iowa	1.46	35
Missouri	1.46	36
Hawaii	1.38	37
Georgia	1.25	38
Arizona	1.22	39
North Carolina	1.09	40
Virginia	0.87	41
Tennessee	0.76	42
Mississippi	0.75	43
Oklahoma	0.70	44
South Carolina	0.68	45
Nebraska	0.56	46
New Mexico	0.43	47
Idaho	0.39	48
Alabama	0.39	49
California	0.35	50
Minnesota	0.35	51

(continued)

Table 16 (continued)

Aid per Pupil, States in Rank Order, by Program, Fiscal Year 1989

j. Vocational Education

State	$ per Pupil	Rank
District of Columbia	48.60	1
Vermont	44.09	2
Delaware	42.63	3
Wyoming	42.14	4
Alaska	38.70	5
North Dakota	34.69	6
South Dakota	32.47	7
Rhode Island	30.85	8
Montana	27.08	9
Hawaii	24.60	10
New Hampshire	24.32	11
Kentucky	23.43	12
Nevada	23.35	13
Pennsylvania	23.23	14
North Carolina	22.89	15
South Carolina	22.87	16
Tennessee	22.79	17
Alabama	22.59	18
Louisiana	22.58	19
West Virginia	22.27	20
Mississippi	21.65	21
Arkansas	21.27	22
Wisconsin	21.10	23
Massachusetts	21.04	24
Indiana	20.99	25
Missouri	20.92	26
Georgia	20.77	27
Oklahoma	20.75	28
Ohio	20.71	29
Maine	20.56	30
Iowa	20.22	31
New Mexico	20.22	32
Florida	20.18	33
50 States + D.C.	20.14	
New York	19.96	34
Michigan	19.76	35
Arizona	19.72	36
Nebraska	19.69	37
Oregon	19.47	38
Illinois	19.35	39
Idaho	19.20	40
Virginia	18.94	41
Maryland	18.93	42
Minnesota	18.49	43
New Jersey	18.20	44
Colorado	18.08	45
Kansas	17.98	46
Texas	17.93	47
Connecticut	17.74	48
Washington	17.69	49
California	15.65	50
Utah	15.39	51

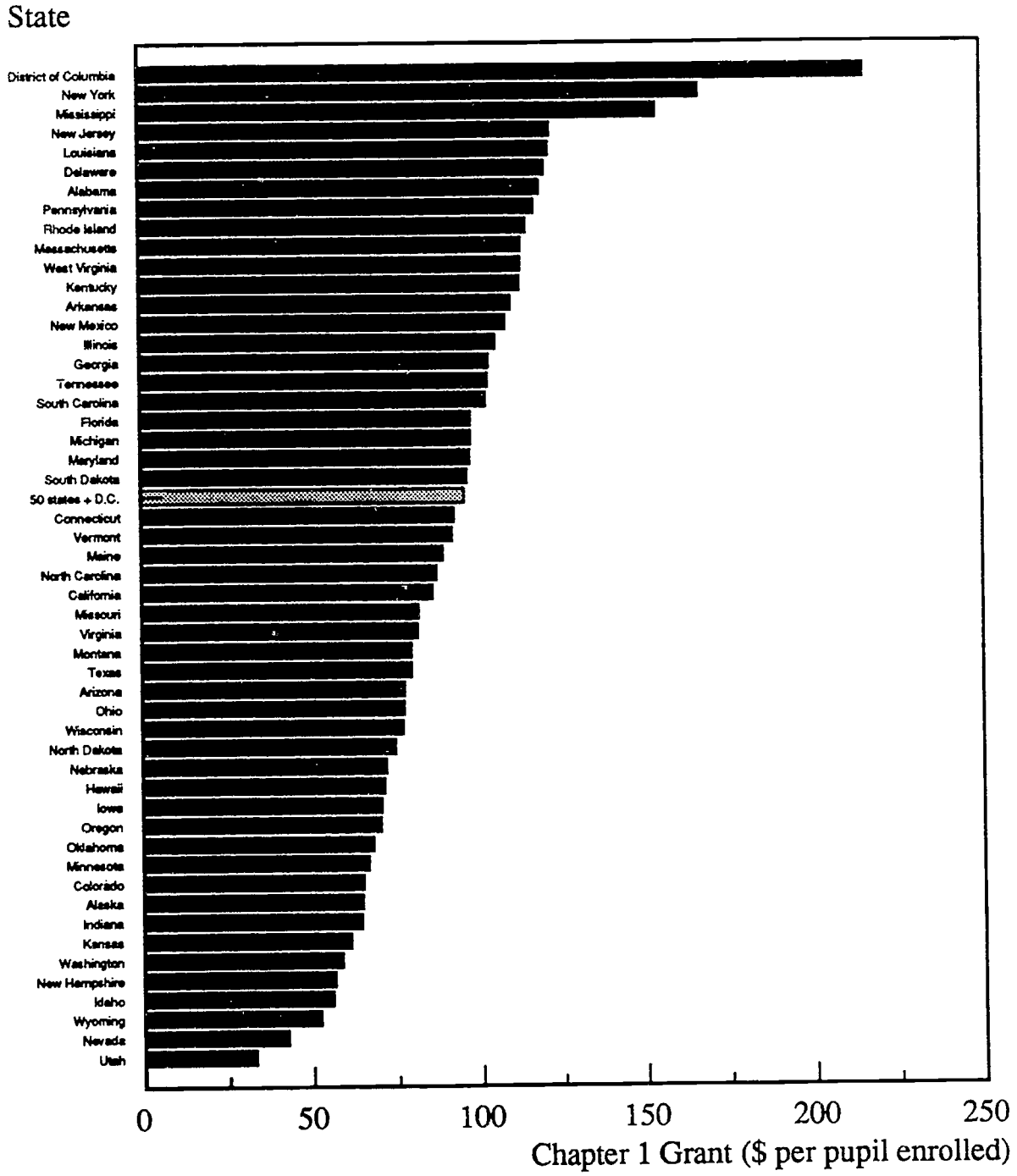
k. Adult Education

State	$ per Pupil	Rank
District of Columbia	7.13	1
Rhode Island	6.15	2
Delaware	5.66	3
Vermont	5.18	4
North Dakota	4.84	5
South Dakota	4.65	6
West Virginia	4.56	7
Kentucky	4.37	8
Wyoming	4.35	9
Pennsylvania	4.09	10
Arkansas	4.08	11
Tennessee	4.01	12
New Hampshire	3.94	13
North Carolina	3.90	14
Hawaii	3.88	15
Montana	3.84	16
Alabama	3.83	17
Maine	3.83	18
Connecticut	3.82	19
South Carolina	3.82	20
New Jersey	3.81	21
Missouri	3.79	22
Mississippi	3.78	23
New York	3.78	24
Louisiana	3.61	25
Maryland	3.57	26
Alaska	3.55	27
Illinois	3.50	28
Massachusetts	3.49	29
Virginia	3.46	30
Nebraska	3.43	31
Georgia	3.42	32
Nevada	3.35	33
Iowa	3.32	34
50 States + D.C.	3.31	
Ohio	3.30	35
Florida	3.27	36
Indiana	3.26	37
Wisconsin	3.24	38
Oklahoma	3.23	39
Michigan	3.10	40
New Mexico	3.03	41
Kansas	3.02	42
Idaho	3.02	43
Oregon	2.93	44
Minnesota	2.79	45
Arizona	2.59	46
Texas	2.57	47
Colorado	2.40	48
California	2.38	49
Washington	2.38	50
Utah	1.68	51

l. Total: 11 Major Programs

State	$ per Pupil	Rank
Alaska	971.92	1
District of Columbia	422.70	2
Montana	334.50	3
South Dakota	327.20	4
New Mexico	322.37	5
Hawaii	283.08	6
Delaware	281.14	7
North Dakota	278.06	8
New York	272.96	9
Arizona	267.55	10
Wyoming	262.13	11
Rhode Island	261.93	12
Mississippi	256.96	13
Vermont	251.88	14
Massachusetts	251.74	15
New Jersey	242.42	16
Alabama	238.36	17
Pennsylvania	227.26	18
Louisiana	220.25	19
Maine	217.38	20
Kentucky	215.87	21
Illinois	215.55	22
Arkansas	215.20	23
West Virginia	211.44	24
Virginia	211.00	25
South Carolina	210.50	26
Connecticut	209.46	27
50 States + D.C.	207.86	
Florida	205.91	28
Maryland	203.58	29
Tennessee	201.50	30
Oklahoma	197.36	31
Nebraska	193.82	32
California	193.23	33
Idaho	192.73	34
Michigan	192.03	35
Georgia	191.54	36
Washington	189.51	37
North Carolina	186.14	38
Oregon	180.85	39
Missouri	180.16	40
Texas	178.70	41
Kansas	175.57	42
Wisconsin	173.00	43
New Hampshire	166.36	44
Ohio	165.98	45
Iowa	161.13	46
Minnesota	160.37	47
Colorado	159.15	48
Indiana	152.93	49
Nevada	150.12	50
Utah	130.26	51

Figure 3
Interstate Variation in Per-Pupil Allocations of Chapter 1 Grants for the Disadvantaged, Fiscal Year 1989



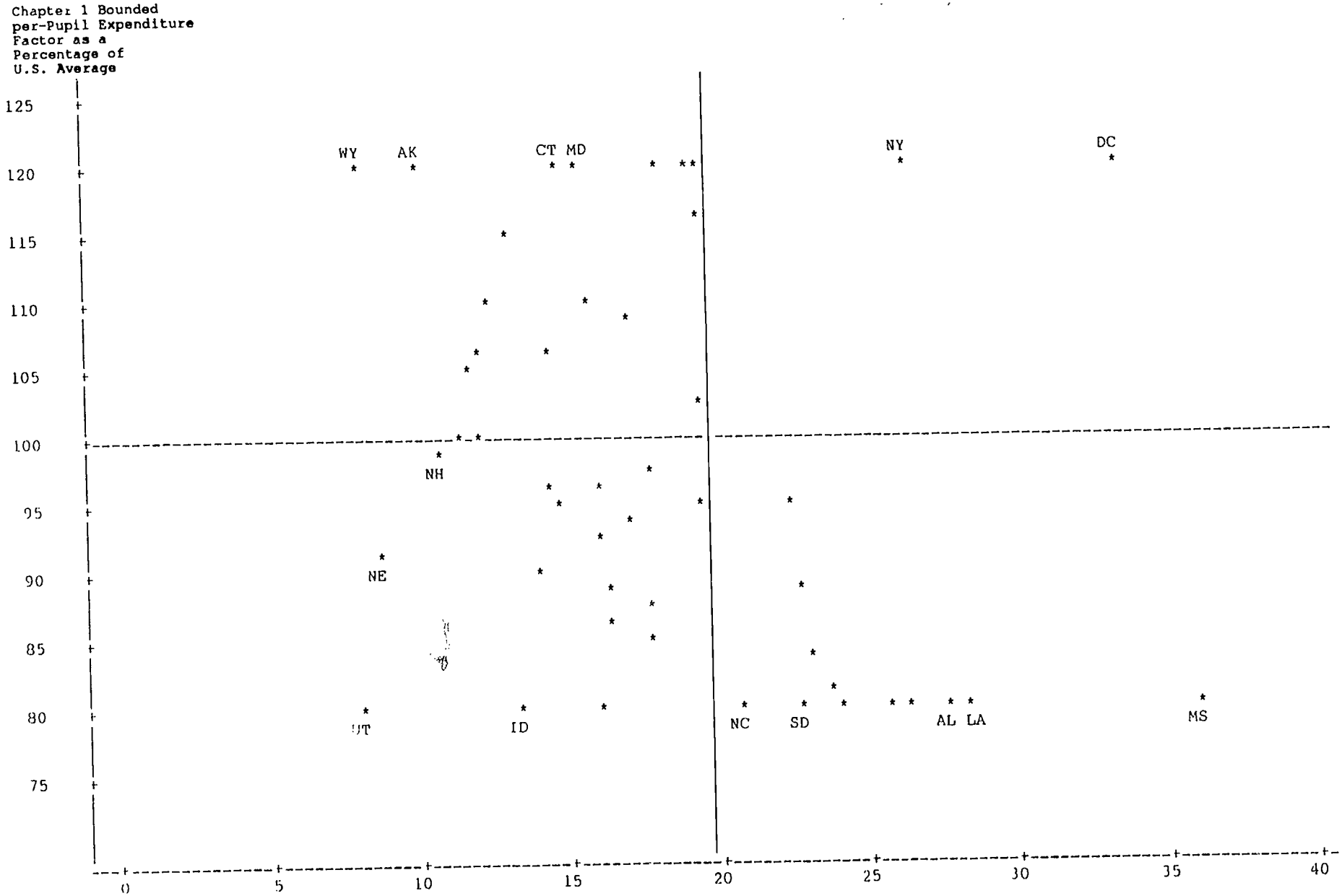
expenditure factor. In addition, the Concentration Grant formula, which gives extra aid to places with high percentages or large numbers of low-income children, affects the distribution but to an extent limited by its 4.3 percent share of the program's total funds.

To understand how the formula places New York and Mississippi together in the highest-aid category, it is necessary to examine the relationship between the two main formula factors, which is depicted in the scatter plot in Figure 4. In this diagram, the number of Chapter 1 eligibles (low-income children counted for the purpose of allocating aid), expressed as a percentage of each state's K-12 enrollment, is measured along the horizontal axis, and the bounded per-pupil expenditure factor, expressed as a percentage of the U.S. average, is measured vertically. The line running horizontally across the middle of the diagram indicates the average value of the adjustment factor; states above that line spend more than the U.S.-average amount per pupil, and states below that line spend below-average amounts. The line running vertically through the center of the diagram represents the average value of the percentage of Chapter 1 eligibles; states to the right of it have above-average concentrations of eligibles, while states to the left of it have below-average concentrations. Note that because the per-pupil expenditure factor is limited to between 80 and 120 percent of the U.S. average, many states are clustered at the highest and lowest levels of the scatter plot.

A state can earn a large amount of aid per K-12 enrollee either by having a very high percentage of eligibles, as do Mississippi, Louisiana, and Alabama, or by having a relatively high percentage of eligibles coupled with a high expenditure level, as do New York, New Jersey, and the District of Columbia. States that have low percentages of eligibles and minimum values of the expenditure factor obviously earn the least aid per pupil. Utah, at the lower left of the diagram, has the lowest-earning combination of the two variables, as is

Figure 4

Relationship between the Two Chapter 1 Formula Factors:
Chapter 1 Eligibles (Low-income Children)
and the Bounded per-Pupil Expenditure Factor



reflected in its position at the bottom of the aid distribution. Nevada, Wyoming, Idaho, and New Hampshire, which occupy the next four positions up from the bottom, receive relatively little aid per pupil because of different combinations of low poverty rates and low per-pupil spending. Note that some states that get about average Chapter 1 grants per pupil, like Connecticut and Maryland, have low percentages of eligibles but high per-pupil expenditures, whereas others with about-average allocations, like North Carolina and South Dakota, have above-average percentages of eligibles but low per-pupil outlays.

The interstate distribution pattern would be very different without the per-pupil expenditure factor. Allocations per pupil would depend only on the ratio of eligible low-income children in each state to K-12 enrollment (these ratios are shown in the last column of Table 17). Although the District of Columbia and New York would still rank near the top, states like New Jersey, Delaware, and Pennsylvania would receive only average aid per pupil; the low-income, low-spending states of the South and elsewhere would receive substantially more aid and occupy most of the top positions; and high-income states like Connecticut and Maryland would be near the bottom rather than in the center of the distribution. Utah, Nevada, and Wyoming, however, would remain the states with the smallest grants per K-12 enrollee.

Emphasizing variations in aid per K-12 enrollee may obscure the point that Chapter 1 grants are intended to benefit disadvantaged children rather than the entire student population. Unfortunately, it is not possible to analyze variations in aid per target-group member except in a manner that is almost tautological. The counts of low-income children on which the allocations are based are not only a decade out of date but also do not represent the actual class of beneficiaries--*educationally* deprived children who need special assistance to perform

Table 17

Chapter 1 Grants to LEAs: Aid per Eligible Pupil and per K-12 Enrollee, Fiscal Year 1989

State	Chapter 1 Grant per Eligible Pupil		Chapter 1 Grant per K-12 Enrollee		
	Amount ($)	As Percentage of U.S. Average	Amount ($)	As Percentage of U.S. Average	Eligibles as Percentage of Enrollees
Alabama	429.73	87.3	118.86	121.8	27.7
Alaska	639.29	129.8	64.67	66.3	10.1
Arizona	476.87	96.8	77.36	79.3	16.2
Arkansas	428.47	87.0	109.86	112.5	25.6
California	501.97	101.9	85.80	87.9	17.1
Colorado	551.49	112.0	64.93	66.5	11.8
Connecticut	627.78	127.5	92.56	94.8	14.7
Delaware	632.09	128.3	120.39	123.3	19.1
District of Columbia	645.19	131.0	215.54	220.8	33.4
Florida	508.75	103.3	97.69	100.1	19.2
Georgia	450.10	91.4	103.08	105.6	22.9
Hawaii	502.48	102.0	71.45	73.2	14.2
Idaho	420.46	85.4	55.73	57.1	13.3
Illinois	544.87	110.6	105.20	107.8	19.3
Indiana	462.84	94.0	64.37	65.9	13.9
Iowa	496.29	100.8	70.42	72.1	14.2
Kansas	515.15	104.6	61.06	62.6	11.9
Kentucky	427.31	86.8	112.70	115.5	26.4
Louisiana	427.34	86.8	121.71	124.7	28.5
Maine	506.37	102.8	89.06	91.2	17.6
Maryland	629.42	127.8	97.48	99.9	15.5
Massachusetts	632.62	128.5	113.21	116.0	17.9
Michigan	573.58	116.5	97.67	100.1	17.0
Minnesota	551.06	111.9	66.34	68.0	12.0
Mississippi	429.05	87.1	154.36	158.1	36.0
Missouri	462.76	94.0	81.75	83.7	17.7
Montana	554.23	112.5	79.63	81.6	14.4
Nebraska	492.94	100.1	71.99	73.8	14.6
Nevada	482.31	97.9	42.38	43.4	8.8
New Hampshire	520.54	105.7	56.34	57.7	10.8
New Jersey	634.18	128.8	122.23	125.2	19.3
New Mexico	477.34	96.9	108.22	110.9	22.7
New York	637.65	129.5	167.19	171.3	26.2
North Carolina	422.55	85.8	87.17	89.3	20.6
North Dakota	458.58	93.1	74.77	76.6	16.3
Ohio	481.25	97.7	77.26	79.1	16.1
Oklahoma	421.78	85.6	67.85	69.5	16.1
Oregon	562.37	114.2	70.19	71.9	12.5
Pennsylvania	605.98	123.0	117.24	120.1	19.4
Rhode Island	634.24	128.8	114.74	117.5	18.1
South Carolina	430.80	87.5	102.02	104.5	23.7
South Dakota	423.11	85.9	96.51	98.9	22.8
Tennessee	428.36	87.0	102.73	105.2	24.0
Texas	454.41	92.3	79.58	81.5	17.5
Utah	417.95	84.9	33.03	33.8	7.9
Vermont	581.02	118.0	91.86	94.1	15.8
Virginia	504.83	102.5	81.49	83.5	16.1
Washington	518.94	105.4	58.52	60.0	11.3
West Virginia	504.44	102.4	112.99	115.7	22.4
Wisconsin	594.21	120.7	77.06	78.9	13.0
Wyoming	652.64	132.5	52.21	53.5	8.0
50 States + D.C.	492.50	100.0	97.62	100.0	19.8

satisfactorily in school. Data on numbers of participants in Chapter 1 programs are available, but they reflect state policies regarding pupil selection and concentration of funds at least as much as they reflect the incidence of educational disadvantage in each state.

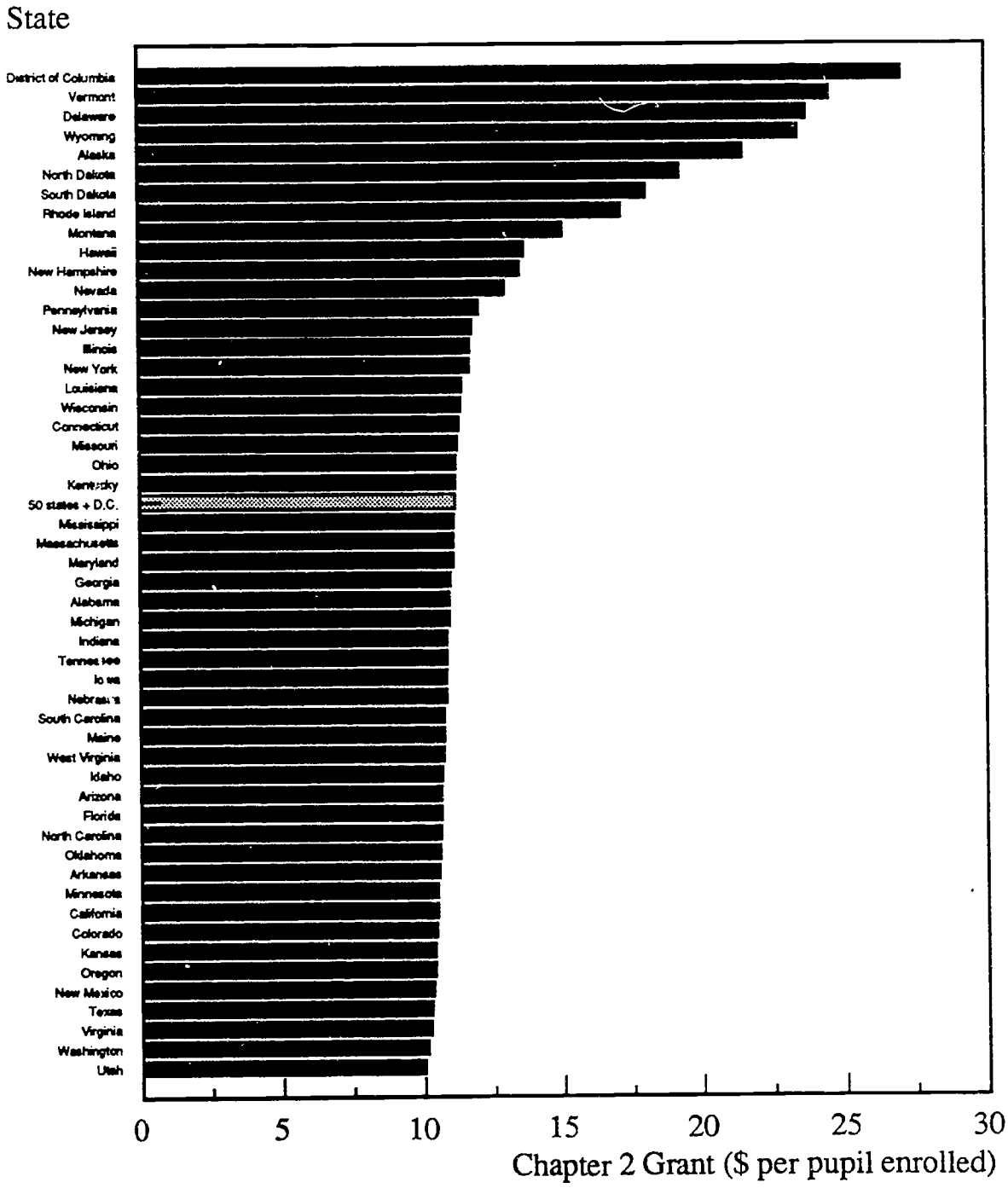
Table 17 shows the amount of aid allocated to each state per eligible pupil--that is, per pupil counted for fund allocation purposes. These figures vary among states, as one would expect, by a factor of about 1.5 to 1, reflecting mainly the influence of the per-pupil expenditure factor in the formula. It would not be correct to conclude, however, for the reasons just mentioned, that the distribution of federal aid relative to the number of "formula eligibles" resembles the distribution of aid relative to needs for compensatory education services. There will be no way to study the latter distribution, despite its importance for evaluating the Chapter 1 allocation formula, until data are produced on the number of children with low educational performance in each state.

Chapter 2 Block Grants

Interstate differences in aid per K-12 enrollee under the Chapter 2 Block Grant program are depicted in Figure 5 (the corresponding data are shown in Table 16c). As can be seen from both the graphic and numerical displays, the lower three-fourths of the interstate distribution is relatively flat, ranging from $10.01 per K-12 pupil in Utah to $12.08 in Pennsylvania. Beginning with Nevada, however, allocations per pupil increase rapidly, reaching highs of $24.56 per pupil for Vermont and $27.08 for the District of Columbia.

Why the distribution pattern has this shape is readily discernible from the Chapter 2 fund distribution formula. As explained earlier, Chapter 2 Block Grants are allocated in proportion to population 5-17, but subject to the restriction that no state may receive less than 1/2 of 1 percent of the total appropriation. Consider first the effects of the allocation

Figure 5
Interstate Variation in per-Pupil Allocations of Chapter 2 Block Grants, Fiscal Year 1989



according to population 5-17 and then the effects of the constraint. Because the basic formula allocates funds according to school-age population rather than enrollment, aid per K-12 enrollee varies as a function of each state's enrollment rate--the ratio of K-12 public school enrollment to population 5-17. The higher the enrollment rate, the less aid per pupil enrolled. There are two reasons why enrollment rates vary. The first is that there are differences across states in the percentages of school-age children who enroll in private school; the higher that percentage, the lower the public school enrollment rate. The second is that more pupils drop out of school in some states than in others; the higher the percentage of dropouts, the lower the enrollment rate. Thus states in which more pupils choose private schools or in which more pupils drop out are "rewarded" for these outcomes by being given a bit more Chapter 2 money per public K-12 enrollee than states with the opposite characteristics.

In addition, there is a more technical source of variation having to do with timing. The per-pupil allocations shown in Figure 5 and Table 16c are based on fall 1988 enrollments, but the population data used to allocate FY 1989 funds according to the formula are for 1987 (the most recent data available at the time the calculations were done). If a state's enrollment is growing, the effect of this time lag is to decrease the state's allocation per fall 1988 enrollee; if a state's enrollment is declining, the effect is to give it more aid per pupil enrolled.[16] This is one reason why states like Utah and Texas, whose enrollments are growing rapidly, are at the bottom of the distribution, while states with declining enrollment like Pennsylvania and New York are in the upper part of the distribution (and would be at the top, were it not for the 1/2 of 1 percent rule).

The effect of guaranteeing each state at least 1/2 of 1 percent of the total Chapter 2 appropriation is, of course, to raise the allocations of small states. The least populous states

each have only 1/5 to 1/4 of 1 percent of the nation's school-age population, not 1/2 of 1 percent, and so the lower-bound rule gives them much more aid than they would have obtained under a strictly proportional distribution. The most extreme examples are that Chapter 2 grants to Delaware, Alaska, Wyoming, Vermont, and the District of Columbia are 200, 206, 220, 229, and 257 percent as large, respectively, with the lower bound in the formula as they would have been without it. At the same time, all states too large to benefit from the constraint lose 2.5 percent of the funds they would otherwise have received.[17]

Aid for Education of the Handicapped

Federal aid for education of the handicapped is provided under three major grant programs: EHA Basic Grants, EHA Preschool Grants, and Chapter 1 Grants for the Handicapped. These distribute, respectively, 79 percent, 13 percent, and 8 percent of all funds distributed under the three combined. Although each program has its own formula, it is more reasonable for the purpose of this analysis to consider the three in combination than each one separately. The reason for combining the EHA Basic Grants and Chapter 1 Grants for the Handicapped programs is that whether a particular handicapped pupil earns federal aid from one or the other depends more on state policies governing placement of the handicapped than on any characteristics of the children themselves. The distinction between these programs is more bureaucratic than substantive. The reason for combining the EHA Basic Grant and Preschool Grant programs is that handicapped children ages 3-5, who constitute the target group for EHA Preschool Grants, are also included among the handicapped children ages 3-21 who are counted for the purpose of allocating EHA Basic Grants. The Preschool Grants, in other words, offer extra funding, over and above the Basic Grants, for children in the 3-5 age bracket. In essence, three programs serve subsets of the same target group. The variable

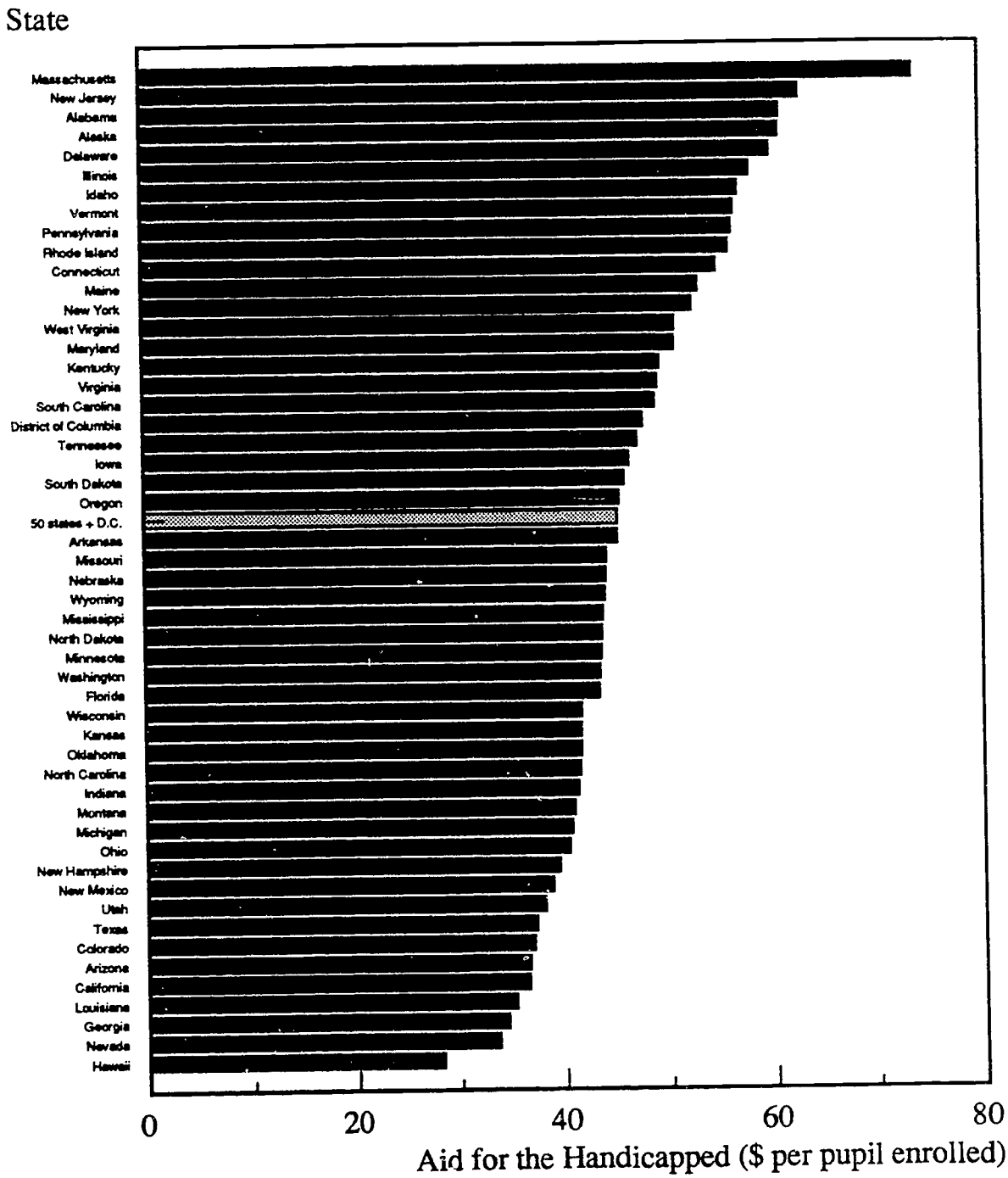
examined here, therefore, is each state's allocation under the three programs combined. Interstate distributions of the combined grants are shown graphically in Figure 6; the data on per-pupil allocations under the individual programs are given in Tables 12g, 12h, and 12i.

Interstate variations in the combined allocations are relatively moderate. Although the three-program totals range from $28.21 per K-12 enrollee in Hawaii to $73.80 per K-12 enrollee in Massachusetts, focusing on these extreme cases substantially exaggerates the degree of variation. The range between the second-lowest state (Nevada) and the second-highest (New Jersey) is only from $33.57 to $62.86--less than a 2-to-1 difference. Nevertheless, there remains significant variation to explain, especially considering that the EHA Basic Grants program, which expends nearly four-fifths of the combined funds, distributes aid as a flat amount per handicapped pupil served.

Because EHA Basic Grants are allocated in direct proportion to numbers of handicapped children ages 3-21 served in special education, the only two reasons for variation in aid per K-12 enrollee under that program are that (1) the ratio of handicapped pupils served to K-12 enrollment varies among states, and (2) states differ in the percentages of handicapped served in LEAs (aided under the EHA Basic Grants program) and in state-operated or state-supported programs (aided under the Chapter 1 Grants for the Handicapped program). Whether children are placed in the LEA-operated or state-operated programs is important because each child counted under the Chapter 1 program for the handicapped earns more federal aid than a child counted under EHA.

The determinants of per-pupil allocations under the two smaller programs are more complex. Funds under the EHA preschool program, like those under the Basic Grants program, are allocated in proportion to the number of children served, but because the

Figure 6
Interstate Variation in per-Pupil Allocations of Aid for the Handicapped, Fiscal Year 1989



Note: Amounts shown are totals of grants under three programs: EHA Basic Grants, EHA Preschool Grants, and Chapter 1 Grants for the Handicapped.

program was in a transitional, or phase-in, status in FY 1989, states differed drastically in percentages of children ages 3-5 enrolled in special education programs.[18] Moreover, under the law, states were entitled to extra aid for 3-to-5-year-olds they *expected* to serve in the following year, and state practices in projecting these numbers apparently varied widely.[19] These two factors explain the drastic variations in EHA Preschool aid per pupil shown in Table 16h.

How many handicapped children a state reports as being served in state-operated or state-supported programs, and hence as being eligible for aid under the Chapter 1 Grants for the Handicapped program depends, as already explained, on whom the state chooses to place in such schools rather than in programs run by LEAs. Some states serve large fractions of their handicapped in state institutions, while others serve hardly any, and so the percentage of K-12 pupils eligible for such aid varies drastically. In addition, because this program is funded under Chapter 1, its formula includes the same adjustment for state per-pupil expenditure as is found in all the other Chapter 1 grant formulas. The combined effects of these two program characteristics produce the extreme range of variation in federal aid per pupil shown in Table 16i.

Differences in the ratio of handicapped pupils served to K-12 enrollment account for most of the interstate variation in aid per pupil under the three programs combined. The value of this ratio for each state is shown in the last column of Table 18. If all aid for the handicapped were given out in strict proportion to the number of pupils served, the interstate variation in aid per K-12 enrollee would be about 85 percent as great as it is under the existing formulas.[20] The remainder of the variation under the actual formulas is attributable to the combined effects of interstate differences in (1) the percentage of handicapped pupils

Table 18

Grants for the Handicapped: Aid per Pupil Served in Special Education and per K-12 Enrollee, Fiscal Year 1989

State	Aid per Handicapped Pupil Served		Aid per K-12 Pupil Enrolled		
	Amount ($)	As Percentage of U.S. Average	Amount ($)	As Percentage of U.S. Average	Pupils Served as Percentage of Enrollment
Alabama	428.31	107.6	60.99	136.0	14.2
Alaska	429.12	107.8	60.89	135.8	14.2
Arizona	381.07	95.7	36.56	81.5	9.6
Arkansas	413.88	104.0	45.20	100.8	10.9
California	390.24	98.1	36.43	81.2	9.3
Colorado	389.83	98.0	36.96	82.4	9.5
Connecticut	391.54	98.4	54.83	122.3	14.0
Delaware	417.34	104.9	60.04	133.9	14.4
District of Columbia	560.80	140.9	47.71	106.4	8.5
Florida	359.33	90.3	43.41	96.8	12.1
Georgia	405.73	101.9	34.45	76.8	8.5
Hawaii	385.58	96.9	28.21	62.9	7.3
Idaho	627.60	157.7	56.94	127.0	9.1
Illinois	423.16	106.3	58.10	129.6	13.7
Indiana	361.77	90.9	41.35	92.2	11.4
Iowa	385.22	96.8	46.37	103.4	12.0
Kansas	406.64	102.2	41.66	92.9	10.3
Kentucky	410.92	103.3	49.38	110.1	12.0
Louisiana	399.47	100.4	35.22	78.6	8.8
Maine	399.74	100.4	53.07	118.4	13.3
Maryland	390.81	98.2	50.77	113.2	13.0
Massachusetts	403.71	101.4	73.79	164.6	18.3
Michigan	394.24	99.1	40.73	90.9	10.3
Minnesota	388.92	97.7	43.64	97.3	11.2
Mississippi	371.48	93.3	43.77	97.6	11.8
Missouri	353.86	88.9	44.16	98.5	12.5
Montana	393.70	98.9	40.95	91.3	10.4
Nebraska	377.29	94.8	44.05	98.2	11.7
Nevada	368.59	92.6	33.56	74.9	9.1
New Hampshire	378.17	95.0	39.49	88.1	10.4
New Jersey	388.29	97.6	62.86	140.2	16.2
New Mexico	359.51	90.3	38.86	86.7	10.8
New York	458.15	115.1	52.46	117.0	11.5
North Carolina	394.59	99.1	41.57	92.7	10.5
North Dakota	407.53	102.4	43.66	97.4	10.7
Ohio	359.05	90.2	40.48	90.3	11.3
Oklahoma	376.05	94.5	41.62	92.8	11.1
Oregon	390.15	98.0	45.47	101.4	11.7
Pennsylvania	437.74	110.0	56.34	125.6	12.9
Rhode Island	371.11	93.2	56.04	125.0	15.1
South Carolina	395.33	99.3	48.89	109.0	12.4
South Dakota	403.65	101.4	45.91	102.4	11.4
Tennessee	379.50	95.4	47.21	105.3	12.4
Texas	376.99	94.7	37.22	83.0	9.9
Utah	377.76	94.9	38.09	84.9	10.1
Vermont	407.11	102.3	56.54	126.1	13.9
Virginia	414.16	104.1	49.14	109.6	11.9
Washington	446.45	112.2	43.48	97.0	9.7
West Virginia	379.00	95.2	50.81	113.3	13.4
Wisconsin	405.37	101.9	41.72	93.0	10.3
Wyoming	393.46	98.9	44.00	98.1	11.2
50 States + D.C.	398.00	100.0	44.84	100.0	11.3

Note: Aid amounts are sums of aid under the EHA Basic Grants, EHA Preschool Grants, and Chapter 1 Grants for the Handicapped Programs.

served under the Chapter 1 Grants for the Handicapped program rather than under EHA and (2) the ratio of the number of children eligible for EHA Preschool Grants to the number eligible for aid under the EHA Basic Grants program.

It would be desirable in the case of aid to the handicapped (as in the previously discussed case of aid to the disadvantaged) to analyze variations in aid per target-group member as well as variations in aid per K-12 enrollee, but again it is difficult to define the target group or to measure its size in a manner that is not tautological. Data on the number of handicapped pupils served in each state are available, of course, because they are the data used in allocating aid, but interstate differences in the number served may reflect differences in state policies as well as differences in the underlying incidence of handicapping conditions. Although the Education of the Handicapped Act requires each state to serve all its handicapped pupils, states have considerable latitude in identifying and classifying handicapped children. That they use this latitude seems evident from the widely varying percentages of children in the 6-17 age range that different states report in the vaguely defined "learning disabled" category, which, by itself, accounts for about 44 percent of all handicapped children served in special education (U.S. Department of Education, Office of Special Education and Rehabilitative Services, 1989). Unfortunately, there are no data on the underlying target group--children who need or could benefit from special education services, as opposed to children who are actually served. States cannot reasonably be expected to make such a statistical distinction, because to acknowledge that some potentially servable children are not served would be to raise questions of compliance with the law.

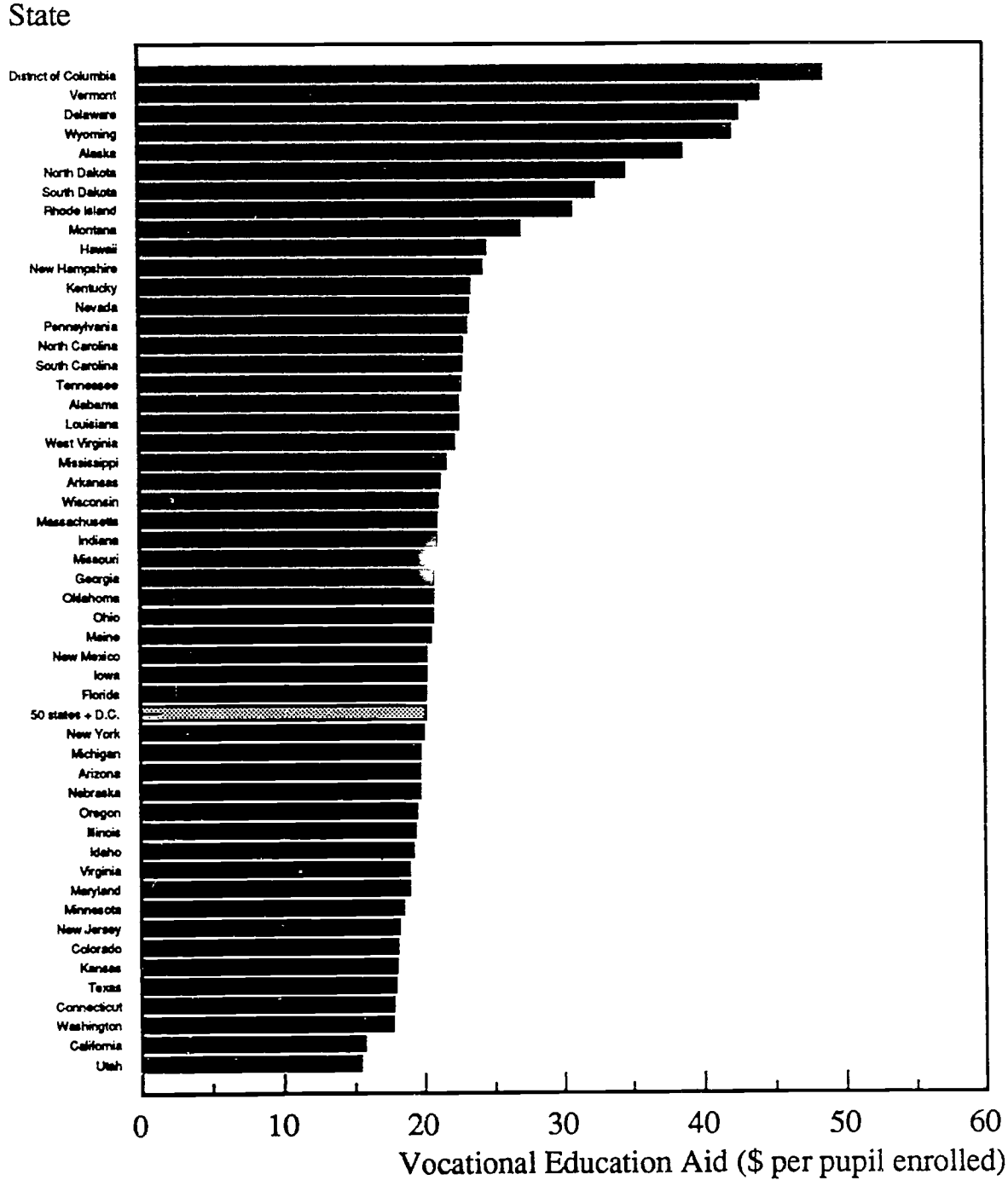
Table 18 does offer a comparison, for what it is worth, between the distributions of aid per K-12 enrollee and aid per reported handicapped pupil served. Naturally, given the

structure of the formula, the latter exhibits less variation among states than the former. The only reason that aid per handicapped pupil served varies at all is that the percentages of those served who fall into the two high-aid categories--handicapped pupils ages 3-5 and handicapped pupils served in state-operated schools--differ among states. Aid per pupil served is especially high in the District of Columbia, for example, because the District is allowed to claim that it serves most of its handicapped pupils in "state" rather than "local" schools and thus to collect most of its aid for the handicapped under the higher-paying Chapter 1 Grants for the Handicapped program. The extent to which allocations vary relative to the "true" incidence of handicapping conditions in each state cannot be determined from existing data.

Vocational Education

The interstate distribution of Vocational Education Basic Grants is shown in Figure 7, and the corresponding numerical data appear in Table 12j. The general shape of the distribution is superficially similar to that of the Chapter 2 Block Grant distribution (Figure 5), in that per-pupil allocations vary only moderately among the states in the bottom three-fourths of the distribution but are sharply higher at the top end. Note that the top 11 states occupy exactly the same positions in both distributions, the obvious reason being that their allocations are wholly determined by the 1/2 of 1 percent minimum allocation rule, which is common to the Vocational Education and Chapter 2 Block Grant formulas. The range of variation among allocations *not* controlled by this constraint is from $15.39 per K-12 enrollee for Utah to $23.43 per enrollee for Kentucky, while the allocations governed by the lower-bound provision reach highs of $44.09 and $48.06 for Vermont and the District of Columbia, respectively.

Figure 7
Interstate Variation in per-Pupil Allocations of Vocational Education Grants, Fiscal Year 1989



As explained earlier, the basic Vocational Education aid formula gives out funds in proportion to the product of a population factor (a weighted sum of populations in the 15-19, 20-24, and 25-65 age strata) and an adjustment factor based on per capita income. The latter is up to 50 percent greater for the lowest-income states than for the highest-income states. These allocations are then subject to the aforementioned 1/2 of 1 percent floor and also to the restriction that no state may receive less aid than it received in FY 1985.

If Vocational Education funds were distributed among states solely in proportion to weighted population, with no constraints and no adjustment for per capita income, aid per K-12 enrollee would vary for only two reasons: (1) interstate variations in the ratio of the weighted population count to K-12 enrollment and (2) the time-lag factor, discussed in connection with Chapter 2 Block Grants, which shifts funds from states with growing enrollments to states whose enrollments are declining. The degree of interstate variation under such a distribution would be only 54 percent of what it is under the actual formula. Reintroducing the adjustment for per capita income would increase the degree of variation to only about 64 percent of its value under the actual formula. The remaining 36 percent of interstate variation is attributable, therefore, to the lower-bound and hold-harmless constraints.[21]

Because federal Vocational Education grants are intended to benefit enrollees in vocational programs rather than pupils in general, an analysis of variations in aid per K-12 enrollee does not provide a complete picture of how funds are distributed. Not only does vocational education aid not serve elementary pupils, but some of it flows, under provisions of the Perkins Act, to postsecondary institutions (mainly two-year colleges) serving students in nonbaccalaureate programs.[22] It is impossible to say how much federal aid each state

receives per enrollee in vocational programs, because vocational enrollment is unmeasured and extremely difficult to define.[23] It is feasible, however, to measure aid in relation to enrollments at the appropriate educational levels. To this end, Table 19 presents figures on allocations of Vocational Education grants relative to the numbers of students in each state enrolled in secondary schools and two-year postsecondary institutions.

As it turns out, the distribution of aid per secondary plus two-year postsecondary enrollee is not dramatically different overall from the distribution of aid per K-12 enrollee. Individual states do, of course, receive different relative amounts of aid per student according to the two different measures, but states that are above average, below average, or about average by one measure almost always fall into the same category according to the other. It cannot be said, therefore, that the distribution of vocational education aid is significantly better matched to the distribution of secondary and two-year postsecondary students among states than to the distribution of K-12 pupils.

Impact Aid

Impact Aid funds are distributed much less evenly among states than grants under any of the other large programs. Allocations per K-12 enrollee vary, in fact, by a factor of 10,000--from $700 per pupil in Alaska to 7 cents per pupil in Vermont. As Figure 8 shows, a few western states--Montana, Hawaii, New Mexico, South Dakota, and Arizona (in addition to Alaska)--obtain $100 or more per K-12 enrollee from Impact Aid. The 10 states that receive $20 million or more each under the program account for more than 60 percent of all Impact Aid funds.

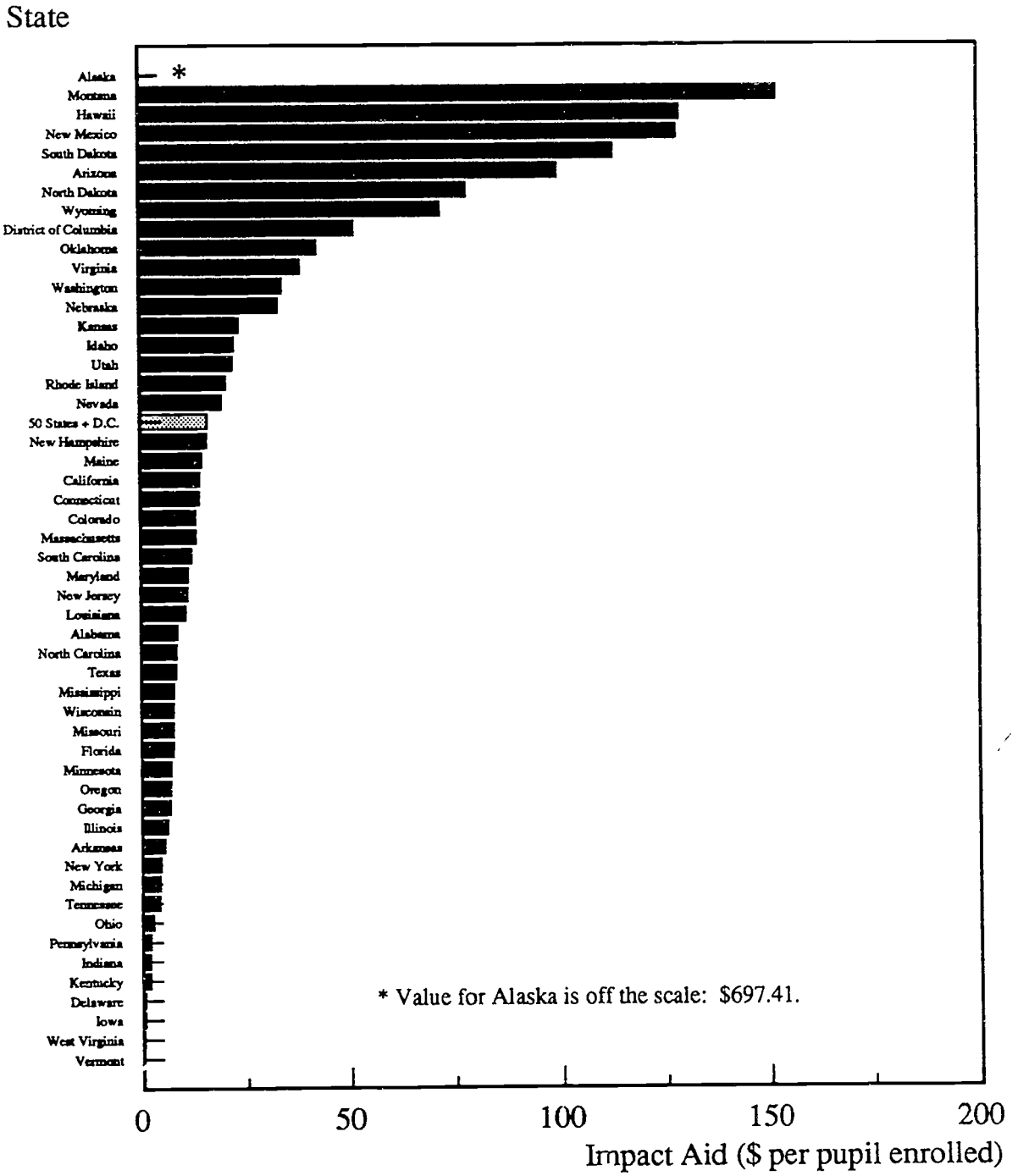
This highly skewed distribution arises out of the interaction between the two main factors in the Impact Aid formula: (1) the number of "federally related" pupils in each eligible

Table 19

Grants for Vocational Education: Aid per Secondary and Two-Year Postsecondary Enrollee and Per K-12 Enrollee, Fiscal Year 1989

State	Vocational Education Aid per Secondary + Postsecondary Enrollee		Vocational Education Aid per K-12 Enrollee		Secondary + Postsecondary Enrollment as a Percentage of K-12 Enrollment
	Amount ($)	As Percentage of U.S. Average	Amount ($)	As Percentage of U.S. Average	
Alabama	64.76	118.1	22.59	112.0	34.9
Alaska	116.91	213.2	38.70	191.8	33.1
Arizona	50.13	91.4	19.72	97.7	39.3
Arkansas	66.00	120.3	21.27	105.4	32.2
California	38.63	70.4	15.65	77.6	40.5
Colorado	50.58	92.2	18.08	89.6	35.7
Connecticut	51.25	93.5	17.74	88.0	34.6
Delaware	122.35	223.1	42.63	211.3	34.8
District of Columbia	174.78	318.7	48.60	240.9	27.8
Florida	54.51	99.4	20.18	100.1	37.0
Georgia	65.20	118.9	20.77	103.0	31.9
Hawaii	65.93	120.2	24.60	122.0	37.3
Idaho	58.76	107.1	19.20	95.2	32.7
Illinois	46.77	85.3	19.35	95.9	41.4
Indiana	61.41	112.0	20.99	104.0	34.2
Iowa	51.65	94.2	20.22	100.3	39.2
Kansas	50.99	93.0	17.98	89.1	35.3
Kentucky	68.40	124.7	23.43	116.1	34.3
Louisiana	80.68	147.1	22.58	111.9	28.0
Maine	61.99	113.0	20.56	101.9	33.2
Maryland	50.13	91.4	18.93	93.8	37.8
Massachusetts	54.79	99.9	21.04	104.3	38.4
Michigan	49.55	90.4	19.76	98.0	39.9
Minnesota	50.71	92.5	18.49	91.6	36.5
Mississippi	61.27	111.7	21.65	107.3	35.3
Missouri	60.19	109.7	20.92	103.7	34.8
Montana	87.27	159.1	27.08	134.2	31.0
Nebraska	55.27	100.8	19.69	97.6	35.6
Nevada	69.74	127.2	23.35	115.8	33.5
New Hampshire	71.03	129.5	24.32	120.6	34.3
New Jersey	48.37	88.2	18.20	90.2	37.6
New Mexico	54.24	98.9	20.22	100.2	37.3
New York	49.41	90.1	19.96	98.9	40.4
North Carolina	60.22	109.8	22.89	113.5	38.0
North Dakota	101.55	185.2	34.69	171.9	34.2
Ohio	56.17	102.4	20.71	102.7	36.9
Oklahoma	58.09	105.9	20.75	102.9	35.7
Oregon	51.01	93.0	19.47	96.5	38.2
Pennsylvania	57.32	104.5	23.23	115.1	40.5
Rhode Island	85.60	156.1	30.85	152.9	36.0
South Carolina	65.91	120.2	22.87	113.3	34.7
South Dakota	114.71	209.2	32.47	161.0	28.3
Tennessee	67.57	123.2	22.79	113.0	33.7
Texas	54.61	99.6	17.93	88.9	32.8
Utah	53.01	96.7	15.39	76.3	29.0
Vermont	131.90	240.5	44.09	218.6	33.4
Virginia	52.05	94.9	18.94	93.9	36.4
Washington	44.12	80.5	17.69	87.7	40.1
West Virginia	65.16	118.8	22.27	110.4	34.2
Wisconsin	53.06	96.7	21.10	104.6	39.8
Wyoming	108.85	198.5	42.14	208.9	38.7
50 States + D.C.	54.85	100.0	20.17	100.0	36.8

Figure 8
Interstate Variation in Per-Pupil Allocations of Impact Aid Grants Fiscal Year 1989



LEA and (2) the level of per-pupil expenditure that enters into the computation of the LEA's aid allotment.[24] The details cannot be spelled out here. A full analysis would have to be conducted with LEA-level data. Obviously, Alaska's extraordinarily high allocation per pupil reflects the conjunction of a high percentage of federally related pupils and a very high level of education outlay per pupil (note that the per-pupil expenditure factor in Impact Aid is not limited to a certain range around the national mean, as it is in the Chapter 1 formulas). That states such as New Mexico and South Dakota also receive large grants per pupil under Impact Aid indicates, however, that being a high-spending state is not a prerequisite for doing well under the formula. The number of federally related pupils is clearly the dominant factor, and it is determined primarily by the locations of military bases, Indian reservations, and other large aggregations of federal or federally supported activity.

Other Grant Programs

Briefer descriptions of the relationships between fund allocation methods and allocative outcomes under some of the smaller elementary-secondary grant programs follow:

Drug-Free Schools. The formula of the Drug-Free Schools program was mathematically identical to that of the Chapter 2 Block Grant program in FY 1989; hence, exactly the same explanation of its fund distribution pattern applies: allocations per K-12 enrollee vary moderately among the states because of differences in state enrollment rates and because of the previously discussed time-lag factor, and the smallest states receive sharply higher per-pupil allocations than the rest because of the 1/2 of 1 percent lower bound on each state's share.

Mathematics and Science. The formula for distributing funds under the Mathematics and Scienc ım is a blend of the formulas used to distribute Chapter 2 Block Grants and

Chapter 1 Grants to LEAs. Because of the Chapter 1 component, states like Alabama, Mississippi, New York, and New Jersey get larger relative shares of aid per pupil under this program than under the Chapter 2 Block Grant or Drug-Free Schools programs. In general, however, the distributions under all three programs are quite similar.

Migrant Education. The distribution of Migrant Education funds is dominated by the formula's need indicator, the number of eligible migratory children in a state, as reported through the previously mentioned MSRTS data system. These children are heavily concentrated in a few Sunbelt and West Coast states, notably California and Texas. The latter two states together receive 50 percent of the program's total funds. The same per-pupil expenditure factor as is used in the Chapter 1 Basic Grants formula appears in this formula also, but it has a relatively minor effect on the distribution because of the heavy concentration of eligible children in certain states.

Adult Education. The Adult Education formula distributes funds according to the number of persons in each state age 16 and older who do not have a high school diploma, as reported in the 1980 Census. Aid per K-12 enrollee in FY 1989 varies according to the ratio of that count to fall 1988 enrollment. In addition, the requirement that each state receive an initial fixed allotment of $250,000 before the remaining funds are apportioned according to the aforesaid person count sharply increases allocations to the same less-populous states that benefit from the lower-bound provisions of other formulas.

* * * * *

The foregoing examination of fund distribution patterns, in conjunction with the discussion of the current formulas in Chapter 2, establishes the framework for the analysis of alternative fund allocation methods in the final chapter of the report. Many such alternatives

have already been identified explicitly and others are implicit in the foregoing analyses of formula factors, formula designs, and the relationships of both to distributional outcomes. In Chapter 4, we consider in detail the rationales for, and designs of, selected alternatives, the effects of these alternatives on fund distribution patterns in general and on allotments to individual states, and the arguments for and against changing from current to alternative fund allocation methods.

Notes

1. The analysis is of allocations of funds appropriated in FY 1989; however, under the "forward funding" arrangements applicable to most ED elementary-secondary programs, funds appropriated in FY 1989 were provided for use during the 1989-90 school year.

2. As an extreme example of the potentially misleading character of obligations data, obligations for some of the largest states under the EHA Basic Grants program were reported as being at or near zero in FY 1989, not because these states received no aid but because the funds were awarded in the prior year and carried over to FY 1989.

3. It appeared at the beginning of the study that expenditure data would be available for analysis, because ED annually reports figures purporting to be expenditures by program and by state to the Census Bureau. These figures are then published in an annual Census Bureau report entitled *Federal Expenditures by State* (U.S. Bureau of the Census, various years). Upon inquiry within the Department, however, we learned that the figures reported to Census are not actual expenditure amounts but rather rough extrapolations based on (1) national totals of expenditure by program and (2) estimates of state percentage shares of expenditure under each program developed by a special study many years ago. These spurious expenditure figures are useless for analyzing fund distribution patterns, and no other compilations by program and by state were found to exist.

4. In some instances, the state-by-state tabulations of allocations obtained from the ED Budget Service are more detailed than those that appear in the official ED Budget Justification. In particular, the Budget Service material provides state-by-state breakdowns for the individual grant programs funded under Chapter 1, but the Budget Justification does not.

5. The "outlying areas," other than Puerto Rico, include American Samoa, Guam, the Virgin Islands, the Northern Mariana islands, and the Trust Territory of the Pacific. In addition, funds payable to the Bureau of Indian Affairs (BIA) on behalf of Indian children under certain programs are included with funds for the outlying areas under an "other" heading.

6. The most recent data on private K-12 enrollment by state in the *Digest of Education Statistics, 1990* (National Center for Education Statistics, 1991) are for the fall of 1980.

7. The two statistics cited are chosen from among the indicators displayed in Table 8 to give a concise summary of the degree of variation in aid among states. That the pupil-weighted coefficient of variation is .20 or less means that about two-thirds of all pupils are enrolled in states that receive within plus or minus 20 percent of the national average allocation per pupil. That the 95th-to-5th percentile range is 1.7 means that 90 percent of all pupils (all those above the 5th percentile and below the 95th percentile) are enrolled in school in states among which aid per pupil varies by no more than a ratio of 1.7 to 1.

8. That the EHA Preschool Grant program falls in this "medium variation" category is a temporary phenomenon, reflecting the transitional status of programs serving preschool handicapped children. As of FY 1989, some states provided special education services for all

or most such children, while some served very few. Once service for that age group (3-5) has become universal, the interstate variation in EHA Preschool Grants per pupil will probably be similar to that under the EHA Basic Grants program.

9. Both these correlation coefficients and the elasticity measures given below are pupil-weighted statistics--that is, each state is assigned a weight in the computation proportionate to its K-12 enrollment. This weighting procedure prevents the statistical indicators from being unduly influenced by aid allocations to small states, which, as the preceding discussion showed, are sometimes far above the U.S.-average allocation per pupil.

10. The elasticity measures cited here and later are derived from pupil-weighted regression equations in which the logarithm of federal aid per pupil is regressed on the logarithm of the state characteristic in question (in this case, total elementary-secondary revenue per pupil). When the regression equation is fitted in this log-log form, the estimated "slope" of aid per pupil with respect to the independent variable is, by definition, the elasticity of the former with respect to the latter.

11. The aid and revenue data used in this analysis have not been adjusted to reflect differences in the cost of education among states. Such adjustments would not alter the finding that states that raise more education revenue per pupil from their own sources also tend to receive more federal aid per pupil but could change the estimated correlation coefficients and elasticities.

12. Recall that although the per-pupil expenditure factor does not appear explicitly in the Mathematics and Science formula, it does affect aid allocations indirectly, because one factor that does appear in the formula, state allocations under the Chapter 1 Grants to LEAs program, is itself determined partly by state per-pupil expenditure.

13. Briefly, the principal shortcomings of per capita income as a fiscal capacity measure are that (1) it is not a sufficiently comprehensive indicator (it leaves out some important components of taxable income and wealth) and (2) it takes no account of states' abilities to collect tax revenues from residents of other states. The implications of these shortcomings are discussed more extensively in Chapter 4 and spelled out in full detail in Barro (1985, 1986).

14. The Education Department's recent annual reports on administration of the Education of the Handicapped Act do present state-reported figures on federal, state, and local funds expended for special education and related services; however, the lack of nationally uniform definitions and accounting standards for reporting such outlays makes the figures noncomparable among states. See, for example, U.S. Department of Education, Office of Special Education and Rehabilitative Services (1989).

15. Estimates of state-by-state poverty rates in the mid-1980s, based on Census Current Population Survey (CPS) data for multiple years, were obtained from Plotnick (1989).

16. The effects of enrollment growth or decline are accentuated by the practice of "forward funding" the ED grant programs. Because of forward funding, funds appropriated during the 1988-1989 fiscal year (that is, FY 1989) are for distribution to states and LEAs during the 1989-90 school year. Therefore, the funds available to be spent per 1989-90 pupil will be

based on state populations in 1987. A state that gained enrollment at an annual rate of, say, 2 percent over that 2-to-3-year period would end up with about 5 percent less Chapter 2 money per 1989-90 enrollee than a state whose enrollment remained constant. Similarly, a state that lost enrollment at a 2 percent annual rate over the same period would obtain about 5 percent more aid per 1989-90 K-12 enrollee.

17. These numerical findings derive from a comparison of actual allocations of Chapter 2 funds with allocations simulated on the basis of an unconstrained formula. The full results of these and many other simulations of alternative formulas are presented in Chapter 4.

18. According to the Education of the Handicapped Act, a state is eligible for Preschool Grants, beginning in FY 1990, only if it has instituted "policies and procedures that assure the availability under the State law and practice of such State of a free appropriate public education for all handicapped children aged three to five, inclusive." In years prior to FY 1990 (including FY 1989), states were eligible for such aid if they served some handicapped children ages 3-5, even if they did not offer services to all children in that age group.

19. According to the law, excess payments of EHA Preschool Grants generated by state overestimates of the number of children to be served are to be recouped by reducing aid payments in subsequent years.

20. That is, the pupil-weighted coefficient of variation in aid per pupil among states would be .166, which is 85 percent of the coefficient of variation of .196 under the existing formulas.

21. These findings are based on simulations of allocations under modified versions of the Vocational Education formula. The pupil-weighted coefficient of variation in aid per pupil among states falls from .180 under the actual formula to .115 when the constraints are deleted from the formula and to .097 when the per capita income factor is deleted as well.

22. According to an analysis conducted by the National Assessment of Vocational Education (Muraskin, 1989), 38 to 40 percent of aid under the Perkins Act was allocated to postsecondary institutions.

23. The essence of the problem is that being a "vocational education student" is a matter of degree rather than a clear-cut classification. Most secondary students take some courses that can be labeled "vocational." The only reasonable way to measure vocational enrollment therefore is by quantifying vocational course taking, but no data on course taking are now available by state.

24. The per-pupil expenditure figure used in computing Impact Aid for a particular LEA is not necessarily that of the LEA itself. Depending on how the level of spending in that LEA compares with spending by other LEAs, the figure may be the per-pupil expenditure of the LEA itself, the average per-pupil expenditure of "comparable" LEAs in the same state, the statewide average level of per-pupil spending, or even average per-pupil spending in the nation.

4. ALTERNATIVES TO THE EXISTING FUND ALLOCATION METHODS

The foregoing analyses of the current federal education aid formulas and fund distributions have set the stage for this chapter's assessment of alternative fund allocation methods. Many issues have already been raised about the adequacy of existing formula factors, the relevance of omitted factors, the reasonableness of formula mathematics, and other aspects of formula design. Implicit in all of them are possible changes in, or alternatives to, the current methods of distributing funds. This chapter presents and evaluates an array of such alternatives, shows how they would redistribute federal aid, and compares them with one another and with the existing allocative mechanisms.

This assessment of alternatives has multiple purposes. One is diagnostic: to establish how the interstate distributions are influenced by the presence of particular formula features and, hence, how the distributions would differ if those features were absent. A second purpose is to demonstrate possible solutions to problems identified in the earlier chapters--for example, to show how formulas might be altered to correct alleged inequities or to improve the match of funding to needs. A third purpose is to determine the effects of proposals for formula revision put forth by interested parties in the policy-making and research communities--not least among them, the alternatives cited in the Congressional mandate for this study. Finally, cutting across all the above is the general purpose of identifying and laying out for policymakers an array of suggestions for improving the existing set of fund allocation mechanisms.

The chapter is organized around a series of simulation exercises in which allocations of education aid to states are computed according to modified or alternative formulas and the resulting distributions are compared with the actual allocations and with one another. These simulations are accompanied, where necessary, with further examinations of formula design

problems and potential solutions. In particular, additional information is provided about the strengths and weaknesses of current and alternative indicators of fiscal capacity, fiscal effort, and education costs.

The specific alternatives examined in this chapter have been selected for diverse reasons:

- Certain alternatives derive from comparisons among the different federal elementary-secondary grant programs. For example, the fact that an adjustment for fiscal capacity (per capita income) appears only in the Vocational Education formula raises the questions of whether it should be retained in that formula and, if so, whether it should be incorporated into other formulas as well.

- Analyses of some alternatives are motivated by specific concerns about formula designs or distributional outcomes. For example, the finding that the Chapter 1 per-pupil expenditure factor is theoretically shaky but important in distributing $5 billion in federal aid raises the issue of whether that factor should be deleted or replaced.

- Some alternatives have been included to determine the effects of implementing general principles of formula design. Most notably, the alternative of distributing federal aid in an inverse relationship to state fiscal capacity is considered not only because of the Vocational Education precedent but also because adjustments for fiscal capacity figure so prominently in the scholarly literature on intergovernmental finance and fiscal federalism.

- A few alternatives are inspired by prototypes outside the federal education aid system. For instance, the practice of measuring fiscal capacity in per-pupil rather than per capita terms in state education aid formulas suggests the option of measuring fiscal capacity that way in the federal programs as well.

- Finally, one set of alternatives, those involving rewards for fiscal effort, is included not only because of the reasons already set forth but also because of Congress's stipulation in the mandate for this study that such options be examined.

Discussion of a particular alternative in this chapter does not necessarily imply that it is thought to be a suitable candidate for actual use or that it is being proposed or recommended as a substitute for an existing formula. Some alternatives are shown only to

demonstrate the effects of particular elements of funding mechanisms. For example, we analyze the effects of deleting the entire per capita income factor from the Vocational Education formula not because such a change has been deemed desirable but simply because we wish to quantify the influence of that adjustment factor on the interstate distribution of aid. Similarly, we demonstrate the effects of incorporating into the Chapter 1 formula a dubious proxy for the cost of education--a teacher salary index--not to endorse or encourage the use of such an index but simply to show the general magnitudes and directions of the changes likely to occur from inserting a cost factor into the formula.

By the same token, the omission of an alternative from this analysis in no way implies irrelevance or undesirability. Many more alternatives of potential policy interest can be formulated than can reasonably be examined individually, and so it has been necessary to deal with alternatives selectively. In several instances, we deal with generic alternatives (those potentially applicable to all or most education aid programs) by designating one or two programs as vehicles for illustrating their effects. For instance, we use the Chapter 2 Block Grant formula (chosen for its simplicity) to illustrate the effects of rewarding states for fiscal effort. Second, certain alternatives that are highly policy relevant or technically interesting cannot be analyzed empirically at this time because the necessary data do not exist. Among these, for example, are the options of allocating federal funds partly according to educational performance and rewarding states for the effort they exert to support particular educational programs. Moreover, two of the eleven elementary-secondary grant programs covered in earlier chapters are not dealt with at all in this analysis of alternatives. The Impact Aid program is excluded because changes in its formula have to be analyzed with detailed LEA-level data, which is beyond the scope of this study. The EHA Preschool program is omitted

because its transitional status as of FY 1989 (the requirement to serve all handicapped 3-to-5-year-olds was being phased in) makes comparisons of alternative fund distributions uninformative. The attention given to the remaining nine programs varies according to program size, with the greatest emphasis being placed on those with the highest levels of funding.

The analysis of alternatives is organized topically rather than by program. It deals, in sequence, with alternative treatments of poverty and poverty concentration factors, changes in other indicators of need, alternative methods of taking fiscal capacity into account in distributing aid, the option of rewarding states for fiscal effort to support education, different approaches to adjusting for education cost differentials among states, and, finally, changes in the constraints attached to the existing formulas.

POVERTY AND POVERTY CONCENTRATION AS INDICATORS OF NEEDS

The incidence of poverty, represented by the number of children in a state from families with incomes below the poverty line, is the single most important need indicator in the current array of federal elementary-secondary education aid formulas. It is the principal factor controlling the distribution of nearly $5.6 billion (as of FY 1991) in Chapter 1 funds (Basic Grants plus Concentration Grants) for the disadvantaged. In addition, it has recently become a major determinant of fund distributions (albeit by a slightly indirect route, as explained earlier) under both the Mathematics and Science and Drug-Free Schools programs ($202 million and $606 million, respectively, in FY 1991). Whether the poverty factor is satisfactory in its current form or whether it should be modified or replaced is therefore one of the most important issues of education grant formula design.

Issues concerning the poverty indicator in the Chapter 1 formula have been analyzed, debated, and fought over ever since the program's creation in 1965. Much attention has focused on how the incidence of poverty should be measured for the purpose of allocating aid--for instance, whether the present official "poverty line" is valid and whether the cutoff for Chapter 1 eligibility should be set at 100 percent or some other multiple (e.g., 125 percent) of the poverty threshold. The handicap of having to rely on 10- or 12-year-old Census poverty data has been discussed extensively, as have possible remedies ranging from special data collection to the use of alternative need indicators. There has also been considerable debate over the broader issue of whether the incidence of poverty should continue to be the sole need indicator governing the allocation of Chapter 1 funds or whether other arguably relevant factors, such as levels of educational achievement, also should influence the aid distribution.

Although this analysis touches on some of the aforementioned issues, it deals with them only in a highly selective rather than a comprehensive manner. Some important questions concerning the poverty indicator cannot be examined empirically for lack of essential data. It is not feasible, for instance, to analyze the effects of distributing Chapter 1 funds among states partly according to educational achievement because no suitable state-by-state achievement indicators have yet been produced.[1] The scope of this inquiry has also been limited to avoid duplicating previous research. For example, because Ginsburg, Noell, and Rosenthal (1985) have already analyzed (with 1980 Census data) the effects of changing the Chapter 1 poverty threshold from 100 percent to 125 or 150 percent of the poverty line, the same changes are not reexamined here.[2] Finally, analyses have been avoided that would be untimely in relation to the availability of decennial Census data. For instance, although it would be interesting to examine the effects of taking the severity as well as the prevalence of

poverty into account, doing so with the now-available 1980 Census data would yield instantly obsolete findings. It seems more reasonable to defer such inquiries until the 1990 Census data are released.

In light of these considerations, we have chosen to deal in this section with the following series of issues and alternatives:

1. The general effects of allocating Chapter 1 funds according to poverty, as compared with allocating them according to a "neutral" indicator, such as school-age population.

2. Methods of updating the Chapter 1 poverty counts (even if crudely) between the decennial Censuses.

3. The possibility of basing Chapter 1 allocations on counts of children eligible for free and reduced-price school lunches instead of on the Census poverty counts.

4. Alternative definitions of poverty concentration and changes in the importance accorded poverty concentration, as opposed to poverty incidence, in the Chapter 1 formula.

5. Present and potential roles of the poverty factor in programs other than Chapter 1.

The General Effects of Distributing Aid According to the Incidence of Poverty

It seems useful, as a prelude to considering alternatives to the current poverty factor, to review how that factor has shaped the distribution of Chapter 1 funds. This task is accomplished by comparing the actual interstate distribution, based on the 1980 Census poverty counts, with the distribution that would result from allocating funds according to a "neutral" indicator, population in the usual school-attending age range of 5 through 17 (hereafter referred to simply as "population 5-17"). The modified formula based on school-age population constitutes an "alternative" for the purpose of this analysis, but it should be

clear that it is considered here for diagnostic purposes only. No suggestion is intended that the option of replacing poverty incidence with population 5-17 actually merits consideration; rather, the intent is solely to demonstrate how strongly the poverty factor has influenced distribution of Chapter 1 funds among the states.

Table 20 compares the hypothetical distribution based on population 5-17 (column 1) with the actual allocations based on Census poverty counts (column 2). Absolute and percentage differences between the two are shown in columns 3 and 4, respectively. The percentage differences are also shown graphically in Figure 9, which arrays the states according to how they are affected by the poverty factor; those with the largest percentage gains are at the top and those with the largest percentage losses are at the bottom. The percentage changes depicted in this diagram can be interpreted as deviations from an untargeted distribution of Chapter 1 funds. (Note, however, that both sets of allocations in Table 20 reflect the effects of the per-pupil expenditure factor--the so-called cost adjustment--in the Chapter 1 formula. Retaining the expenditure factor in the formula is necessary to isolate the effects of the poverty indicator.)

From the percentage-change column of Table 20, it can be seen how substantially the poverty-based distribution deviates from a distribution based on the general school-age population. Seventeen states plus the District of Columbia and Puerto Rico receive more aid under the poverty-based formula than they would have received if allocations were based on population 5-17 (leaving the per-pupil expenditure factor in place), while 32 states receive less. The differences between the two sets of allocations are striking. Mississippi receives 88 percent more under the current formula than under the population-based alternative; the District of Columbia receives 64 percent more; and eight low-income states (all in the South

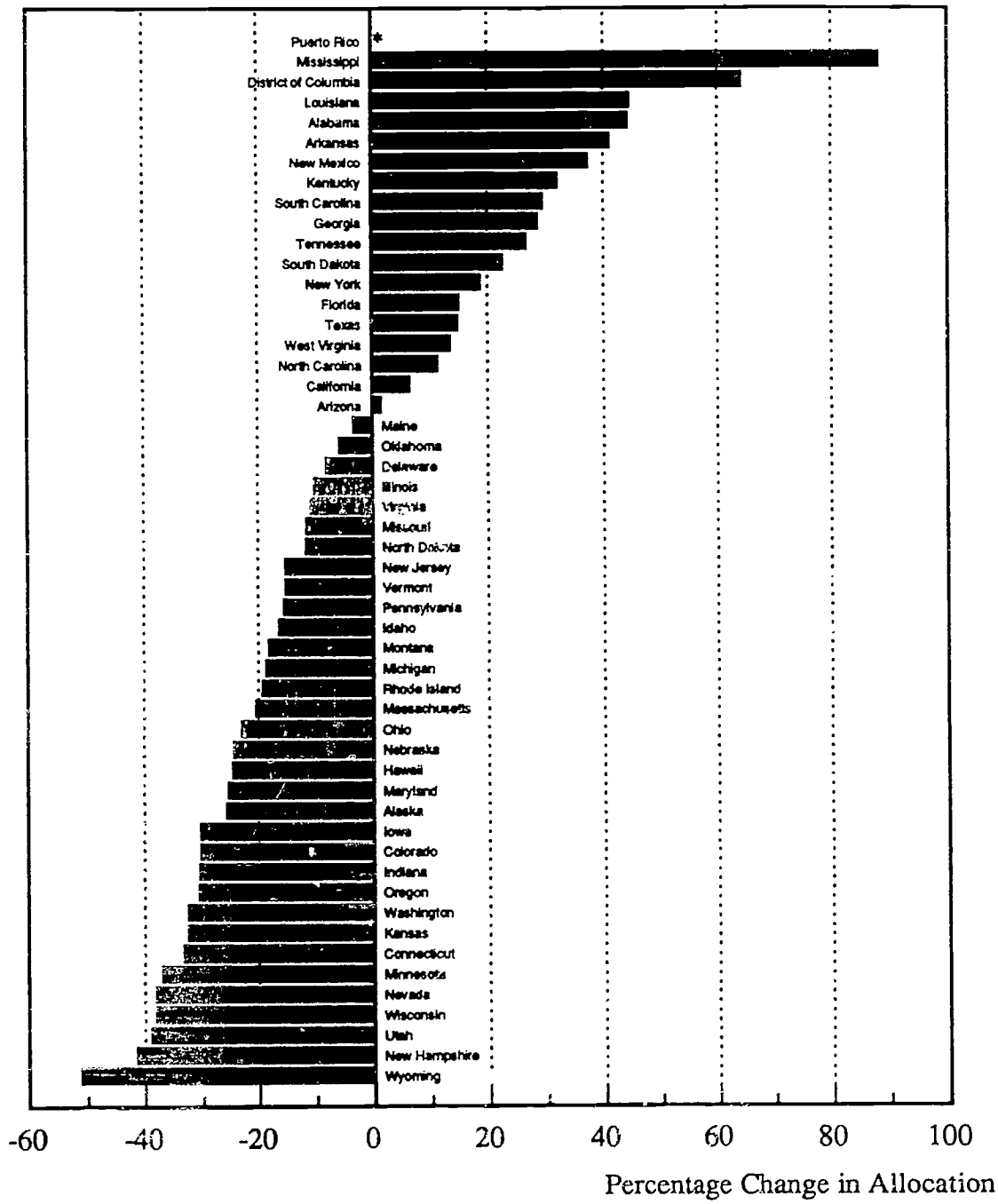
Table 20

Effects of Distributing Chapter 1 Basic Grant Funds According to Numbers of Poor Children Rather than According to School-Age Population, Fiscal Year 1989 (Allocations in thousands of dollars)

State	Allocation According to School-Age Population	Allocation According to Poverty Count (Actual FY 1989 Allocation)	Difference	Percentage Change
Alabama	56,346	81,242	24897	44.2
Alaska	8,795	6,546	-2250	-25.6
Arizona	41,454	42,116	662	1.6
Arkansas	32,129	45,346	13217	41.1
California	352,298	375,414	23116	6.6
Colorado	50,382	35,237	-15145	-30.1
Connecticut	62,166	41,540	-20627	-33.2
Delaware	12,165	11,194	-972	-8.0
District of Columbia	10,484	17,220	6736	64.3
Florida	138,780	159,574	20794	15.0
Georgia	84,446	108,587	24141	28.6
Hawaii	15,269	11,535	-3734	-24.5
Idaho	13,770	11,529	-2240	-16.3
Illinois	201,171	180,860	-20312	-10.1
Indiana	87,372	60,888	-26485	-30.3
Iowa	47,364	33,128	-14236	-30.1
Kansas	37,765	25,524	-12241	-32.4
Kentucky	51,634	68,151	16517	32.0
Louisiana	62,779	90,798	28019	44.6
Maine	18,997	18,391	-606	-3.2
Maryland	86,697	64,860	-21837	-25.2
Massachusetts	112,538	89,574	-22964	-20.4
Michigan	182,608	148,843	-33764	-18.5
Minnesota	74,441	46,980	-27462	-36.9
Mississippi	38,988	73,384	34397	88.2
Missouri	71,530	63,326	-8204	-11.5
Montana	14,319	11,729	-2589	-18.1
Nebraska	24,933	18,877	-6056	-24.3
Nevada	11,516	7,139	-4377	-38.0
New Hampshire	15,718	9,205	-6513	-41.4
New Jersey	149,317	126,636	-22681	-15.2
New Mexico	21,720	29,820	8100	37.3
New York	345,295	410,218	64923	18.8
North Carolina	81,382	90,559	9177	11.3
North Dakota	9,596	8,481	-1115	-11.6
Ohio	172,612	133,318	-39294	-22.8
Oklahoma	40,120	37,846	-2274	-5.7
Oregon	45,955	31,976	-13979	-30.4
Pennsylvania	223,344	188,756	-34588	-15.5
Rhode Island	18,178	14,691	-3487	-19.2
South Carolina	46,143	59,767	13624	29.5
South Dakota	9,569	11,731	2162	22.6
Tennessee	63,048	79,848	16800	26.6
Texas	216,625	248,600	31975	14.8
Utah	22,551	13,809	-8742	-38.8
Vermont	9,729	8,246	-1483	-15.2
Virginia	86,079	76,869	-9210	-10.7
Washington	66,802	45,166	-21636	-32.4
West Virginia	31,929	36,233	4304	13.5
Wisconsin	94,131	58,335	-35796	-38.0
Wyoming	9,736	4,766	-4970	-51.0
Puerto Rico	32,334	140,642	108308	335.0
United States	3,815,050	3,815,050	0	0.0

Figure 9

Percentage Differences Between the Actual Poverty-Based Allocations of Chapter 1 Funds and "Neutral" Allocations Based on School-Age Population



* Value for Puerto Rico is off the scale: 335%

but New Mexico) each receive between 25 and 45 percent more aid than would have been coming to them according to a population-based distribution. Significantly, however, New York and California are gainers as well; in fact, New York reaps the largest benefits, measured in absolute dollars, from the presence of the poverty factor. On the other side of the ledger, each of 15 states receives at least 25 percent less aid than it would have received if the number of children ages 5-17 rather than the number below the poverty line had been taken as the indicator of need. It is fair to say, therefore, that the current interstate distribution of Chapter 1 funds is decisively shaped by the poverty factor. This poverty-based, distinctly nonneutral distribution of aid provides the baseline against which alternative Chapter 1 formulas are compared throughout the remainder of this discussion.

Substitutes for Updated Poverty Counts

An important, almost universally acknowledged, shortcoming of the current Chapter 1 Basic Grant formula is that the poverty counts on which it relies can be more than a decade out of date. Today, Chapter 1 grants are being distributed mainly according to data on 1979 patterns of poverty collected by the 1980 decennial Census. It will probably be sometime in 1992 or 1993 before these data can be replaced with new figures from the 1990 Census. Taking into account that the Chapter 1 funds appropriated in a given fiscal year are used to support programs in the following fiscal (school) year, it is likely that funding for federal compensatory education programs in the 1993-94 school year will still be distributed mainly according to the distribution of low-income pupils in 1979. More important, unless something is changed, the practice of using increasingly outdated poverty figures will begin all over again in the next decade as the 1990 Census data begin to age.

There is little doubt that a distribution of FY 1989 Chapter 1 funds based on recent poverty data would differ considerably from the actual distribution based on the 1980 Census data, but the degree will remain unknown until the 1990 Census poverty figures are released. As a rough indication of the magnitudes of changes likely to be encountered, consider the findings of Ginsburg, Noell, and Rosenthal (1985) pertaining to changes in state poverty counts between the 1970 and 1980 Censuses. According to that study, many states' shares of children in the below-poverty category shifted upward or downward by 20 to 40 percent during the 1970s. Consequently, Chapter 1 allocations in 1980 deviated by comparable percentages from what they would have been if up-to-date poverty data (i.e., data for 1980 rather than 1970) had been available.

Until the 1990 Census data are ready, no county-level alternative to the 1980 set of poverty numbers will be available. At the state level, however, there are two approaches to consider to alleviating the problem that the Census poverty counts are badly out of date. One is to base the Chapter 1 allocations on each state's percentage of low-income children rather than its absolute number of low-income children in 1979, thereby replacing the present implicit assumption that the absolute number of poor children in each state has remained constant since 1979 with the alternative assumption that the percentage of poor children in each state has remained fixed during that period. The second option is to update the allocations on the basis of state-level estimates of numbers of poor children in years later than 1979. Specifically, this updating could be accomplished on the basis of a special set of estimates of child poverty in the mid-1980s prepared by the Children's Defense Fund (CDF). The rationales for, and effects of, these options are considered in the subsection that follows. (The option of switching from Census poverty counts to counts of children eligible for free or

reduced-price school lunches, which would also deal with the problem of outdated poverty data, is discussed separately later.)

Allocating According to Percentages Rather than Absolute Numbers of Low-Income Children. The rationale for this alternative is that assuming a constant percentage of low-income children in each state, although undoubtedly incorrect, is probably less bad than assuming constant absolute numbers of low-income children. The latter assumption is untenable in the face of data showing widely varying rates of change among states in the size of the school-age (5-17) population. Under the percentage-based alternative, the formula count of poor children in each state would be scaled up or down each year in proportion to the state's rate of growth or decline in the 5-17 population stratum.[3]

The effects of switching from the constant-number-of-poor assumption to the constant-percentage-of-poor assumption are shown in Table 21. The general effect, of course, would be to shift funds from states with slow-growing or declining populations to states whose populations are growing at above-average rates. Utah and Alaska would gain the most in percentage terms from the change (26 and 24 percent, respectively), but Texas and California would gain the largest absolute amounts ($31.3 and $26.6 million, respectively). The principal losers would be the major industrial states of the Northeast and Midwest; for instance, Massachusetts's allocation would fall by 10.5 percent, Pennsylvania's by 6.8 percent, and New York's by 5.1 percent. The overall redistributive effect would be relatively moderate (at least in comparison with other options considered later in this chapter).

Because annual data on population 5-17 are available only for states and not for counties, this alternative would have no direct effect on the intercounty distribution of Chapter 1 funds within each state. The intercounty allocations could be handled by raising or lowering

Table 21

Effects of Assuming Constant Poverty Percentages Instead of Constant Poverty Numbers in the Chapter 1 Basic Grant Formula
Fiscal Year, 1989
(Allocations in thousands of dollars)

State	Actual Allocation	Allocation Assuming Constant Percentages	Difference	Percentage Change
Alabama	81,242	80,120	-1122	-1.4
Alaska	6,546	8,129	1583	24.2
Arizona	42,116	46,535	4420	10.5
Arkansas	45,346	45,399	54	0.1
California	375,414	401,991	26577	7.1
Colorado	35,237	37,252	2015	5.7
Connecticut	41,540	38,057	-3482	-8.4
Delaware	11,194	10,739	-454	-4.1
District of Columbia	17,220	15,151	-2069	-12.0
Florida	159,574	168,137	8563	5.4
Georgia	108,587	113,203	4616	4.3
Hawaii	11,535	11,991	456	4.0
Idaho	11,529	12,707	1177	10.2
Illinois	180,860	173,363	-7497	-4.2
Indiana	60,888	58,471	-2417	-4.0
Iowa	33,128	31,821	-1308	-4.0
Kansas	25,524	25,872	348	1.4
Kentucky	68,151	67,486	-665	-1.0
Louisiana	90,798	92,644	1845	2.0
Maine	18,391	17,793	-598	-3.3
Maryland	64,860	60,643	-4217	-6.5
Massachusetts	89,574	80,170	-9404	-10.5
Michigan	148,843	139,156	-9687	-6.5
Minnesota	46,980	45,167	-1813	-3.9
Mississippi	73,384	74,643	1259	1.7
Missouri	63,326	62,005	-1321	-2.1
Montana	11,729	12,106	377	3.2
Nebraska	18,877	18,563	-314	-1.7
Nevada	7,139	7,791	653	9.1
New Hampshire	9,205	9,121	-84	-0.9
New Jersey	126,636	117,133	-9504	-7.5
New Mexico	29,820	31,536	1716	5.8
New York	410,218	389,307	-20911	-5.1
North Carolina	90,559	90,414	-145	-0.2
North Dakota	8,481	8,648	167	2.0
Ohio	133,318	127,282	-6035	-4.5
Oklahoma	37,846	40,334	2487	6.6
Oregon	31,976	32,234	258	0.8
Pennsylvania	188,756	175,881	-12875	-6.8
Rhode Island	14,691	13,690	-1001	-6.8
South Carolina	59,767	60,446	679	1.1
South Dakota	11,731	11,461	-270	-2.3
Tennessee	79,848	79,614	-234	-0.3
Texas	248,600	279,890	31290	12.6
Utah	13,809	17,461	3651	26.4
Vermont	8,246	7,983	-263	-3.2
Virginia	76,869	74,921	-1949	-2.5
Washington	45,166	46,749	1584	3.5
West Virginia	36,233	35,671	-562	-1.6
Wisconsin	58,335	55,693	-2642	-4.5
Wyoming	4,766	5,279	513	10.8
Puerto Rico	140,642	147,197	6555	4.7
United States	3,815,050	3,815,050	0	0.0

the allocation to every county in a state by the same percentage as that for the state as a whole. Alternatively, provision could be made for basing the county-level allocations on data from other, state-specific sources. For instance, states might be allowed or required to reallocate funds among counties according to state data on child population or enrollment. The substate allocation issue is separable from the interstate issue, however, and is not pursued further here.[4]

Allocating According to Child Poverty Estimates for the Mid-1980s. The second alternative, allocating Chapter 1 funds among states according to estimated numbers of low-income children in each state in the mid-1980s, is feasible because of the Children's Defense Fund's efforts to develop such estimates. The estimates of child poverty (Children's Defense Fund, 1990) were constructed using data from the Census Bureau's Current Population Survey (CPS). Because the annual CPS surveys have sample sizes too small to yield estimates of child poverty by state, the CDF combined CPS data from five successive years to produce its results. This is why they are referred to as mid-1980s estimates rather than as figures for any particular year.

Table 22 compares the CDF's estimates of mid-1980s poverty percentages with the percentages based on the 1980 Census. The CDF numbers are higher for almost every state--sometimes substantially so. What counts for the formula allocation process, however, is the relative number rather than the absolute number of poor children in each state. Here, too, the CDF figures present a picture very different picture from the Census estimates, as can be seen from the ratios in the last column of the table. The variability of these ratios signifies that the CDF numbers do not vary among states in the same proportions as the Census figures and

Table 22

Child Poverty Rates According to the 1980 Census Poverty Counts and the Children's Defense Fund's Mid-1980s Poverty Estimates

State	Percentage of Children from Families Below the Poverty Line According to: 1980 Census	CDF Mid-1980s Estimates	Ratio of CDF to Census Figures
Alabama	23.5	31.7	1.35
Alaska	12.1	12.7	1.05
Arizona	16.5	21.2	1.28
Arkansas	23.0	29.0	1.26
California	17.3	21.4	1.24
Colorado	11.4	16.2	1.42
Connecticut	10.9	11.8	1.08
Delaware	15.0	15.3	1.02
District of Columbia	26.7	31.3	1.17
Florida	18.7	21.1	1.13
Georgia	20.9	24.2	1.16
Hawaii	12.3	16.7	1.36
Idaho	13.6	21.7	1.60
Illinois	14.6	22.8	1.56
Indiana	11.3	18.4	1.63
Iowa	11.4	21.3	1.87
Kansas	11.0	14.5	1.32
Kentucky	21.5	23.6	1.10
Louisiana	23.5	30.6	1.30
Maine	15.8	16.0	1.01
Maryland	12.2	13.0	1.07
Massachusetts	12.9	14.1	1.09
Michigan	13.3	22.7	1.71
Minnesota	10.3	16.3	1.58
Mississippi	30.6	34.3	1.12
Missouri	14.4	20.5	1.42
Montana	13.3	20.1	1.51
Nebraska	12.3	18.7	1.52
Nevada	10.1	15.2	1.50
New Hampshire	9.5	6.2	0.65
New Jersey	13.8	15.5	1.12
New Mexico	22.3	27.5	1.23
New York	19.3	23.6	1.22
North Carolina	18.1	19.5	1.08
North Dakota	14.4	16.4	1.14
Ohio	12.6	20.2	1.60
Oklahoma	15.3	21.0	1.37
Oregon	11.3	17.7	1.57
Pennsylvania	13.8	18.4	1.33
Rhode Island	13.1	16.7	1.27
South Carolina	21.1	23.5	1.11
South Dakota	19.9	21.3	1.07
Tennessee	20.6	25.2	1.22
Texas	18.7	23.3	1.25
Utah	10.0	13.2	1.32
Vermont	13.8	16.1	1.17
Virginia	14.5	14.9	1.03
Washington	11.0	16.9	1.54
West Virginia	18.5	30.4	1.64
Wisconsin	10.1	15.8	1.56
Wyoming	7.9	15.5	1.96
Puerto Rico	70.8	NA	--

ensures that aid allocations based on the CDF estimates will differ substantially from those under the existing Chapter 1 formula.

Substitution of the mid-1980s poverty estimates for the older 1980 Census figures would be an attractive option if the estimates were known to be reasonably reliable, but the quality of the CDF/CPS estimates is unknown and suspect. Estimates for the less-populous states, in particular, are apparently based on too few observations to yield estimates with acceptably small standard errors.[5] Also, aggregating five years' worth of CPS data is a questionable procedure, because child poverty rates in the states undoubtedly fluctuated over that period. Nevertheless, it is likely that, at least for the larger states, the CDF/CPS estimates are closer to true current child poverty rates than are the decennial Census data for 1979. Thus it is of interest to see how the distribution of funds would be affected if these estimates were substituted for the present poverty counts.

Table 23 shows how the FY 1989 Chapter 1 distribution would be altered by building into the formula the assumption that each state's poverty percentage is that implied by the CDF/CPS estimates rather than that indicated by the Census poverty counts.[6] Clearly, some of the changes are substantial. According to the CDF numbers, Idaho, Iowa, Utah, and Wyoming would receive aid increases ranging from 33 to 66 percent; 15 more states would receive increases in excess of 10 percent; and another 15 states would receive from 10 percent to 17 percent less aid than under the current formula. The general pattern of redistribution, albeit with a few notable exceptions, would be away from northeastern and some southeastern states and toward the states of the Midwest and West.

It is difficult to assess this approach to updating the poverty figures because of doubts about the validity of the CDF estimates. Before long, however, we will be able to learn from

Table 23

Effects of Substituting the Children's Defense Fund's Mid-1980s Poverty Rates for 1980 Census Rates in the Chapter 1 Basic Grant Formula
Fiscal Year 1989
(Allocations in thousands of dollars)

State	Actual Allocation	Allocation Based on CDF Rates	Difference	Percentage Change
Alabama	81,242	85,683	4440	5.5
Alaska	6,546	6,544	-2	0.0
Arizona	42,116	46,186	4070	9.7
Arkansas	45,346	45,666	320	0.7
California	375,414	335,254	-40160	-10.7
Colorado	35,237	40,433	5196	14.8
Connecticut	41,340	35,558	-5982	-14.4
Delaware	11,194	9,311	-1882	-16.8
District of Columbia	17,220	14,496	-2724	-15.8
Florida	159,574	149,658	-9916	-6.2
Georgia	108,587	103,193	-5394	-5.0
Hawaii	11,535	12,470	935	8.1
Idaho	11,529	16,021	4492	39.0
Illinois	180,860	209,695	28836	15.9
Indiana	60,888	73,865	12977	21.3
Iowa	33,128	45,301	12173	36.7
Kansas	25,524	26,620	1096	4.3
Kentucky	68,151	59,045	-9105	-13.4
Louisiana	90,798	95,250	4452	4.9
Maine	18,391	15,350	-3041	-16.5
Maryland	64,860	55,968	-8892	-13.7
Massachusetts	89,574	76,671	-12903	-14.4
Michigan	148,843	178,641	29798	20.0
Minnesota	46,980	52,843	5863	12.5
Mississippi	73,384	66,739	-6645	-9.1
Missouri	63,326	68,991	5665	9.0
Montana	11,729	14,053	2324	19.8
Nebraska	18,877	21,224	2347	12.4
Nevada	7,139	8,869	1730	24.2
New Hampshire	9,205	7,773	-1432	-15.6
New Jersey	126,636	107,713	-18923	-14.9
New Mexico	29,820	30,379	559	1.9
New York	410,218	352,551	-57667	-14.1
North Carolina	90,559	78,036	-12523	-13.8
North Dakota	8,481	7,774	-707	-8.3
Ohio	133,318	159,292	25974	19.5
Oklahoma	37,846	43,688	5842	15.4
Oregon	31,976	38,538	6562	20.5
Pennsylvania	188,756	181,636	-7120	-3.8
Rhode Island	14,691	13,372	-1319	-9.0
South Carolina	59,767	53,167	-6600	-11.0
South Dakota	11,731	9,695	-2036	-17.4
Tennessee	79,848	76,672	-3176	-4.0
Texas	248,600	278,139	29539	11.9
Utah	13,809	18,332	4522	32.8
Vermont	8,246	7,464	-782	-9.5
Virginia	76,869	65,163	-11707	-15.2
Washington	45,166	54,213	9048	20.0
West Virginia	36,233	46,586	10353	28.6
Wisconsin	58,335	66,741	8406	14.4
Wyoming	4,766	7,886	3119	65.5
Puerto Rico	140,642	140,642	0	0.0
United States	3,815,050	3,815,050	0	0.0

the 1990 Census poverty data whether the CDF figures are reasonably consistent with changes in state poverty rates during the 1980s. A positive answer would lend significant encouragement to future efforts to update poverty figures, using the CPS or other limited-scale data sources, between the decennial Censuses.

Allocating According to Counts of Children Eligible for Free and Reduced-Price School Lunch Rather than According to Census Poverty Counts

A number of interested parties, including some members of Congress, have raised the issue of whether it would be desirable to base Chapter 1 allocations on counts of children eligible for free and reduced-price school lunches instead of on the decennial Census poverty counts. The number of children eligible for the subsidized lunch programs is arguably a reasonable proxy for the incidence of poverty because eligibility is based on family income.[7] States are required under the school lunch program to report the numbers of their pupils who apply to participate and who are certified as satisfying the income criteria. Unlike the Census poverty counts, moreover, the numbers of children eligible for federally subsidized school lunches are determined annually. Switching to the counts of children eligible for free and reduced-price lunches would make it possible, therefore, to distribute Chapter 1 funds according to relatively current data rather than according to data from the decennial Censuses.

A comparison of the interstate distributions of current Chapter 1 eligibles and children eligible for free and reduced-price lunches reveals some substantial differences. Table 24 presents FY 1989 figures on the numbers of children now counted as eligible for Chapter 1, the numbers eligible for free school lunches, and the numbers eligible for free *or* reduced-price lunches. The left-hand portion of the table shows the absolute numbers; the right-hand portion shows each state's share of the corresponding national total. Note that states like

Table 24

Numbers of Children Eligible for Chapter 1 and for Free or Reduced-Price School Lunches by State, Fiscal Year 1989

State	Number of Eligibles			Percentage of U.S. Total		
	Chapter 1 Poverty Count	Free Lunch	Free and Reduced-Price Lunch	Chapter 1 Poverty Count	Free Lunch	Free and Reduced-Price Lunch
Alabama	200,585	267,881	316,168	2.48	2.41	2.37
Alaska	11,004	15,762	20,384	0.14	0.14	0.15
Arizona	92,292	159,015	193,767	1.14	1.43	1.45
Arkansas	111,839	140,949	166,671	1.38	1.27	1.25
California	781,190	1,370,298	1,604,227	9.66	12.30	12.01
Colorado	66,136	111,917	150,886	0.82	1.01	1.13
Connecticut	68,417	65,056	82,062	0.85	0.58	0.61
Delaware	18,508	18,144	22,201	0.23	0.16	0.17
District of Columbia	28,673	40,457	46,526	0.36	0.36	0.35
Florida	334,989	479,646	582,684	4.14	4.31	4.36
Georgia	253,238	318,885	394,737	3.13	2.86	2.96
Hawaii	23,286	40,286	54,687	0.29	0.36	0.41
Idaho	28,430	42,062	57,406	0.35	0.38	0.43
Illinois	345,492	489,542	556,399	4.27	4.40	4.17
Indiana	133,481	176,402	210,620	1.65	1.58	1.58
Iowa	67,844	87,537	114,227	0.84	0.79	0.86
Kansas	50,394	82,373	110,833	0.62	0.74	0.83
Kentucky	168,235	214,936	256,570	2.08	1.93	1.92
Louisiana	223,987	389,820	446,637	2.77	3.50	3.34
Maine	37,330	37,929	51,685	0.46	0.34	0.39
Maryland	106,743	124,264	157,737	1.32	1.12	1.18
Massachusetts	146,471	133,875	163,716	1.81	1.20	1.23
Michigan	269,067	338,883	396,740	3.33	3.04	2.97
Minnesota	87,120	123,870	166,562	1.08	1.11	1.25
Mississippi	181,115	265,793	305,947	2.24	2.39	2.29
Missouri	142,198	193,296	239,137	1.76	1.74	1.79
Montana	21,839	31,557	40,449	0.27	0.28	0.30
Nebraska	39,246	49,642	69,876	0.49	0.45	0.52
Nevada	15,108	20,668	26,157	0.19	0.19	0.20
New Hampshire	18,207	12,544	18,351	0.23	0.11	0.14
New Jersey	208,459	209,387	255,343	2.58	1.88	1.91
New Mexico	66,211	114,905	137,236	0.82	1.03	1.03
New York	669,891	834,709	1,002,905	8.29	7.50	7.51
North Carolina	223,003	280,904	360,200	2.76	2.52	2.70
North Dakota	19,341	23,401	31,188	0.24	0.21	0.23
Ohio	285,308	382,058	451,912	3.53	3.43	3.38
Oklahoma	93,507	157,281	198,236	1.16	1.41	1.48
Oregon	57,650	92,193	116,477	0.71	0.83	0.87
Pennsylvania	320,412	305,206	384,306	3.96	2.74	2.88
Rhode Island	24,251	24,757	30,528	0.30	0.22	0.23
South Carolina	145,775	202,436	247,829	1.80	1.82	1.86
South Dakota	28,755	36,578	48,914	0.36	0.33	0.37
Tennessee	196,920	242,496	287,329	2.44	2.18	2.15
Texas	574,717	1,087,481	1,254,046	7.11	9.76	9.39
Utah	34,135	56,229	83,928	0.42	0.51	0.63
Vermont	15,102	12,706	17,005	0.19	0.11	0.13
Virginia	158,687	178,018	217,201	1.96	1.60	1.63
Washington	91,998	142,678	179,692	1.14	1.28	1.35
West Virginia	75,016	110,835	132,891	0.93	1.00	1.00
Wisconsin	100,606	145,097	180,846	1.24	1.30	1.35
Wyoming	8,048	13,808	19,084	0.10	0.12	0.14
Puerto Rico	614,967	640,759	694,497	7.61	5.75	5.20
United States	8,085,223	11,137,208	13,355,642	100.00	100.00	100.00

Arizona, California, Texas, and Utah have considerably larger percentages of the nation's children eligible for free and reduced-price lunches than they do of the nation's Chapter 1 eligibles, while states like Connecticut, Delaware, Massachusetts, New Jersey, and Pennsylvania exhibit the reverse pattern. Thus switching to a formula factor based on eligibility for the lunch program would increase the Chapter 1 allocations of the former (mainly western) states, while reducing the allocations of the latter (mainly northeastern) states.

Because of differences in the geographical distributions of the two target groups, substantial reallocations of aid would occur if the present Chapter 1 poverty counts were replaced by counts of children eligible for federally subsidized lunches. The pattern of gains and losses is shown in Table 25 and, graphically, in Figure 10.[8] The figure shows clearly that if funds were given out according to counts of children eligible for free lunches, the allocations of 10 states would increase by at least 20 percent, while the allocations of 9 states plus Puerto Rico would fall by at least 20 percent. The state with the largest relative loss, New Hampshire, would see its Chapter 1 funding cut nearly in half, and Pennsylvania and Massachusetts would lose 38 and 33 percent of their funds, respectively. The biggest gainers, both absolutely and relatively, would be California and Texas, with increases of 28 and 38 percent. Eight of the 10 largest gainers would be western states (the others being Oklahoma and Louisiana). All the New England states and most states in the mid-Atlantic region would suffer losses in the 10 to 20 percent range.

If funds were given out according to the combined counts of those eligible for both free lunches and reduced-price lunches, the general pattern would be the same, but some changes in the individual state allocations would be even more striking. As shown in Table

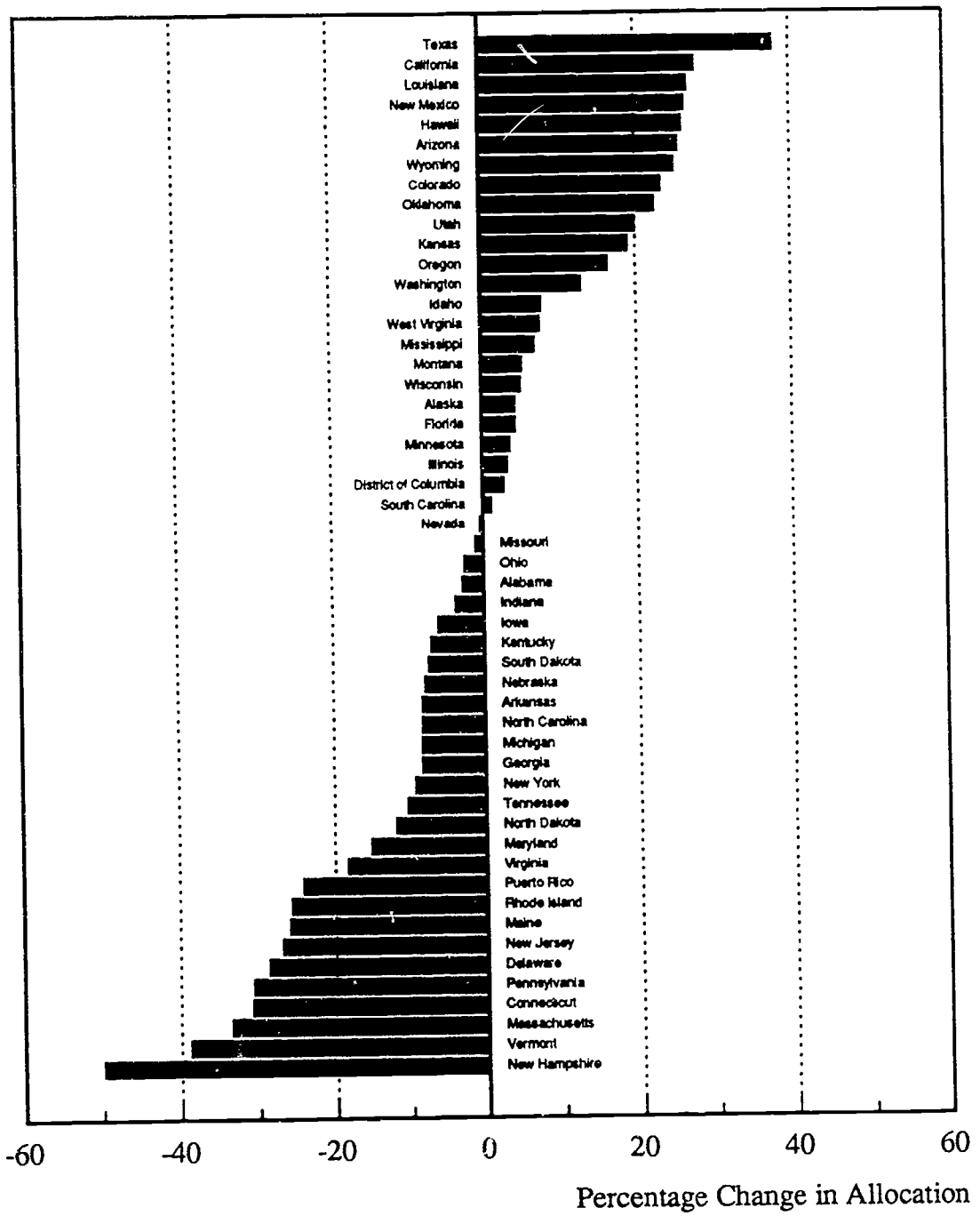
Table 25

Effects of Allocating Chapter 1 Funds According to Counts of Children Eligible for Free or Reduced-Price Lunches Instead of According to Poverty Counts, Fiscal Year 1989
(Allocations in thousands of dollars)

State	Actual Allocation (Based on Poverty Counts)	Allocation According to Counts of Children Eligible for Free Lunches			Allocation According to Counts of Children Eligible for Free or Reduced-Price Lunches		
		Amount	Change From Actual	Percentage Change	Amount	Change From Actual	Percentage Change
Alabama	82,240	80,011	-2229	-2.7	78,423	-3817	-4.6
Alaska	6,767	7,062	294	4.4	7,584	817	12.1
Arizona	42,168	52,927	10759	25.5	53,560	11392	27.0
Arkansas	45,854	42,099	-3755	-8.2	41,341	-4513	-9.8
California	375,850	480,281	104431	27.8	466,942	91092	24.2
Colorado	35,742	44,062	8320	23.3	49,333	13590	38.0
Connecticut	42,077	29,147	-12930	-30.7	30,532	-11544	-27.4
Delaware	11,382	8,129	-3254	-28.6	8,260	-3122	-27.4
District of Columbia	17,634	18,126	492	2.8	17,311	-323	-1.8
Florida	163,655	170,704	7048	4.3	172,215	8560	5.2
Georgia	109,635	100,572	-9063	-8.3	103,388	-6248	-5.7
Hawaii	11,410	14,380	2970	26.0	16,211	4801	42.1
Idaho	11,656	12,563	907	7.8	14,239	2583	22.2
Illinois	182,417	188,296	5878	3.2	177,727	-4690	-2.6
Indiana	61,517	59,225	-2292	-3.7	58,724	-2793	-4.5
Iowa	33,513	31,500	-2013	-6.0	34,136	623	1.9
Kansas	25,727	30,635	4908	19.1	34,231	8504	33.1
Kentucky	68,977	64,197	-4779	-6.9	63,640	-5337	-7.7
Louisiana	91,835	116,432	24597	26.8	110,785	18950	20.6
Maine	18,549	13,729	-4819	-26.0	15,537	-3012	-16.2
Maryland	65,647	55,673	-9974	-15.2	58,688	-6959	-10.6
Massachusetts	90,080	59,979	-30101	-33.4	60,913	-29167	-32.4
Michigan	150,330	137,930	-12400	-8.3	134,101	-16229	-10.8
Minnesota	47,314	49,007	1693	3.6	54,725	7411	15.7
Mississippi	74,258	79,388	5130	6.9	75,888	1630	2.2
Missouri	63,934	63,312	-622	-1.0	65,047	1113	1.7
Montana	11,846	12,470	624	5.3	13,274	1428	12.1
Nebraska	19,049	17,552	-1496	-7.9	20,518	1469	7.7
Nevada	7,037	7,013	-24	-0.3	7,370	334	4.7
New Hampshire	9,247	4,641	-4606	-49.8	5,638	-3608	-39.0
New Jersey	128,203	93,810	-34393	-26.8	95,004	-33199	-25.9
New Mexico	30,129	38,090	7961	26.4	37,780	7651	25.4
New York	411,985	373,968	-38017	-9.2	373,144	-38841	-9.4
North Carolina	91,432	83,901	-7531	-8.2	89,345	-2087	-2.3
North Dakota	8,560	7,545	-1015	-11.9	8,351	-209	-2.5
Ohio	134,776	131,477	-3299	-2.5	129,149	-5627	-4.2
Oklahoma	38,338	46,977	8639	22.5	49,171	10833	28.3
Oregon	32,362	37,702	5339	16.5	39,557	7194	22.2
Pennsylvania	190,556	132,229	-58326	-30.6	138,270	-52285	-27.4
Rhode Island	14,914	11,092	-3823	-25.6	11,358	-3556	-23.8
South Carolina	60,447	61,151	704	1.2	62,171	1723	2.9
South Dakota	11,790	10,925	-864	-7.3	12,133	343	2.9
Tennessee	80,738	72,429	-8309	-10.3	71,270	-9468	-11.7
Texas	251,325	346,438	95113	37.8	331,768	80443	32.0
Utah	13,995	16,795	2799	20.0	20,818	6822	48.8
Vermont	8,526	5,225	-3300	-38.7	5,808	-2718	-31.9
Virginia	77,819	63,596	-14223	-18.3	64,438	-13380	-17.2
Washington	47,101	53,214	6114	13.0	55,656	8556	18.2
West Virginia	36,549	39,339	2790	7.6	39,170	2621	7.2
Wisconsin	59,087	62,079	2993	5.1	64,256	5169	8.8
Wyoming	4,950	6,186	1237	25.0	7,100	2151	43.5
Puerto Rico	142,271	107,990	-34282	-24.1	97,202	-45069	-31.7
United States	3,853,200	3,853,200	0	0.0	3,853,200	0	0.0

Figure 10

Changes in Allocations as a Result of Distributing Chapter 1 Funds According to Free-Lunch Counts Instead of Poverty Counts



25, three states, Hawaii, Wyoming, and Utah, would enjoy funding increases of 42, 43, and 49 percent, respectively; 13 states would gain more than 20 percent, while 8 states plus Puerto Rico would lose 20 percent or more of their Chapter 1 allocations. These, clearly, are not mere adjustments but major changes in the interstate distribution.

Is switching to the school lunch counts a reasonable idea? From one perspective, the choice between the Census poverty factor and the school lunch alternatives appears to hinge on a trade-off between a direct poverty measure available only decennially and less direct, probably less accurate, "proxy" measures of poverty, the school lunch counts, available annually. The more closely the lunch counts correlate with counts of low-income children, the less loss would be incurred by switching to the lunch-eligibility proxy. At this point, we cannot determine how strong this correlation is because Census poverty counts are available only for 1980, while usable school lunch data are available for only the past few years.[9] When the 1990 Census poverty figures become available, however, we should be able to determine definitively how closely the distribution of school lunch eligibles approximates that of children below the specified poverty thresholds.

Apart from the trade-off between validity and timeliness, however, there are also two other important points to consider. One is that using the school lunch indicators in the formula would mean shifting to a looser poverty standard. The present income threshold for Chapter 1 eligibility, 100 percent of the official poverty line, would be superseded by a new threshold of either 130 percent or 185 percent of the poverty line, depending on whether only free-lunch eligibles or both free-lunch and reduced-price-lunch eligibles were counted. Thus, a by-product of the switch in indicators would be an allocation system less well targeted on the below-poverty population.

The second point--and perhaps the critical one--is that, unlike the Census poverty counts, which are objective and externally determined, the school lunch counts are influenced by the policies and practices of state and local educational agencies. One channel of influence is that state and local officials administer the processes whereby children (or their families) apply to, and are certified as eligible for, the school lunch programs. Other things being equal, states that actively encourage applications or are lenient in determining eligibility are likely to end up with relatively larger counts of eligible children. An even more basic mode of influence is that state and local officials decide whether any lunches, subsidized or not, are provided in school (i.e., whether schools have food service facilities). Obviously, variations in this regard could affect the distribution of children eligible for the federal programs. The significance of state and local influence is that it may reduce the degree to which school lunch eligibility correlates with, and serves as a proxy for, the incidence of poverty. Interstate differences in policies are extraneous factors that have little to do with needs and, in principle, should not affect allocations of federal aid. Moreover, the fact that numbers of school lunch eligibles can be influenced by state and local policies implies that they might also be subject to manipulation. Making the size of a state's Chapter 1 grant contingent on the number of school lunch eligibles the state reports could create incentives for officials to alter, and perhaps distort, the process of determining eligibility for the purpose of generating additional federal funds. The likelihood of such distortion would have to be considered in connection with any decision to base allocations on the school lunch data.

Poverty Concentration Versus Poverty Incidence

Chapter 1 Grants to LEAs are now distributed according to a two-part formula based on two different poverty indicators. The first part allocates aid (Basic Grants) according to

the number of low-income children in each state. The second part allocates aid according to the concentration of low-income children in each state, or, more precisely, according to whether and by how much the numbers of low-income children in each state exceed specified absolute and percentage thresholds. As of FY 1990, the fraction of Chapter 1 funds distributed according to poverty concentration was 8.3 percent of the total, having risen from only 4.3 percent in FY 1989. However, this fraction, the Concentration Grant share, can reasonably be treated as a formula parameter subject to change. Whether this parameter should again be changed--in particular, whether it should be increased further--is an important formula design issue.

Apart from the balance between Basic Grants and Concentration grants, there are issues concerning the Concentration Grant formula itself. The current statute establishes dual criteria for determining eligibility for Concentration Grants. A county receives such funds if the number of its Chapter 1 eligibles exceeds either 15 percent of its population 5-17 (the percentage criterion) or 6,500 children (the absolute criterion), but the method of calculating the size of the county's Concentration Grant depends on which criterion is satisfied. A county qualifying only under the 6,500 criterion receives aid in proportion to the number of its Chapter 1 eligibles *in excess of* that threshold, but a county qualifying under the 15 percent criterion receives aid in proportion to the *total* number of its Chapter 1 eligibles (*not* just the number in excess of 15 percent). This formulation raises several design questions and suggests the following series of alternatives:

1. Shifting from the present dual criteria to a single criterion of poverty concentration;

2. Allocating concentration grants according to the degree to which a recipient's count of eligibles *exceeds* the applicable threshold, regardless of which threshold applies; and

3. Changing the percentage threshold, the absolute threshold, or both.

These alternatives are examined next; then the effects of shifting funds between the Basic Grant and Concentration Grant formulas are considered.

Effects of Changes in the Concentration Grant Formula. The general rationale for having Concentration Grants is that the educational problems and costs associated with educational disadvantage increase *more than in proportion* to the number of disadvantaged pupils to be served in a school or school system. Schools with 50, 70, or 90 percent poor or otherwise disadvantaged pupils are said to face educational problems qualitatively different, not just different in degree, from those faced by schools with 10 or 15 percent disadvantaged. However, this proposition offers little guidance as to the appropriate quantitative relationship between funding and degree of concentration: How rapidly should aid increase in relation to the number of disadvantaged, and is it the absolute number or the proportion of disadvantaged that counts?

On its face, the case for focusing on the proportion of low-income or disadvantaged children seems stronger. If 5,000 pupils in a county with 10,000 total enrollees were from below-poverty households, most observers would say that the county is heavily poverty-impacted and needs extra resources to cope with the attendant educational problems. But the same 5,000 poor students spread over the schools of a county with 50,000 pupils would elicit a different reaction--if anything, the county's light burden of disadvantagedness might be noted. The issue is obscured, however, by the need to work with county-level data, when the educationally relevant concentration phenomena are at the district and school-building levels.

Referring to the previous example, what might seem to be a relatively low rate of disadvantagedness--5,000 out of 50,000 pupils--could still constitute a serious educational problem if most of the 5,000 attended only a handful of the county's schools. Ideally, it might be best to define the criteria of eligibility for Concentration Grants in terms of building-level concentrations (e.g., numbers of poor pupils in a county attending schools where 25 percent or more of the enrollees are poor), but the effects of that option cannot be examined with existing data. For the moment, all that can be done is to investigate the effects of changes in the county-level variables that control the distribution of Concentration Grants.

Table 26 shows the effects of three alternatives involving changes in the roles of the absolute and percentage thresholds: (1) allocating funds among counties according to the percentage threshold only, (2) allocating according to the absolute threshold only, and (3) allocating according to both thresholds but only in proportion to numbers of eligible pupils *in excess of* whichever threshold applies. The results show that all three changes would affect the distribution of Concentration Grant funds substantially--which is to say that each element of the present two-criterion formula plays a significant role in shaping the distribution of Concentration Grant funds.

The first two sets of results in Table 26 show what would happen if concentration grants were distributed according only to the percentage of low-income children (the 15 percent criterion) or according only to the absolute number of low-income children (the 6,500 criterion) but not according to the combination of the two. Under the percentage-threshold-only option (which reflects the view that only the *relative* concentration of disadvantaged children is educationally relevant), a few states--notably, Connecticut, Indiana, Massachusetts, Ohio, and Washington--would lose large fractions of their Concentration Grant funds. These

Table 26

Sensitivity of Chapter 1 Concentration Grant Allocations to the Form of the Concentration Grant Formula, Fiscal Year 1989
(Allocations in thousands of dollars)

State	Actual Concentration Grant Allocation (Thresholds: 15 Percent or 6,500)	Effects of Allocating Only According to the Percentage (15 Percent) Threshold		Effects of Allocating Only According to the Absolute (6,500) Threshold		Effects of Allocating According to Excess Over 15 Percent	
		Amount	Percentage Change	Amount	Percentage Change	Amount	Percentage Change
Alabama	4,905	5,607	14.3	1,676	-65.8	3,258	-33.6
Alaska	340	340	0.0	340	0.0	340	0.0
Arizona	2,355	1,678	-28.8	2,002	-15.0	2,230	-5.3
Arkansas	2,596	2,968	14.3	340	-86.9	1,577	-39.3
California	20,843	21,632	3.8	28,940	38.8	24,656	18.3
Colorado	1,128	1,233	9.3	559	-50.4	663	-41.2
Connecticut	1,359	340	-75.0	2,321	70.8	1,941	42.8
Delaware	446	340	-23.7	340	-23.7	432	-3.0
District of Columbia	1,056	1,208	14.3	1,395	32.1	1,167	10.5
Florida	8,544	8,738	2.3	7,605	-11.0	7,669	-10.2
Georgia	5,627	6,251	11.1	1,989	-64.7	4,011	-28.7
Hawaii	432	340	-21.3	608	40.6	508	17.6
Idaho	432	432	0.0	340	-21.3	432	0.0
Illinois	7,965	9,105	14.3	11,961	50.2	10,152	27.5
Indiana	976	340	-65.2	1,300	33.2	1,136	16.4
Iowa	545	623	14.3	340	-37.7	432	-20.7
Kansas	525	524	-0.1	340	-35.2	432	-17.6
Kentucky	3,707	4,237	14.3	648	-82.5	2,469	-33.4
Louisiana	4,947	5,484	10.9	2,526	-48.9	3,843	-22.3
Maine	570	652	14.3	340	-40.4	432	-24.2
Maryland	2,297	2,382	3.7	3,153	37.3	2,665	16.0
Massachusetts	3,644	2,033	-44.2	5,388	47.9	4,506	23.7
Michigan	5,750	5,712	-0.7	7,207	25.4	6,253	8.8
Minnesota	1,248	1,056	-15.4	553	-55.6	770	-38.2
Mississippi	4,307	4,924	14.3	436	-89.9	3,349	-22.3
Missouri	2,614	2,513	-3.9	1,736	-33.6	2,082	-20.3
Montana	390	390	0.0	340	-12.9	390	0.0
Nebraska	519	456	-12.2	340	-34.5	432	-16.7
Nevada	340	340	0.0	340	0.0	340	0.0
New Hampshire	340	340	0.0	340	0.0	340	0.0
New Jersey	5,477	5,593	2.1	6,723	22.8	5,776	5.5
New Mexico	1,825	2,086	14.3	407	-77.7	1,137	-37.7
New York	20,082	19,411	-3.3	30,316	51.0	25,582	27.4
North Carolina	3,862	4,166	7.9	675	-82.5	2,193	-43.2
North Dakota	402	402	0.0	340	-15.5	402	0.0
Ohio	4,090	2,584	-36.8	5,154	26.0	4,536	10.9
Oklahoma	1,534	1,415	-7.7	505	-67.0	998	-34.9
Oregon	432	340	-21.3	340	-21.3	432	0.0
Pennsylvania	5,822	5,069	-12.9	7,980	37.1	6,879	18.2
Rhode Island	637	728	14.3	673	5.7	563	-11.6
South Carolina	3,052	3,430	12.4	608	-80.1	1,801	-41.0
South Dakota	517	591	14.3	340	-34.2	432	-16.4
Tennessee	4,550	5,202	14.3	2,340	-48.6	3,077	-32.4
Texas	12,725	11,030	-13.3	11,820	-7.1	12,351	-2.9
Utah	432	340	-21.3	340	-21.3	432	0.0
Vermont	340	340	0.0	340	0.0	340	0.0
Virginia	3,188	3,614	13.4	567	-82.2	1,559	-51.1
Washington	1,119	600	-46.4	1,047	-6.5	989	-11.6
West Virginia	1,720	1,966	14.3	340	-80.2	731	-57.5
Wisconsin	1,375	1,572	14.3	1,379	0.3	1,248	-9.3
Wyoming	340	340	0.0	340	0.0	340	0.0
Puerto Rico	8,628	9,863	14.3	14,583	69.0	12,194	41.3
United States	172,900	172,900	0.0	172,900	0.0	172,900	0.0

states are the main beneficiaries from the absolute criterion (6,500 eligibles or more) in the current formula. Much of their Concentration Grant money is earned not by having high percentages of poor pupils but by having large enough aggregations of such pupils in populous counties to qualify under the "in excess of 6,500" rule.

In comparison, if funds were allocated only according to numbers of eligibles in excess of 6,500, the distribution would be far more radically altered. Southern and midwestern states would lose major portions of their aid--some in excess of 80 percent--and concentration grants would flow in far greater proportions than at present to the major urban centers. The reason is simply that most states have few counties with large enough populations to produce 6,500 or more below-poverty pupils. These results demonstrate that although different sets of states benefit from the two criteria in the current formula, the two do not have symmetrical or equally important effects. The percentage criterion is dominant in shaping the distribution, while the absolute criterion, though significant, plays what is clearly a supplemental, aid-spreading role.

The third alternative represented in Table 26 (in the last two columns) is to retain the dual criteria but to modify the formula so that funds are allocated according to numbers of eligible children *in excess of* whichever threshold applies. (Recall that under the existing formula, counties that qualify under the 15 percent threshold receive funds based on their total numbers of eligibles, not just the numbers in excess of 15 percent.) The general effect of this change is to diminish the importance of the percentage criterion relative to that of the absolute criterion, shifting funds in the same direction that they would be shifted by eliminating the 15 percent criterion entirely, but not to the same degree. In addition, some funds would shift away from counties whose child poverty rates are above but relatively close to the 15 percent

threshold toward counties whose poverty rates substantially exceed 15 percent. The beneficiaries, it turns out, would be primarily in the more urbanized, industrial states. California, Connecticut, Hawaii, Illinois, Indiana, Maryland, Massachusetts, New York, and Pennsylvania would all enjoy aid increases of 15 percent or more under this alternative, while most states in the South and some in the West and Midwest would sustain large losses. No fewer than a dozen such states would see their Concentration Grant funds decrease by at least 30 percent. The motive that would logically lead to support for this alternative is a desire to target aid more strongly to centers of urban poverty.

Effects of Changes in the Concentration Grant Thresholds. The present thresholds of eligibility for Concentration Grants, 15 percent or 6,500 eligible low-income children, produce what may reasonably be termed a mild to moderate degree of concentration. An overall indicator of the strength of the concentration effect is that of the 8.1 million children counted as eligibles for the purpose of allocating Chapter 1 Basic Grants, 6.1 million live in counties that also receive funds under the Concentration Grant formula. Based on this statistic, one can say that the present degree of concentration is 25 percent, in the sense that funds are spread over counties containing 25 percent fewer pupils under the Concentration Grant formula than under the Basic Grant formula. Lower thresholds (e.g., 10 percent or 5,000 eligibles) would reduce the degree of concentration still further, making the distribution of Concentration Grant funds increasingly similar to the distribution of Basic Grants. Higher settings (e.g., 25 percent or 15,000 eligibles) would increase the degree of concentration, focusing the aid distribution more tightly on places with more intense poverty-related problems.

Table 27 shows how many of the children eligible for Basic Grants would be found to live in counties qualifying for Concentration Grants if the percentage threshold of eligibility were set at various levels and if only the percentage criterion were in effect. As can be seen, the threshold would have to be increased to about 20 percent to limit eligibility to counties containing only 50 percent of all low-income pupils and to almost 30 percent to focus aid on counties containing only 25 percent of all Chapter 1 eligibles.[10]

Table 27

Degree of Concentration with Various Settings of the Percentage Threshold

	Eligible Children in Qualifying Counties	
Threshold (percent)	Number	Percentage of Basic-Grant Eligibles
0	8,085,223	100.0
5	8,030,996	99.3
10	7,282,811	90.1
15	5,370,056	66.4
20	4,017,090	49.7
25	2,606,468	32.2
30	1,756,531	21.7

A more detailed picture of the strength and pattern of the concentration effect can be obtained by comparing state shares of federal aid under the Concentration Grant and Basic Grant formulas. As can be seen from Table 28, the states that gain the most from Concentration Grants receive shares of aid under that program that are 30 to 35 percent larger than their shares of Basic Grant funds. The principal beneficiaries are southern states, but the

Table 28

State Shares of Federal Aid Under the Chapter 1
Basic Grant and Concentration Grant Formulas, Fiscal Year 1989

State	State Allocation as Percentage of Total Federal Funds	
	Basic Grants	Concentration Grants
Alabama	2.13	2.84
Alaska	0.17	0.20
Arizona	1.10	1.36
Arkansas	1.19	1.50
California	9.84	12.06
Colorado	0.92	0.65
Connecticut	1.09	0.79
Delaware	0.29	0.26
District of Columbia	0.45	0.61
Florida	4.18	4.94
Georgia	2.85	3.25
Hawaii	0.30	0.25
Idaho	0.30	0.25
Illinois	4.74	4.61
Indiana	1.60	0.56
Iowa	0.87	0.32
Kansas	0.67	0.30
Kentucky	1.79	2.14
Louisiana	2.38	2.86
Maine	0.48	0.33
Maryland	1.70	1.33
Massachusetts	2.35	2.11
Michigan	3.90	3.33
Minnesota	1.23	0.72
Mississippi	1.92	2.49
Missouri	1.66	1.51
Montana	0.31	0.23
Nebraska	0.49	0.30
Nevada	0.19	0.20
New Hampshire	0.24	0.20
New Jersey	3.32	3.17
New Mexico	0.78	1.06
New York	10.75	11.61
North Carolina	2.37	2.23
North Dakota	0.22	0.23
Ohio	3.49	2.37
Oklahoma	0.99	0.89
Oregon	0.84	0.25
Pennsylvania	4.95	3.37
Rhode Island	0.39	0.37
South Carolina	1.57	1.77
South Dakota	0.31	0.30
Tennessee	2.09	2.63
Texas	6.52	7.36
Utah	0.36	0.25
Vermont	0.22	0.20
Virginia	2.01	1.84
Washington	1.18	0.65
West Virginia	0.95	0.99
Wisconsin	1.53	0.80
Wyoming	0.12	0.20
Puerto Rico	3.69	4.99
United States	100.00	100.00

gainers also include western states such as California, New Mexico, Arizona, and Wyoming. At the other end of the scale, Indiana, Iowa, Kansas, and Oregon receive shares of Concentration Grant funds that are only 30 to 35 percent as large as their shares of Basic Grants. Another 12 or 15 states, some in the Midwest, some in the West, and some in New England, also do substantially worse under the Concentration Grant formula. Most urban, northeastern states generally receive slightly smaller shares of Concentration Grants than Basic Grants (although Pennsylvania receives sharply less), but New York actually gains from the Concentration Grant distribution.

These national and state-level indicators of the degree of concentration mask some of the stronger effects occurring at the county level. As mentioned earlier, counties containing 25 percent of all Chapter 1 eligibles face the ultimate reduction in their shares of aid: they get no funds at all under the Concentration Grant formula. Roughly speaking, the fractions of the pie that would have gone to those counties under the Basic Grant formula are transferred to counties with worse poverty-related problems, thereby producing the concentration effect.

Of course, there is no objective way to say what degree of concentration is "right." Explicitly or implicitly, that determination must rest on a value judgment regarding the trade-off between depth and breadth of federal aid. Is it better to pour large amounts of aid into the most counties most severely affected by poverty at the expense of counties whose problems, though serious, are less overwhelming, or is only a moderate tilt toward the more heavily burdened places more appropriate? To assist in making such judgments, we can show what the interstate distribution of Concentration Grants would look like and how it would differ from the current distribution under various threshold settings. Table 29 presents three such alternatives, corresponding, respectively, to threshold combinations of (1) 25 percent or 6,500

Table 29

Effects of Selected Changes in the Threshold Settings of the Concentration Grant Formula, Fiscal Year 1989 (Allocations in thousands of dollars)

State	Base-Case Allocation (Thresholds = 15 Percent or 6,500)	Allocation with Thresholds Set at 25 Percent or 6,500			Allocation with Thresholds Set at 35 Percent or 6,500			Allocation with Thresholds Set at 15 Percent or 15,000		
		Allocation	Difference	Percentage Change	Allocation	Difference	Percentage Change	Allocation	Difference	Percentage Change
Alabama	4,905	3,401	-1504	-30.7	2,828	-2077	-42.3	5,327	418	8.6
Alaska	340	340	0	0.0	340	0	0.0	340	0.0	0.0
Arizona	2,355	2,068	-287	-12.2	2,087	-269	-11.4	2,299	-56.2	-2.4
Arkansas	2,596	2,027	-569	-21.9	1,065	-1531	-59.0	2,820	223.3	8.6
California	20,843	23,689	2845	13.7	26,145	5302	25.4	21,629	786.2	3.8
Colorado	1,128	625	-502	-44.5	577	-551	-48.9	1,171	43.6	3.9
Connecticut	1,359	1,788	429	31.6	2,097	738	54.3	444	-914.4	-67.3
Delaware	446	432	-13	-3.0	432	-13	-3.0	432	-13.3	-3.0
District of Columbia	1,056	1,390	334	31.6	1,261	204	19.3	1,147	90.9	8.6
Florida	8,544	7,191	-1353	-15.8	7,212	-1333	-15.6	8,503	-41.6	-0.5
Georgia	5,627	4,922	-705	-12.5	2,993	-2634	-46.8	5,938	311.1	5.5
Hawaii	432	468	36	8.3	549	117	27.0	432	0.0	0.0
Idaho	432	432	0	0.0	432	0	0.0	432	0.0	0.0
Illinois	7,965	9,561	1596	20.0	10,891	2926	36.7	8,650	685.0	8.6
Indiana	976	1,001	25	2.6	1,174	198	20.3	543	-433.5	-44.4
Iowa	545	432	-113	-20.7	432	-113	-20.7	592	46.9	8.6
Kansas	525	432	-93	-17.6	432	-93	-17.6	498	-26.9	-5.1
Kentucky	3,707	3,352	-355	-9.6	1,962	-1745	-47.1	4,026	318.8	8.6
Louisiana	4,947	4,565	-381	-7.7	3,173	-1773	-35.8	5,210	263.1	5.3
Maine	570	432	-138	-24.2	432	-138	-24.2	620	49.1	8.6
Maryland	2,297	2,748	450	19.6	2,848	551	24.0	2,263	-34.6	-1.5
Massachusetts	3,644	4,473	829	22.7	4,868	1224	33.6	2,354	-1289.9	-35.4
Michigan	5,750	5,576	-174	-3.0	6,511	761	13.2	5,426	-323.4	-5.6
Minnesota	1,248	466	-781	-62.6	500	-748	-59.9	1,003	-244.5	-19.6
Mississippi	4,307	4,644	337	7.8	3,504	-803	-18.7	4,678	370.4	8.6
Missouri	2,614	2,247	-367	-14.1	1,839	-775	-29.7	2,433	-180.8	-6.9
Montana	390	390	0	0.0	390	0	0.0	390	0.0	0.0
Nebraska	519	432	-87	-16.7	432	-87	-16.7	433	-86.1	-16.6
Nevada	340	340	0	0.0	340	0	0.0	340	0.0	0.0
New Hampshire	340	340	0	0.0	340	0	0.0	340	0.0	0.0
New Jersey	5,477	5,816	339	6.2	6,074	597	10.9	5,314	-163.4	-3.0
New Mexico	1,825	1,495	-330	-18.1	811	-1014	-55.6	1,982	157.0	8.6
New York	20,082	24,306	4224	21.0	28,506	8424	41.9	19,747	-334.9	-1.7
North Carolina	3,862	2,610	-1252	-32.4	1,064	-2798	-72.4	3,958	95.4	2.5
North Dakota	402	402	0	0.0	402	0	0.0	402	0.0	0.0
Ohio	4,090	4,081	-9	-0.2	4,656	566	13.8	3,129	-961.0	-23.5
Oklahoma	1,534	958	-575	-37.5	502	-1032	-67.3	1,344	-189.4	-12.4
Oregon	432	432	0	0.0	432	0	0.0	432	0.0	0.0
Pennsylvania	5,822	6,456	634	10.9	7,209	1387	23.8	5,506	-316.2	-5.4
Rhode Island	637	519	-118	-18.6	608	-29	-4.5	692	54.8	8.6
South Carolina	3,052	2,341	-712	-23.3	1,167	-1885	-61.8	3,258	206.3	6.8
South Dakota	517	510	-6	-1.3	432	-84	-16.3	561	44.4	8.6
Tennessee	4,550	3,106	-1445	-31.8	2,555	-1996	-43.9	4,942	391.4	8.6
Texas	12,725	12,653	-72	-0.6	12,831	105	0.8	12,951	225.9	1.8
Utah	432	432	0	0.0	432	0	0.0	432	0.0	0.0
Vermont	340	340	0	0.0	340	0	0.0	340	0.0	0.0
Virginia	3,188	2,001	-1187	-37.2	512	-2676	-83.9	3,434	245.6	7.7
Washington	1,119	806	-313	-27.9	946	-173	-15.5	690	-429.1	-38.3
West Virginia	1,720	659	-1061	-61.7	432	-1287	-74.9	1,868	147.9	8.6
Wisconsin	1,375	1,075	-301	-21.9	1,246	-130	-9.4	1,494	118.3	8.6
Wyoming	340	340	0	0.0	340	0	0.0	340	0.0	0.0
Puerto Rico	8,628	11,354	2725	31.6	13,315	4687	54.3	9,370	742.1	8.6
United States	172,900	172,900	0	0.0	172,900	0	0.0	172,900	0.0	0.0

children; (2) 35 percent or 6,500 children; and (3) 15 percent or 15,000 children. The first two of these illustrate the effects of increasing in the percentage threshold, and the third illustrates the effect of setting a harder-to-meet absolute criterion.[11]

Raising the percentage threshold from 15 percent to 25 or 35 percent would tilt the distribution of Concentration Grant funds more steeply toward counties with large fractions of families below the poverty line. Larger shares of aid would flow to populous, more urbanized, mainly northeastern states. Specifically, more money would go to states such as California, Illinois, Massachusetts, and New York (as well as to Puerto Rico) and less to most southern, many western, and some midwestern states. The shift to a 25 percent threshold would reduce the Concentration Grants of 13 states by at least 20 percent. The further increase to a 35 percent threshold would raise to 17 the number of states with losses of at least 20 percent, of which eight states would receive less than half as much aid as under the current formula. Thus a policy of increasing the concentration of aid at the county level would also produce a more concentrated distribution among the states.

The alternative of increasing the absolute threshold from 6,500 to 15,000 (the last set of results shown in Table 29) has more limited effects. The states most adversely affected would be the same seven or eight that would be hurt the most by entirely deleting the absolute concentration criterion (see the earlier discussion of that option). These are states that earn relatively small shares of aid under the percentage criterion and do not have large enough counties to do well when the absolute threshold is raised. The gains from increasing the absolute threshold would be spread widely, and most states would be only minimally affected.

Tension between the desire to direct funds to where problems are the most severe and the contrary desire to disperse federal aid widely is inherent in debates over all federal grant formulas, but the conflict is rarely as clear-cut as in the case of Chapter 1 Concentration Grants. There is little point to having separate Concentration Grants unless they live up to their name, but they are not very concentrated now, and to concentrate them more would entail reducing the shares of many--in fact, a majority--of states. The issue of how much concentration is enough did not come to the fore when Concentration Grants were small, but their recent rapid growth is likely to make the topic increasingly prominent.

Changes in the Concentration Grant Share of Total Chapter 1 Funds. Only about one-twelfth of Chapter 1 Grants to LEAs were distributed (as of FY 1990) under the Concentration Grant part of the Chapter 1 formula. An increase in this fraction would direct more aid to states with relatively dense concentrations of eligible poor children and less aid to states with relatively thin concentrations of such children. The amount of redistribution would depend, of course, not only on the Concentration Grant share of the total Chapter 1 pie but also on how strongly the Concentration Grant formula itself favors places with high poverty percentages. The latter is determined, as has already been shown, by the settings of the formula parameters--in particular, the percentage threshold. We consider here what the effects of increasing the Concentration Grant share of total Chapter 1 funds would be under each of two conditions: (1) leaving the Concentration Grant formula itself unchanged and (2) resetting the thresholds to increase the degree of concentration substantially.

Specifically, Table 30 shows the combined distributions of Basic Grant and Concentration Grant funds ($3.99 billion in FY 1989) according to four alternative formulas. Under the first two, the concentration thresholds remain at 15 percent and 6,500, but the

Table 30

Effects of Allocating Larger Shares of Chapter 1 Funds
According to the Concentration Grant Formula, Fiscal Year 1989
(Allocations in thousands of dollars)

State	Actual FY 1989 Allocation (Concentration Grant Share= 4.3 Percent)	Actual Concentration Grant Formula (Thresholds = 15 percent or 6,500): Concentration Grant Share = 20 Percent		Actual Concentration Grant Formula (Thresholds = 15 percent or 6,500): Concentration Grant Share = 50 Percent		Modified Concentration Grant Formula (Threshold = 25 percent): Concentration Grant Share = 20 Percent		Modified Concentration Grant Formula (Threshold = 25 percent): Concentration Grant Share = 50 Percent	
		Allocation	Percentage Change	Allocation	Percentage Change	Allocation	Percentage Change	Allocation	Percentage Change
Alabama	86,147	90,566	4.9	99,027	13.0	87,350	1.4	90,988	.6
Alaska	6,886	7,042	2.2	7,342	6.2	7,042	2.3	7,342	6.6
Arizona	44,471	46,084	3.5	49,173	9.5	40,055	-9.9	34,101	-23.3
Arkansas	47,942	49,897	3.9	53,642	10.6	53,704	12.0	63,159	31.7
California	396,257	410,092	3.4	436,587	9.2	341,847	-13.7	265,976	-32.9
Colorado	36,364	34,668	-4.9	31,421	-15.7	31,132	-14.4	22,580	-37.9
Connecticut	42,899	41,006	-4.6	37,382	-14.7	36,306	-15.4	25,632	-40.2
Delaware	11,639	11,416	-2.0	10,989	-5.9	10,929	-6.1	9,772	-16.0
District of Columbia	18,276	19,273	5.2	21,183	13.7	26,291	43.9	38,728	111.9
Florida	168,118	172,860	2.7	181,940	7.6	144,847	-13.8	111,908	-33.4
Georgia	114,215	116,766	2.2	121,652	6.1	129,947	13.8	154,604	35.4
Hawaii	11,967	11,640	-2.8	11,014	-8.6	11,214	-6.3	9,950	-16.9
Idaho	11,962	11,635	-2.8	11,011	-8.6	11,210	-6.3	9,947	-16.8
Illinois	188,824	187,985	-0.5	186,379	-1.3	157,629	-16.5	110,489	-41.5
Indiana	61,864	55,421	-11.6	43,081	-43.6	52,486	-15.2	35,745	-42.2
Iowa	33,674	30,219	-11.4	23,604	-42.6	29,272	-13.1	21,236	-36.9
Kansas	26,049	23,765	-9.6	19,392	-34.3	22,913	-12.0	17,261	-33.7
Kentucky	71,858	74,091	3.0	78,369	8.3	81,395	13.3	96,629	34.5
Louisiana	95,745	98,749	3.0	104,502	8.3	109,579	14.4	131,578	37.4
Maine	18,962	18,011	-5.3	16,191	-17.1	16,948	-10.6	13,533	-28.6
Maryland	67,158	64,837	-3.6	60,393	-11.2	75,337	12.2	86,642	29.0
Massachusetts	93,218	91,717	-1.6	88,842	-4.9	87,896	-5.7	79,289	-14.9
Michigan	154,593	150,995	-2.4	144,103	-7.2	126,040	-18.5	81,715	-47.1
Minnesota	48,227	45,042	-7.1	38,942	-23.8	40,856	-15.3	28,475	-41.0
Mississippi	77,692	81,237	4.4	88,027	11.7	100,875	29.8	137,122	76.5
Missouri	65,940	65,016	-1.4	63,245	-4.2	67,494	2.4	69,442	5.3
Montana	12,119	11,609	-4.4	10,632	-13.9	11,377	-6.1	10,051	-17.1
Nebraska	19,396	18,180	-6.7	15,852	-22.3	17,355	-10.5	13,787	-28.9
Nevada	7,479	7,538	0.8	7,652	2.2	7,538	0.8	7,652	2.3
New Hampshire	9,545	9,266	-3.0	8,732	-9.3	9,266	-2.9	8,732	-8.5
New Jersey	132,113	131,166	-0.7	129,351	-2.1	138,844	5.1	148,548	12.4
New Mexico	31,645	33,357	5.1	36,634	13.6	35,263	11.4	41,401	30.8
New York	430,300	435,686	1.2	446,000	3.5	494,850	15.0	593,911	38.0
North Carolina	94,421	93,548	-0.9	91,875	-2.7	94,113	-0.3	93,289	-1.2
North Dakota	8,883	8,948	0.7	9,071	2.0	8,661	-2.5	8,354	-6.0
Ohio	137,408	130,355	-5.4	116,849	-17.5	113,056	-17.7	73,601	-46.4
Oklahoma	39,380	38,724	-1.7	37,468	-5.1	36,515	-7.3	31,946	-18.9
Oregon	32,408	28,734	-12.8	21,697	-49.3	28,308	-12.7	20,634	-36.3
Pennsylvania	194,578	184,705	-5.4	165,798	-17.3	197,159	1.3	196,931	1.2
Rhode Island	15,328	15,223	-0.7	15,022	-2.0	13,854	-9.6	11,599	-24.3
South Carolina	62,820	64,060	1.9	66,437	5.4	66,257	5.5	71,929	14.5
South Dakota	12,248	12,194	-0.4	12,090	-1.3	14,175	15.7	17,044	39.2
Tennessee	84,399	87,765	3.8	94,211	10.4	89,044	5.5	97,409	15.4
Texas	261,325	266,593	2.0	276,684	5.5	263,107	0.7	267,968	2.5
Utah	14,247	13,542	-5.2	12,202	-16.7	13,117	-7.9	11,139	-21.8
Vermont	8,586	8,464	-1.4	8,231	-4.3	8,464	-1.4	8,231	-4.1
Virginia	80,057	78,989	-1.4	76,943	-4.0	81,104	1.3	82,232	2.7
Washington	46,285	42,933	-7.8	36,513	-26.7	39,339	-15.0	27,527	-40.5
West Virginia	37,953	38,233	0.7	38,770	2.1	35,939	-5.3	33,034	-13.0
Wisconsin	59,710	55,128	-8.3	46,352	-28.8	50,351	-15.7	34,410	-42.4
Wyoming	5,106	5,554	8.1	6,412	20.3	5,554	8.8	6,412	25.6
Puerto Rico	149,271	157,415	5.2	173,014	13.7	214,734	43.9	316,310	111.9
United States	3,987,950	3,987,940	0.0	3,987,925	0.0	3,987,940	0.0	3,987,925	0.0

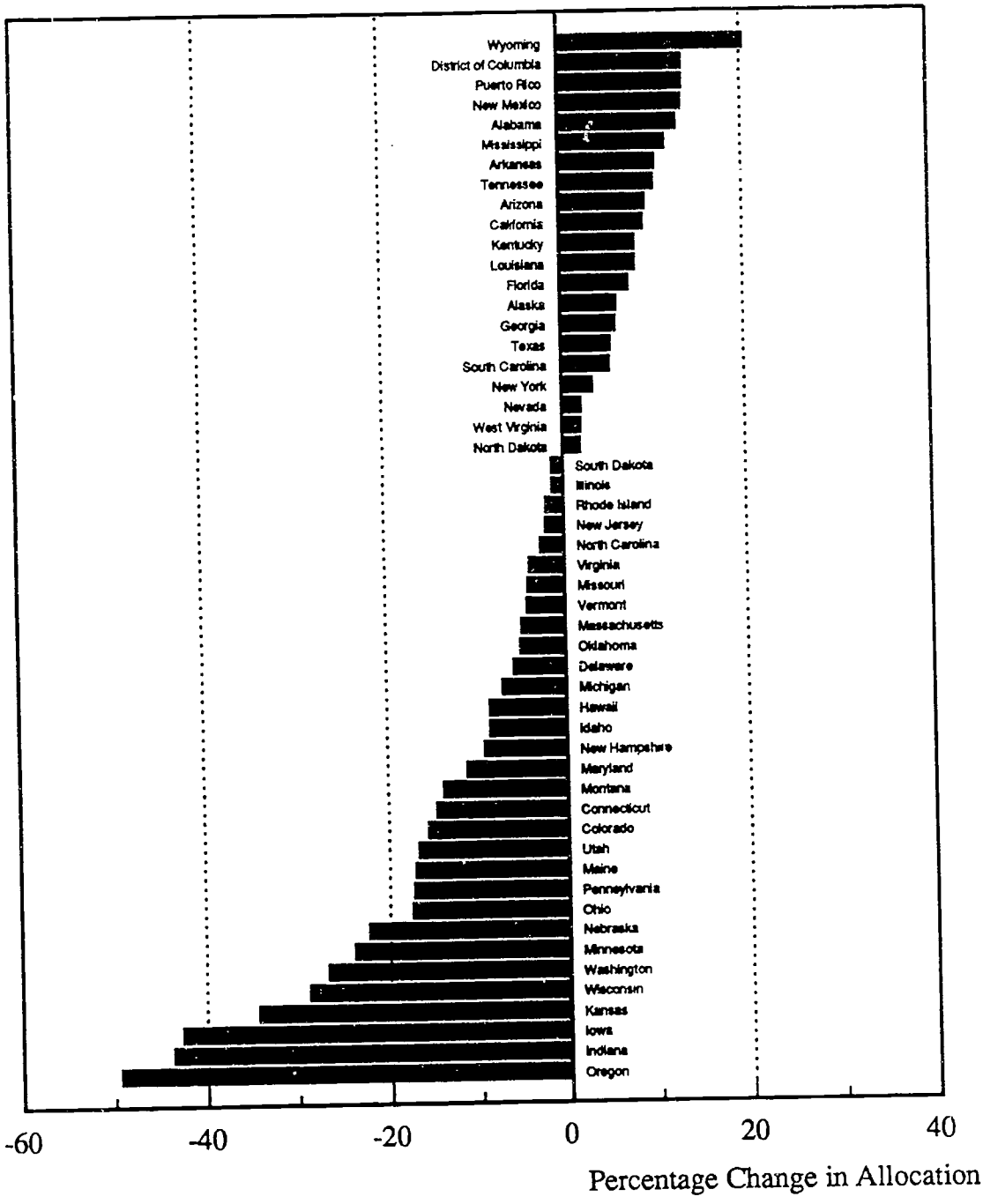
Concentration Grant share is raised to 20 percent and 50 percent, respectively, of total Chapter 1 funds. Under the third and fourth alternatives, the Concentration Grant formula is altered by eliminating the absolute threshold entirely and setting the percentage threshold at 25 percent. The Basic Grant formula remains unchanged, but of course it controls the distribution of reduced fractions of the total Chapter 1 pie as funds are shifted out of Basic Grants and into the Concentration Grant component.

What is notable about the first set of results in Table 30 (keeping the formula unchanged but applying it to 20 percent of Chapter 1 funds) is how little the interstate distribution is affected by even a rather large increase in the Concentration Grant share when the Concentration Grant formula itself is left unchanged. The increase in that share from 4.3 to 20 percent--that is, almost quintupling the Concentration Grant share--changes the allocations of only 3 states by more than 10 percent and the allocations of only 12 others by more than 5 percent. This result underscores the point that the current Concentration Grants--their label notwithstanding--are not so highly concentrated. Their distribution is only moderately different, rather than sharply different, from that of the Chapter 1 Basic Grants.

The more drastic alternative of distributing half of all Chapter 1 funds as Concentration Grants naturally amplifies the redistributive effects. With the Concentration Grant share raised to 50 percent, several states would lose 40 percent or more of their Chapter 1 funds (Indiana, Iowa, and Oregon), and 10 others would lose between 15 and 35 percent of their allotments. The pattern of gains and losses, depicted in Figure 11, was foreshadowed by the data on state shares in Table 28. Some of the main gainers are southern states; the clearest losers are from the Midwest. Western states appear at both the top and bottom ends

Figure 11

Changes in Allocations as a Result of Raising the Concentration Grant Share of Chapter 1 Funds to 50 Percent



of the distribution, and most northeastern states, being only slightly affected, cluster around the center.

The last four columns of Table 30 show how tilting the Concentration Grant formula itself more sharply toward high-poverty counties increases the sensitivity of Chapter 1 allocations to the Concentration Grant share of the pie. With the more steeply tilted (25 percent threshold) Concentration Grant formula in place, raising the Concentration Grant share to 20 percent makes much more of a difference. Certain northeastern states and certain low-income southern and western states share in the benefits. The offsetting losses are spread over no fewer than 30 states. A 50-50 split between the Basic and Concentration Grant formulas (represented in the last two columns of the table) amplifies the effects, greatly increasing the allocations to, among others, Mississippi and New York and reducing aid to 14 states by at least 40 percent. In sum, shifting Chapter 1 funds from Basic Grants to Concentration Grants is not highly consequential with the current Concentration Grant formula but could become so if the formula were tilted more strongly towards counties where the problems of poverty are worst.

Effects of Incorporating Poverty Factors into Other Grant Formulas: Illustration Using the Mathematics and Science Program

Although the poverty indicator has been discussed thus far only in connection with Chapter 1 Grants to LEAs, it also affects allocations under two other programs, Mathematics and Science and (as of FY 1990) Drug-Free Schools. In addition, there are reasons to consider taking poverty into account in allocating funds under such programs as Vocational Education and Chapter 2 Block Grants. To avoid undue repetition, the following analysis does not examine all the programs in which poverty indicators do or could play a role.

Instead, it uses the Mathematics and Science program as a vehicle for illustrating the general effects.

The Mathematics and Science program distributed one-half its FY 1989 grants to states in proportion to population 5-17 and the other half in proportion to state allocations under Chapter 1, subject to the constraints that each state had to receive at least 1/2 of 1 percent of the available funds and that no state could receive less aid than it received in FY 1988. Chapter 1 allocations, used here as a formula factor, are, of course, based mainly on the number of poor children in each state. Thus poverty enters into the Mathematics and Science formula by a slightly indirect route. Two questions concerning the role of poverty in this formula are addressed here: (1) How does distributing half the Mathematics and Science money according to state Chapter 1 allocations change the distribution from what it would be if it were still based wholly on school-age population? (2) How would the distribution be altered if the formula distributed one-half the available funds according to the number of poor children in each state rather than according to state Chapter 1 allocations?

Answers to both questions are provided by Table 31. Taking a hypothetical allocation according to population 5-17 as a base case, the table first shows how the distribution of Mathematics and Science funds has been altered by the decision to distribute 50 percent of the available funds according to the states' Chapter 1 allocations. The pattern of changes is also shown in the left-hand bar chart of Figure 12. The general effect, naturally, is to favor states that do well under the Chapter 1 Basic Grant formula at the expense of states that receive below-average allocations of Chapter 1 funds relative to their school-age populations. Thus northeastern states such as New York, New Jersey, and Massachusetts benefit from the change, as do southern states such as Mississippi and Louisiana; but states such as Minnesota,

Table 31

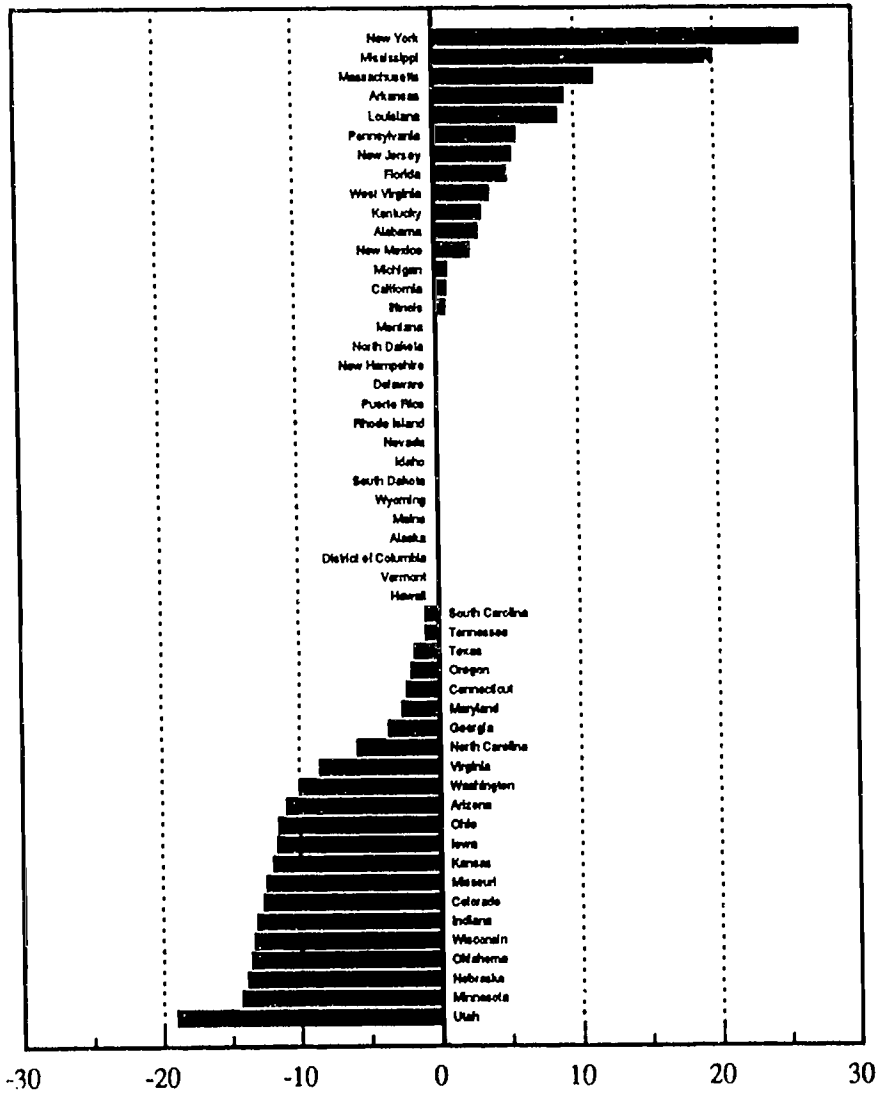
Effects of Incorporating the Poverty Factor into a Fund Allocation Formula: Illustration Using the Mathematics and Science Program, Fiscal Year 1989 (Allocations in thousands of dollars)

State	Base Case: Hypothetical Allocation According to Population 5-17 Only	Actual Allocation: 50 Percent According to Population 5-17; 50 Percent According to Chapter 1 Allocation			Hypothetical Allocation: 50 Percent According to Population 5-17; 50 Percent According to Poverty Rate		
		Amount	Difference	Percentage Change from Base Case	Amount	Difference	Percentage Change from Base Case
Alabama	2,192	2,260	68	3.1	2,715	523	23.8
Alaska	635	635	0	0.0	635	0	0.0
Arizona	1,686	1,502	-183	-10.9	1,699	13	0.8
Arkansas	1,267	1,384	117	9.3	1,553	286	22.6
California	13,335	13,448	113	0.8	12,768	-567	-4.2
Colorado	1,613	1,411	-203	-12.6	1,372	-242	-15.0
Connecticut	1,448	1,414	-34	-2.3	1,268	-180	-12.4
Delaware	635	635	0	0.0	635	0	0.0
District of Columbia	635	635	0	0.0	635	0	0.0
Florida	5,046	5,310	265	5.2	5,381	335	6.6
Georgia	3,358	3,236	-121	-3.6	3,881	523	15.6
Hawaii	635	635	0	0.0	635	0	0.0
Idaho	635	635	0	0.0	635	0	0.0
Illinois	5,798	5,841	43	0.7	5,533	-265	-4.6
Indiana	2,880	2,502	-378	-13.1	2,502	-378	-13.1
Iowa	1,429	1,264	-166	-11.6	1,264	-166	-11.6
Kansas	1,221	1,076	-146	-11.9	1,035	-187	-15.3
Kentucky	1,968	2,033	65	3.3	2,319	351	17.8
Louisiana	2,480	2,702	222	8.9	3,072	591	23.8
Maine	635	635	0	0.0	635	0	0.0
Maryland	2,112	2,057	-55	-2.6	1,869	-243	-11.5
Massachusetts	2,526	2,813	287	11.4	2,267	-259	-10.2
Michigan	4,787	4,830	43	0.9	4,312	-475	-9.9
Minnesota	2,102	1,804	-297	-14.2	1,804	-297	-14.2
Mississippi	1,547	1,854	307	19.9	2,270	723	46.8
Missouri	2,507	2,197	-310	-12.4	2,385	-122	-4.9
Montana	635	635	0	0.0	635	0	0.0
Nebraska	805	694	-111	-13.8	705	-100	-12.5
Nevada	635	635	0	0.0	635	0	0.0
New Hampshire	635	635	0	0.0	635	0	0.0
New Jersey	3,515	3,710	195	5.5	3,266	-249	-7.1
New Mexico	832	853	20	2.5	994	162	19.4
New York	8,302	10,476	2174	26.2	8,919	617	7.4
North Carolina	3,171	2,987	-184	-5.8	3,397	226	7.1
North Dakota	635	635	0	0.0	635	0	0.0
Ohio	5,502	4,870	-632	-11.5	4,921	-581	-10.6
Oklahoma	1,694	1,464	-229	-13.5	1,670	-24	-1.4
Oregon	1,323	1,297	-26	-2.0	1,136	-187	-14.2
Pennsylvania	5,515	5,833	318	5.8	5,107	-408	-7.4
Rhode Island	635	635	0	0.0	635	0	0.0
South Carolina	1,827	1,811	-16	-0.9	2,122	295	16.1
South Dakota	635	635	0	0.0	635	0	0.0
Tennessee	2,462	2,439	-23	-0.9	2,823	362	14.7
Texas	9,286	9,129	-157	-1.7	10,123	836	9.0
Utah	1,187	962	-225	-19.0	972	-215	-18.1
Vermont	635	635	0	0.0	635	0	0.0
Virginia	2,768	2,533	-235	-8.5	2,668	-100	-3.6
Washington	2,206	1,984	-222	-10.0	1,861	-344	-15.6
West Virginia	995	1,033	39	3.9	1,078	83	8.4
Wisconsin	2,435	2,112	-323	-13.3	2,099	-335	-13.8
Wyoming	635	635	0	0.0	635	0	0.0
Puerto Rico	3,046	3,046	0	0.0	3,046	0	0.0
United States	127,067	127,067	0	0.0	127,067	0	0.0

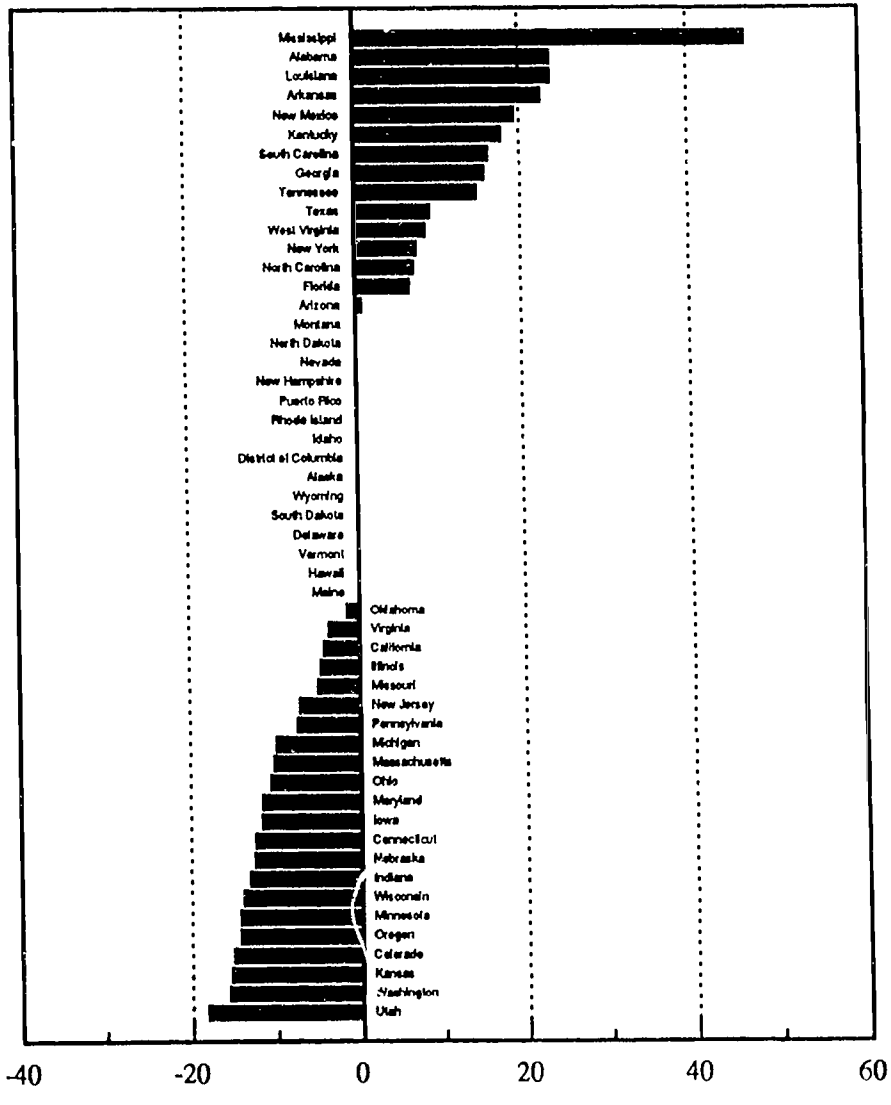
Figure 12

Changes in Allocations as a Result of Incorporating State Chapter 1 Allocations or Poverty Counts into the Mathematics and Science Grant Formula

Effects of Adding the Chapter 1 Allocation to the Formula



Effects of Adding the Poverty Count to the Formula



Nebraska, Oklahoma, and Wisconsin lose 15 to 17 percent of their aid, and Utah--the state that receives by far the lowest per-pupil allocation under the Chapter 1 formula--loses 23 percent of what it would otherwise have received.

The right-hand portion of the table and the right-hand chart in the figure show what would happen if allocations of half the Mathematics and Science funds were based on counts of poor children rather than on state Chapter 1 allocations. The reason that the distribution would be altered is, of course, that Chapter 1 allocations, though based mainly on poverty counts, are also influenced by the per-pupil expenditure factor in the Chapter 1 formula. That influence now carries through to the Mathematics and Science grants, but it would disappear if the Chapter 1 poverty count replaced the Chapter 1 allocation as a formula factor. The table and the diagram show that state allocations would change considerably. New York would still receive more aid than under a formula based on population 5-17 only, but New Jersey and Massachusetts would become losers rather than gainers. High-income states that were slight losers under the previous alternative (e.g., Connecticut and Maryland) would now fare considerably worse. Most southern states would do considerably better because their allocations would no longer be depressed by their low scores on the per-pupil expenditure factor. Some states that lost substantially under the previous alternative would lose less under this one, but Utah would still be the most adversely affected state.[12]

What can be said about the desirability of including a poverty factor in the Mathematics and Science formula (and, by extension, in the formulas for distributing other federal education grants)? The general case for taking poverty into account rests on the association between low income and educational needs. In the particular case of Mathematics and Science grants, the underlying premise is presumably that low-income pupils tend to be

low-achievers in mathematics and science (as in other subjects), and hence that the achievement gap to be filled, and consequently the need for resources, is greater where there are more low-income children. There is ample support for this proposition and hence for conditioning the distribution of such aid partly on the incidence of poverty. Much the same argument could be made regarding relative needs for educational improvement in general, and hence for adding a poverty factor to the formula for allocating Chapter 2 Block Grant funds, but no such change has yet been made.[13] In the case of Drug-Free Schools grants, which are now allocated partly in proportion to each state's Chapter 1 allocation, the parallel argument is that the prevalence of drug problems increases with the incidence of poverty (the option of adding a poverty factor to the Drug-Free Schools formula is examined later). Even in the case of aid for education of the handicapped, it can be argued that the problems of dealing with handicaps are exacerbated by poor economic conditions. Thus the options considered here have wide applicability throughout the realm of federal education aid.

Finally, the question of whether poverty should be taken into account in distributing federal aid merits special attention in connection with the Vocational Education program. In reauthorizing the Perkins Vocational Education Act last year, Congress made two relevant and significant changes in the law. One was to strengthen the act's emphasis on providing federally funded vocational education services to disadvantaged pupils. The other was to mandate a *substate* fund allocation process based heavily on the distribution of Chapter 1 funds to LEAs. These developments make almost unavoidable the issue of whether it would now be appropriate, given the program's new orientation toward the poor and disadvantaged, to take poverty into account in allocating aid among as well as within states.

Summary

Poverty indicators play such important roles in the present (and proposed) mechanisms for allocating federal education aid that great importance attaches to the questions of how poverty should be measured and reflected in fund allocation formulas. Consideration of some aspects of poverty measurement must be deferred until income data from the 1990 Census become available, but several issues concerning poverty factors have been examined here.

Two possible short-term solutions have been examined to the perennial problem that Census poverty counts are badly out of date. One approach, allocating funds according to Census-year percentages rather than absolute numbers of poor children, would be useful for offsetting the effects of gross redistributions in the school-age population among states. Another option, using mid-decade estimates of child poverty, is attractive in principle but not satisfactory in practice because of doubts about data quality; however, it does raise the issue of whether steps should be taken to produce official estimates for years between the decennial Censuses.

The alternative of allocating aid according to the number of children eligible for free school lunches is attractive because eligibility is based on a poverty criterion and the school lunch data are available annually, but certain concerns would have to be addressed before such an approach could be recommended. The key question is whether eligibility for free school lunches is an adequate proxy for poverty. Other questions concern the extent to which school lunch figures are influenced by differences in state and local policies and thus may be subject to manipulation. At least some of these concerns should be resolvable once the 1990 Census data become available.

Some of the more complex poverty-related issues concern the role of poverty concentration, as distinguished from poverty incidence, as a factor in distributing Chapter 1 grants. The interstate distribution of Concentration Grants is quite sensitive both to the criteria on which eligibility for such grants is based (absolute versus relative concentration) and on the specific numerical settings of the eligibility thresholds. The degree to which Concentration Grant funds are actually concentrated is now mild to moderate, raising the question of whether greater concentration might be appropriate. Because of this moderation, the fraction of total Chapter 1 funds distributed as Concentration Grants would have to be raised sharply to affect the overall distribution of aid substantially. The basic issue, which deserves further analysis and debate, is how strongly federal aid should be focused on places with the most severe poverty problems.

The effects of taking poverty into account in distributing aid under programs other than Chapter 1 have been examined through simulations of changes in the Mathematics and Science grants program. The current Mathematics and Science formula, which distributes funds partly according to each state's Chapter 1 allocation, gives considerably more aid to a mix of low-income states and northeastern urban states than would a formula based only on school-age population; however, substituting an explicit indicator of poverty for the Chapter 1 allocation would alter the results considerably. There are reasons to consider incorporating poverty factors into other federal aid formulas, including those for Chapter 2 Block Grants and, especially, Vocational Education.

CHANGES IN NEED INDICATORS (OTHER THAN POVERTY)

The principal need indicators in the current education aid programs (other than poverty) include school-age population (population 5-17), populations in other age groups (in

the Vocational Education formula), numbers of pupils with specified conditions who are actually served under state or local programs (in the various programs of aid to the handicapped), and more specialized pupil-count indicators used in some of the smaller programs. In Chapter 2, the adequacy of these indicators was questioned in two respects: First, it was noted that the present need factors reflect only the incidence, but not the severity, of educational problems. Second, it was suggested that some of the present need factors are too broad and nonspecific to reflect the purposes of federal aid. This section examines possible approaches to dealing with these concerns. The first part of the discussion, focusing on federal aid for education of the handicapped, shows how the severity of needs may be taken into account by incorporating differential weights into the fund allocation formulas to reflect the unequal costs of serving children with different handicaps. The second part demonstrates how, in a variety of programs, need indicators might be altered to reflect program goals more specifically than they do now.

Taking the Severity of Needs into Account: Aid for Education of the Handicapped

Federal grants for the handicapped under both the EHA Basic Grants program and the program of Chapter 1 Grants for the Handicapped are distributed according to the number of handicapped children served in each state, without regard to the nature of the children's handicapping conditions. The reasonableness of taking undifferentiated, unweighted counts of the handicapped as indicators of need for assistance is called into question by evidence that costs of educating handicapped children vary widely by handicapping condition. Under the present formulas, for example, a state receives the same federal aid for serving a speech-impaired child as for serving a deaf child; yet the incremental cost of special education for a

deaf child is estimated to be more than 15 times as much, on average, as the incremental cost of serving a child with a speech impairment.

The feasibility of taking the varying severity of different handicapping conditions into account has been demonstrated by programs of state aid to local school districts that do precisely that. Typically, such programs distribute state categorical aid for special education of the handicapped in proportion to *weighted* counts of handicapped pupils, where the weights are based on the relative costs of providing programs and services to pupils with each type of handicap. We investigate here what the effects would be of using the same type of weighted-pupil formula to distribute EHA and Chapter 1 Grants for the Handicapped among the states.

Estimates of the average costs incurred nationally to serve pupils with different handicapping conditions were developed in a recent major study of costs of special education and are summarized in Table 32.[14] The dollar amounts shown in this table represent the *excess costs*, or incremental costs, of special education for each type of pupil--that is, costs over and above the costs of educating "regular" (nonhandicapped) pupils. These excess costs measure the extra financial burdens that states and school systems must incur to provide special education for the handicapped, and hence are the appropriate indicators of needs for federal financial assistance. As can be seen from the table, these excess costs vary from only about 27 percent of the cost of the regular program for the speech impaired and 74 percent for the learning disabled to 394 percent for the deaf and 1,130 percent for the deaf-blind.

Data on numbers of handicapped children with different handicapping conditions, by state, are provided in an annual report to Congress prepared by the Office of Special Education and Rehabilitative Services (OSERS) of the U.S. Office of Education (OSERS, 1989). This report, based on state-compiled data, classifies the handicapped into the same 11

Table 32

Excess Costs of Serving Different Types of Handicapped Pupils

Handicapping Condition	Average Excess Cost ($ per pupil)	Ratio of Excess Cost to Regular Expenditure
Learning disabled	2,058	0.74
Mentally retarded	4,615	1.66
Speech impaired	737	0.27
Multi-handicapped	7,232	2.60
Other health impaired	3,024	1.09
Orthopedically handicapped	4,812	1.73
Emotionally disturbed	5,300	1.91
Deaf	10,947	3.94
Hard of hearing	4,733	1.70
Deaf-blind	31,416	11.30
Visually handicapped	5,317	1.91

categories as shown in Table 32. It provides separate data for children served in the EHA Basic Grants Program and in the Chapter 1 program of Grants for the Handicapped. Tables 33 and 34 present percentage breakdowns, by handicapping condition, of children ages 6-21 served under the two programs.[15]

It has been argued that disaggregating handicapped children by type of handicap for the purpose of distributing federal aid to states is unnecessary because different types of handicapped children (unlike, say, low-income children) tend to be distributed relatively uniformly around the country. But if the data in these tables are even roughly correct, this uniformity has been greatly exaggerated. There are some large interstate disparities in the

Table 33

Pupils by Handicapping Condition and Weighted Pupil Counts,
EHA Basic Grants Program, Fiscal Year 1989

State	Percentage of Handicapped Pupils by Handicapping Condition a/											Weighting Factor	Unweighted Count of Handicapped	Weighted Count of Handicapped
	MR	HH	DF	SI	VH	ED	OI	OHI	LD	DB	MH			
Alabama	31.9	0.5	0.2	23.9	0.3	6.5	0.6	0.8	34.2	0.0	1.0	1.04	102,545	106,948
Alaska	17.2	0.5	0.5	20.5	0.3	4.8	0.7	1.0	52.5	0.0	2.2	0.93	12,231	11,410
Arizona	8.3	1.1	0.0	22.5	0.3	6.6	0.9	0.7	57.3	0.0	2.3	0.86	53,673	45,936
Arkansas	24.1	0.5	0.3	16.3	0.3	0.8	0.2	0.5	56.2	0.1	0.7	0.94	44,210	41,654
California	5.9	0.9	0.6	23.0	0.6	2.8	1.7	2.9	60.2	0.0	1.3	0.81	427,846	346,307
Colorado	5.4	1.4	0.0	16.7	0.5	18.5	1.4	0.0	51.5	0.0	4.6	1.05	48,355	50,660
Connecticut	6.5	0.7	0.2	16.4	0.0	19.5	0.4	0.6	54.3	0.0	1.3	1.00	60,260	60,191
Delaware	6.1	0.8	0.0	16.6	0.1	11.9	0.2	0.4	63.1	0.0	0.8	0.88	10,376	9,180
District of Columbia	7.3	0.7	0.0	31.7	0.7	2.8	0.2	0.0	56.0	0.0	0.5	0.72	2,974	2,136
Florida	11.0	0.0	0.6	30.8	0.3	11.3	1.1	1.3	43.6	0.0	0.0	0.87	199,996	173,600
Georgia	25.9	0.6	0.3	21.7	0.4	20.0	0.9	0.4	30.0	0.0	0.0	1.14	90,985	103,665
Hawaii	9.5	1.4	0.6	18.7	0.6	6.4	1.7	1.1	58.5	0.0	1.2	0.91	11,801	10,683
Idaho	15.5	0.8	0.2	17.3	0.3	2.5	1.7	2.9	57.6	0.0	1.1	0.90	19,271	17,312
Illinois	8.9	0.6	0.1	29.3	0.3	7.9	0.6	0.7	51.6	0.0	0.1	0.80	205,514	163,858
Indiana	17.3	0.7	0.0	36.5	0.4	4.4	0.4	0.1	39.9	0.0	0.3	0.80	100,521	80,682
Iowa	20.3	1.2	0.0	18.2	0.2	12.4	1.8	0.0	44.6	0.0	1.1	1.04	56,196	58,577
Kansas	14.1	1.1	0.0	28.2	0.4	10.3	1.0	0.5	43.4	0.1	0.9	0.91	41,074	37,275
Kentucky	26.8	0.8	0.0	32.5	0.5	4.0	0.6	0.4	33.2	0.0	1.2	0.93	73,109	67,659
Louisiana	15.4	1.0	0.5	30.6	0.5	5.7	1.3	2.1	42.2	0.0	0.8	0.87	65,168	56,713
Maine	10.6	0.7	0.2	22.7	0.4	14.8	0.9	1.1	45.4	0.0	3.1	0.99	27,080	26,922
Maryland	6.6	0.8	0.3	30.0	0.6	4.5	0.8	1.1	52.1	0.0	3.2	0.81	87,523	70,902
Massachusetts	21.2	0.8	0.6	22.9	0.6	13.8	1.1	1.4	35.3	0.1	2.2	1.09	133,796	145,870
Michigan	9.8	0.0	0.0	24.2	0.5	12.8	2.7	0.1	49.9	0.0	0.0	0.90	149,706	134,702
Minnesota	14.3	1.6	0.0	19.0	0.4	14.6	1.6	0.5	47.7	0.0	0.2	1.00	81,119	80,924
Mississippi	15.5	0.5	0.0	32.5	0.2	0.4	1.2	0.0	49.3	0.0	0.4	0.76	58,406	44,508
Missouri	13.9	0.5	0.3	26.7	0.3	8.6	0.8	0.5	48.1	0.1	0.4	0.88	98,136	86,668
Montana	8.0	0.8	0.1	25.3	0.5	4.5	0.7	1.3	56.7	0.0	2.1	0.82	15,068	12,354
Nebraska	14.9	1.5	0.0	26.4	0.6	8.4	2.3	1.3	43.6	0.0	1.3	0.92	31,159	28,770
Nevada	7.4	0.5	0.5	20.7	0.5	5.9	1.4	0.7	60.5	0.0	1.8	0.86	15,471	13,257
New Hampshire	4.9	0.3	0.1	17.2	0.1	10.0	0.8	1.9	64.1	0.0	0.6	0.85	16,653	14,216
New Jersey	3.1	0.4	0.3	31.7	0.1	8.7	0.3	0.3	51.5	0.0	3.6	0.81	168,794	135,991
New Mexico	6.8	0.9	0.1	29.2	0.4	10.3	1.7	0.3	48.3	0.0	2.0	0.86	31,339	26,938
New York	7.7	0.6	0.2	8.4	0.4	14.5	0.4	1.0	64.6	0.0	2.0	1.00	259,333	260,523
North Carolina	19.5	1.2	0.0	22.7	0.5	8.2	0.8	1.9	44.3	0.0	0.9	0.96	111,332	106,530
North Dakota	12.4	1.0	0.0	31.7	0.4	3.9	0.8	0.6	49.2	0.0	0.0	0.78	12,012	9,314
Ohio	22.8	1.1	0.0	27.0	0.4	4.1	2.0	0.0	40.4	0.0	2.3	0.95	190,928	180,958
Oklahoma	19.1	0.5	0.3	26.7	0.3	2.3	0.5	0.2	48.3	0.1	1.6	0.88	63,288	55,598
Oregon	3.7	0.2	0.1	27.8	0.1	5.1	1.2	1.7	60.2	0.0	0.0	0.73	45,539	33,036
Pennsylvania	16.8	1.2	0.1	28.5	0.5	8.1	0.4	0.0	44.4	0.0	0.0	0.88	190,454	167,532
Rhode Island	5.3	0.4	0.5	16.4	0.3	7.3	0.7	1.3	67.5	0.0	0.3	0.84	19,237	16,115
South Carolina	21.7	1.0	0.2	26.2	0.5	8.8	1.1	0.2	39.9	0.0	0.4	0.96	75,173	72,130
South Dakota	12.3	1.9	0.1	30.9	0.3	3.5	0.9	0.7	46.7	0.1	2.8	0.84	13,931	11,755
Tennessee	14.2	0.9	0.2	24.8	0.8	2.2	1.0	2.0	51.9	0.0	1.9	0.86	100,747	86,555
Texas	7.9	0.4	0.0	20.2	0.5	8.1	1.2	2.9	57.7	0.0	1.1	0.87	310,592	268,679
Utah	7.8	0.6	0.1	18.9	0.2	23.1	0.5	0.8	45.3	0.0	2.5	1.06	41,267	43,892
Vermont	6.7	0.9	0.2	31.2	0.3	7.4	0.9	1.2	51.0	0.1	0.1	0.79	10,181	7,997
Virginia	13.5	0.7	0.3	23.6	0.1	8.0	0.7	0.5	51.7	0.0	0.9	0.89	114,887	102,300
Washington	10.5	1.5	0.5	18.9	0.3	6.4	1.3	5.1	53.5	0.0	2.2	0.93	73,097	67,829
West Virginia	20.2	0.6	0.1	26.1	0.3	5.4	0.7	0.1	46.5	0.0	0.0	0.89	43,474	38,523
Wisconsin	7.1	0.2	0.1	19.0	0.3	14.6	0.6	0.3	34.5	0.0	23.3	1.34	76,565	102,275
Wyoming	6.8	1.2	0.3	26.7	0.6	5.8	1.6	2.4	54.7	0.0	0.0	0.80	9,716	7,768
Puerto Rico	48.5	1.0	2.3	4.0	1.8	2.8	1.0	2.2	31.2	0.2	5.0	1.44	35,268	50,614
United States	13.0	0.8	0.2	23.9	0.4	8.4	1.0	1.2	49.3	0.0	1.6	0.91	4,337,376	3,959,924

a/ Key to handicapping conditions:

MR = Mentally retarded
HH = Hard of hearing
DF = Deaf
SI = Speech impaired
VH = Visually handicapped
ED = Emotionally disturbed
OI = Orthopedically impaired
OHI = Other health impaired
LD = Learning disabled
DB = Deaf-blind
MH = Multihandicapped

Table 34

Pupils by Handicapping Condition and Weighted Pupil Counts,
Chapter 1 Grants for the Handicapped, Fiscal Year 1989

State	Percentage of Handicapped Pupils by Handicapping Condition a/											Weighting Factor	Unweighted Count of Handicapped	Weighted Count of Handicapped
	MR	HH	DF	SI	VH	ED	OI	OHI	LD	DB	MH			
Alabama	7.0	1.7	32.8	0.0	17.5	28.1	0.0	0.0	0.0	2.1	10.7	2.83	661	1,870
Alaska	5.7	1.6	0.1	25.6	0.4	2.2	0.7	0.8	60.2	0.0	2.7	0.78	2,878	2,248
Arizona	7.6	52.0	0.0	4.3	12.1	0.4	1.6	4.3	0.0	0.0	17.7	1.80	1,483	2,664
Arkansas	59.6	1.1	9.4	4.5	5.0	0.2	3.2	1.7	2.8	0.1	12.5	1.92	3,449	6,637
California	30.6	0.1	26.0	10.2	2.5	17.6	0.2	0.4	10.7	1.0	0.7	2.17	3,233	7,004
Colorado	26.4	4.8	0.0	4.9	1.6	14.3	3.8	0.0	6.9	2.4	34.8	2.13	4,750	10,119
Connecticut	7.8	0.7	2.2	0.8	12.5	30.6	0.2	0.3	39.0	0.4	5.4	1.54	4,645	7,144
Delaware	24.2	1.7	1.4	0.0	2.0	22.7	7.6	3.3	33.4	1.0	2.7	1.55	3,532	5,482
District of Columbia	22.0	0.5	0.0	4.4	0.6	21.9	1.9	1.5	42.9	0.2	4.0	1.31	4,239	5,548
Florida	74.8	0.0	8.8	0.0	2.7	13.7	0.0	0.0	0.0	0.1	0.0	1.91	7,929	15,128
Georgia	37.4	2.3	18.3	3.7	6.3	27.6	1.0	0.8	1.8	0.8	0.0	2.17	3,080	6,688
Hawaii	30.6	0.2	3.9	0.2	2.5	15.7	18.8	3.0	6.5	1.2	17.4	2.00	454	910
Idaho	19.2	1.5	43.4	6.1	0.0	16.7	0.0	0.0	0.0	0.0	13.1	2.73	199	544
Illinois	28.7	1.1	3.8	2.9	1.5	36.3	5.1	1.5	18.8	0.1	0.2	1.64	40,915	66,973
Indiana	60.4	1.6	7.7	4.3	3.7	4.6	3.0	1.1	4.5	0.1	9.0	1.85	9,324	17,227
Iowa	17.6	0.0	18.5	0.0	9.9	45.0	0.4	0.2	3.9	3.7	0.7	2.55	1,367	3,486
Kansas	18.6	0.0	13.9	7.8	3.8	32.3	2.0	0.4	5.1	1.5	14.6	2.20	2,634	5,785
Kentucky	35.4	1.2	15.1	6.7	6.9	10.9	2.2	1.1	6.3	0.2	14.0	2.04	3,517	7,178
Louisiana	46.7	0.9	10.8	1.5	3.2	13.2	5.5	2.4	4.4	0.5	10.9	2.02	4,197	8,489
Maine	21.9	0.9	4.4	2.5	0.4	44.9	1.2	0.9	5.9	0.3	16.7	1.96	1,187	2,331
Maryland	14.8	0.0	18.8	1.1	10.5	22.9	1.5	1.6	7.8	2.4	18.6	2.48	1,974	4,898
Massachusetts	21.2	0.8	0.6	23.1	0.6	13.7	1.1	1.4	35.2	0.1	2.2	1.09	16,713	18,199
Michigan	57.2	1.4	0.0	0.1	0.2	19.3	0.6	5.7	1.0	0.0	14.4	1.80	13,832	24,921
Minnesota	19.9	35.0	0.0	1.6	10.4	25.2	0.0	0.0	6.0	1.9	0.0	1.86	446	831
Mississippi	36.6	0.0	25.6	8.9	9.6	0.4	7.0	0.0	0.6	1.0	10.3	2.34	894	2,091
Missouri	88.6	0.0	6.7	0.0	1.7	1.4	0.0	0.0	0.0	0.2	1.4	1.85	2,529	4,688
Montana	13.2	2.1	30.2	2.1	35.5	0.8	0.4	0.0	3.3	1.2	11.2	2.61	762	1,985
Nebraska	20.3	24.5	0.0	0.4	10.0	18.0	0.0	4.6	18.4	0.0	3.8	1.58	299	471
Nevada	5.0	0.0	0.0	0.0	0.0	85.0	0.0	5.0	0.0	0.0	5.0	1.89	599	1,133
New Hampshire	25.3	10.9	5.6	4.7	8.8	8.4	3.0	3.6	13.5	0.7	15.6	1.84	1,037	1,913
New Jersey	36.2	0.1	6.8	0.8	8.5	20.4	2.1	1.1	7.0	1.9	15.1	2.14	6,194	13,227
New Mexico	24.9	10.3	28.7	0.0	0.0	28.0	0.0	0.0	0.0	7.3	0.8	3.10	266	824
New York	14.3	0.9	5.2	12.7	1.1	31.6	3.3	3.1	11.8	0.0	15.9	1.71	35,342	60,481
North Carolina	30.4	20.1	0.0	1.0	2.1	24.3	1.1	1.8	2.6	0.6	16.0	1.89	2,776	5,251
North Dakota	54.2	1.3	13.2	8.1	6.1	0.6	9.7	1.0	1.6	4.2	0.0	2.26	717	1,619
Ohio	21.8	1.9	0.0	0.0	2.0	1.9	0.0	0.0	0.2	0.0	72.1	2.35	9,599	22,549
Oklahoma	25.6	1.1	11.9	0.1	8.7	11.9	1.2	0.0	2.9	0.3	36.3	2.33	959	2,234
Oregon	40.2	12.0	5.8	4.2	5.8	13.1	6.7	6.3	5.5	0.3	0.0	1.73	8,270	14,345
Pennsylvania	39.1	1.8	2.0	6.7	1.6	27.1	4.8	0.0	17.0	0.0	0.0	1.53	23,152	35,465
Rhode Island	21.8	0.8	3.3	0.5	2.0	39.6	4.8	1.0	19.0	0.8	6.5	1.79	935	1,672
South Carolina	40.4	0.1	14.8	0.2	6.1	12.3	0.2	0.0	12.2	0.0	13.7	2.06	975	2,005
South Dakota	21.1	4.1	8.8	0.0	3.6	20.6	15.0	2.0	0.7	6.3	17.7	2.69	503	1,356
Tennessee	24.6	0.7	20.1	0.2	10.7	31.8	0.0	1.2	4.8	0.9	5.0	2.30	1,460	3,363
Texas	22.9	42.6	0.0	1.3	3.6	6.3	1.9	2.7	7.5	0.5	10.6	1.75	13,622	23,896
Utah	18.8	4.8	23.7	7.0	9.2	11.2	4.3	1.3	0.8	2.3	16.6	2.52	2,200	5,549
Vermont	51.1	2.1	2.5	17.5	0.7	8.2	2.1	1.3	7.4	0.1	6.9	1.50	2,799	4,209
Virginia	23.3	0.1	16.4	0.0	37.3	7.6	0.2	1.4	4.1	0.6	9.0	2.24	1,685	3,775
Washington	31.6	2.4	8.0	0.7	3.0	6.5	6.3	7.5	2.7	1.6	29.8	2.23	3,940	8,768
West Virginia	40.3	0.3	14.9	0.8	12.8	7.1	6.5	13.3	1.6	2.1	0.3	2.16	1,560	3,369
Wisconsin	11.5	0.0	0.2	3.8	3.5	12.6	1.2	0.7	3.9	0.0	62.6	2.20	3,178	6,997
Wyoming	53.6	3.6	12.7	0.0	0.0	29.1	0.0	0.0	0.0	0.0	0.9	2.03	1,219	2,478
Puerto Rico	67.7	0.1	0.3	0.0	0.2	2.8	13.7	3.1	0.6	0.0	11.3	1.77	1,081	1,911
United States	31.3	3.7	5.1	5.9	3.0	21.7	3.1	1.9	13.4	0.4	10.5	1.76	265,190	469,924

a/ Key to handicapping conditions:

MR = Mentally retarded
HH = Hard of hearing
DF = Deaf
SI = Speech impaired
VH = Visually handicapped
ED = Emotionally disturbed
OI = Orthopedically impaired
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reported composition of the handicapped population. Note, for instance, the wide variations in Table 33 in the percentages of handicapped pupils that different states classify as "mentally retarded." Whether these differences are real or merely reflect divergent state classification policies or reporting practices is an important question (discussed further later) bearing on the validity of weighted-pupil fund allocation formulas.

These interstate differences in the composition of the handicapped population are reflected in the computed pupil-weighting factors for each state, also shown in Tables 33 and 34. Each state's weighting factor is calculated according to the formula,

$$WTFACT = \frac{\Sigma[COUNT(i) \times WT(i)]}{\Sigma[COUNT(i)]},$$

where *COUNT(i)* is the number of handicapped pupils with handicapping condition *i* in the state in question; *WT(i)* is the relative weight assigned to handicapping condition *i* (the weights correspond to the excess cost ratios shown in Table 32); and the summation is over all the handicapping conditions. Thus states with high weighting factors have relatively large percentages of their handicapped pupils in the higher-cost categories.

Tables 33 and 34 present the weighting factors for each state and the corresponding weighted counts of handicapped children. Each weighting factor represents the ratio, in a particular state, of the average extra cost incurred per handicapped child to the average amount expended per "regular" (nonhandicapped) pupil. For example, a weighting factor of 0.9 for a state signifies that the average handicapped student in that state receives special educational services costing 0.9 times as much as the regular per-pupil cost of education (i.e., 90 percent more is spent on the average handicapped student in that state than on the average regular pupil). According to Table 33, the weighting factor for handicapped pupils served

under the EHA program ranges from 0.72 for the District of Columbia to 1.34 for Wisconsin (the latter appears to be an anomaly, as the next-highest value is 1.14 for Georgia). For pupils served under the Chapter 1 Handicapped program (Table 34), the weighting factor varies from 0.78 for Alaska (another anomaly--the next-lowest being 1.09 for Massachusetts) to 3.10 for New Mexico.[16] The reason that the weighting factors for children served in the Chapter 1 Handicapped program are generally much larger than those for children served in the EHA program (the national-average weights are 1.76 and 0.91, respectively) is that the state-operated programs supported with Chapter 1 Handicapped funds generally serve more severely handicapped pupils.

A state's weighted count of handicapped children is calculated by multiplying the state's unweighted count of the handicapped by the aforesaid state weighting factor. The unweighted counts are the same figures as those used in the current fund allocation formula to represent each state's relative need for financial aid. The weighted counts represent the estimated costs of serving each state's handicapped population, but with cost expressed in units equal to the state's average per-pupil expenditure. For example, a state with an unweighted pupil count of 300,000 and a weighting factor of 0.80 has a weighted pupil count of 240,000 (300,000 multiplied by 0.80), indicating that the estimated *extra* cost of serving handicapped pupils in the state is equal to the *full* cost of serving an additional 240,000 regular pupils. Both the unweighted and weighted counts are displayed in Tables 33 and 34.

Given the variation in the composition of the handicapped pupil population among the states, it is a foregone conclusion that fund allocations according to weighted-pupil formulas would differ significantly from allocations according to the current unweighted formulas. The general pattern would be, of course, a movement of funds toward states with above-average

percentages of handicapped children in the higher-cost categories. The specific effects of pupil weighting on the distribution of EHA Basic Grants are shown in the left-hand portion of Table 35 and also in Figure 13; the effects on allocations of Chapter 1 Grants for the Handicapped are shown in the right-hand half of Table 35. In the case of the EHA program, Wisconsin, Georgia, Massachusetts, and Utah (along with Puerto Rico) would enjoy the largest percentage increases in funding, while the District of Columbia, Oregon, and Mississippi would be among the major losers. Under the Chapter 1 Handicapped program, very large gains (40 percent or more) would be registered by Alabama, Idaho, Iowa, Maryland, Montana, New Mexico, South Dakota, and Utah, while substantial losses would be sustained by Alaska, the District of Columbia, and Massachusetts. In some instances, states that gain from pupil weighting under one program lose under the other. For instance, Massachusetts would gain from pupil weighting under the EHA program but lose under the Chapter 1 program, while the effects on California would be just the reverse. This is not unreasonable because states sometimes serve mixes of children in the state-operated programs aided with Chapter 1 Handicapped funds very different from the children served under the locally operated programs aided with EHA grants. There is no readily discernible geographical pattern to the results.

Would allocations based on weighted counts of the handicapped be preferable to the present unweighted allocations? In principle, there is a strong affirmative argument. Considering that it costs more to serve one deaf child than five learning disabled children, it seems unreasonable to count both types of children equally for the purpose of distributing federal aid. The fact that many states distribute their own special education aid to LEAs according to weighted-pupil formulas suggests that the same thing can and should be done in

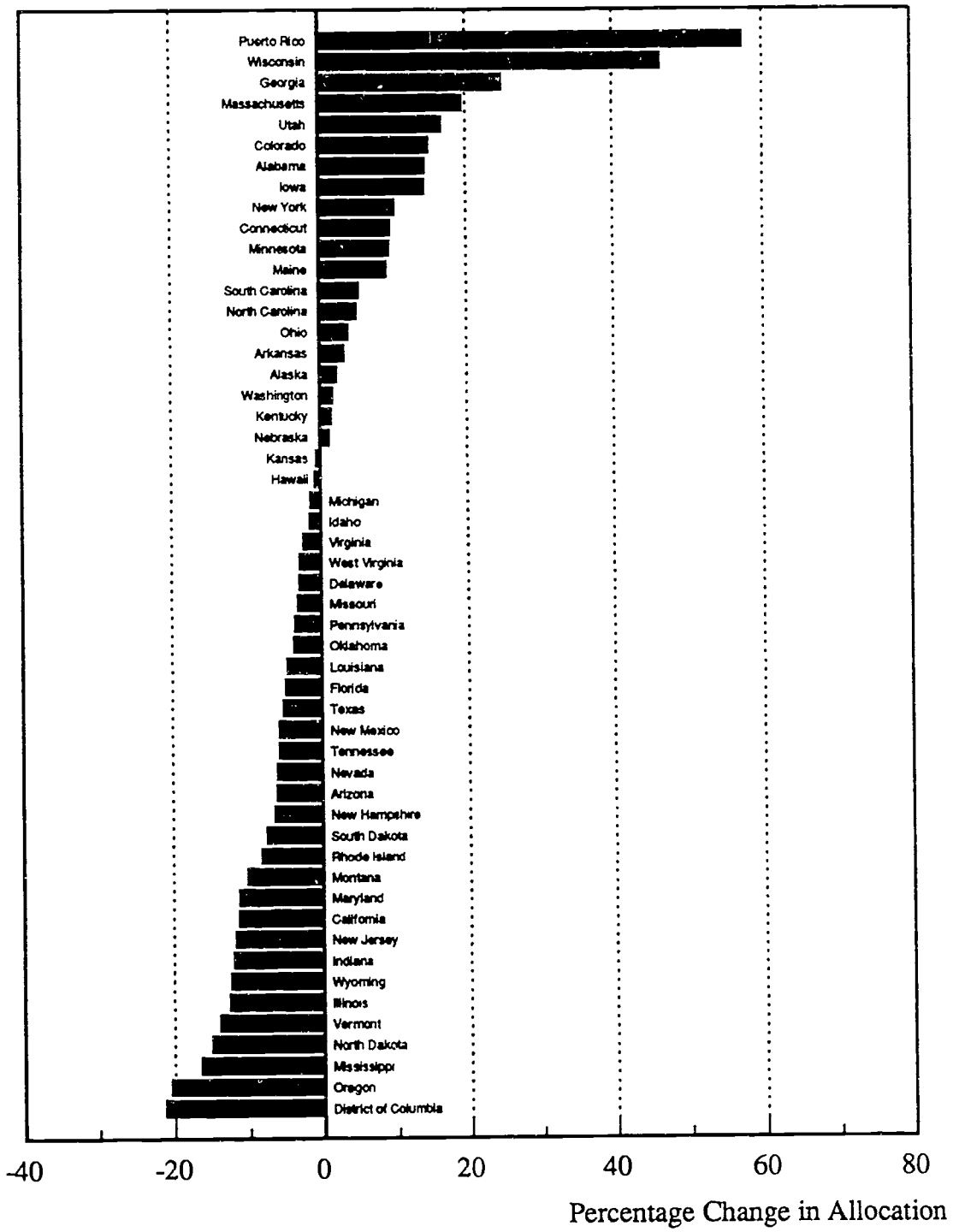
Table 35

Effects of Replacing Unweighted with Weighted Counts of Pupils on Allocations of EHA Basic Grants and Chapter 1 Grants for the Handicapped, Fiscal Year 1989
(Allocations in thousands of dollars)

State	EHA Basic Grants				Chapter 1 Grants for the Handicapped			
	Actual Allocation (Unweighted Counts)	Allocation with Weighted Counts	Difference	Percentage Change	Actual Allocation (Unweighted Counts)	Allocation with Weighted Counts	Difference	Percentage Change
Alabama	34,179	39,079	4900	14.3	281	454	174	61.8
Alaska	4,077	4,169	92	2.3	1,834	820	-1015	-55.3
Arizona	17,889	16,785	-1104	-6.2	702	722	19	2.8
Arkansas	14,735	15,220	485	3.3	1,466	1,613	148	10.1
California	142,603	126,541	-16062	-11.3	1,612	1,998	386	23.9
Colorado	16,117	18,511	2394	14.9	2,661	3,242	582	21.9
Connecticut	20,085	21,994	1909	9.5	2,961	2,605	-356	-12.0
Delaware	3,458	3,354	-104	-3.0	2,251	1,999	-252	-11.2
District of Columbia	991	781	-211	-21.3	2,702	2,023	-679	-25.1
Florida	66,660	63,434	-3226	-4.8	4,015	4,382	367	9.2
Georgia	30,326	37,879	7553	24.9	1,382	1,717	335	24.2
Hawaii	3,933	3,904	-30	-0.8	231	264	34	14.6
Idaho	6,423	6,326	-97	-1.5	85	132	48	56.3
Illinois	68,499	59,874	-8625	-12.6	22,389	20,965	-1424	-6.4
Indiana	33,504	29,481	-4023	-12.0	4,454	4,707	253	5.7
Iowa	18,730	21,404	2674	14.3	700	1,021	321	45.9
Kansas	13,690	13,620	-70	-0.5	1,394	1,751	357	25.6
Kentucky	24,368	24,723	355	1.5	1,494	1,745	250	16.8
Louisiana	21,721	20,723	-998	-4.6	1,783	2,063	280	15.7
Maine	9,026	9,837	811	9.0	611	687	76	12.4
Maryland	29,172	25,908	-3264	-11.2	1,258	1,786	528	41.9
Massachusetts	44,595	53,301	8706	19.5	10,653	6,636	-4017	-37.7
Michigan	49,898	49,220	-678	-1.4	8,009	8,255	246	3.1
Minnesota	27,037	29,570	2532	9.4	251	268	17	6.8
Mississippi	19,467	16,263	-3204	-16.5	380	508	128	33.8
Missouri	32,709	31,669	-1041	-3.2	1,178	1,250	71	6.1
Montana	5,022	4,514	-508	-10.1	428	638	210	49.0
Nebraska	10,385	10,513	127	1.2	150	136	-15	-9.9
Nevada	5,157	4,844	-312	-6.1	289	313	24	8.2
New Hampshire	5,551	5,194	-356	-6.4	546	576	30	5.5
New Jersey	56,260	49,691	-6569	-11.7	3,948	4,823	875	22.2
New Mexico	10,445	9,843	-602	-5.8	125	222	97	77.6
New York	86,437	95,195	8758	10.1	22,527	22,053	-474	-2.1
North Carolina	37,107	38,926	1819	4.9	1,180	1,276	97	8.2
North Dakota	4,004	3,403	-600	-15.0	329	425	96	29.2
Ohio	63,637	66,122	2485	3.9	4,700	6,315	1616	34.4
Oklahoma	21,094	20,315	-779	-3.7	408	543	135	33.1
Oregon	15,178	12,071	-3107	-20.5	4,811	4,774	-37	-0.8
Pennsylvania	63,479	61,216	-2263	-3.6	14,270	12,505	-1765	-12.4
Rhode Island	6,412	5,889	-523	-8.2	596	609	14	2.3
South Carolina	25,056	26,356	1301	5.2	419	493	74	17.7
South Dakota	4,643	4,295	-348	-7.5	214	330	116	54.2
Tennessee	33,579	31,627	-1952	-5.8	620	818	197	31.8
Texas	103,522	98,175	-5347	-5.2	6,174	6,195	22	0.4
Utah	13,754	16,038	2284	16.6	935	1,349	414	44.3
Vermont	3,393	2,922	-471	-13.9	1,638	1,409	-229	-14.0
Virginia	38,292	37,380	-912	-2.4	856	1,097	241	28.2
Washington	24,364	24,785	421	1.7	2,091	2,661	571	27.3
West Virginia	14,490	14,076	-414	-2.9	788	973	185	23.5
Wisconsin	25,519	37,371	11852	46.4	1,934	2,436	502	26.0
Wyoming	3,238	2,838	-400	-12.4	777	904	127	16.3
Puerto Rico	11,755	18,494	6,739	57.3	259	262	3	1.2
United States	1,445,668	1,445,668	0	0.0	147,749	147,749	0	0.0

Figure 13

Changes in Allocations of EHA Basic Grant Funds as a Result of Taking into Account the Differential Costs of Serving Pupils with Different Handicapping Conditions



the federal programs. But there is also a strong practical argument against changing to a weighted-pupil formula, or at least against doing so with the existing OSERS data--namely, that methods of classifying children by handicapping condition appear to be highly inconsistent among states and easily manipulable in response to fiscal incentives.

Evidence of inconsistency in state classification schemes abounds in Tables 33 and 34. Is it plausible, for instance (referring to Table 33), that the proportion of handicapped children who are mentally retarded varies from 11 percent in Florida and 16 percent in Mississippi to 32 percent in Alabama, or that this proportion is 8 percent in New York, 17 percent in Pennsylvania, but only three percent in New Jersey? A much more likely explanation is that these states have established very different criteria for identifying mentally retarded children. Likewise, is it believable that the proportion of handicapped children who are emotionally disturbed varies from one percent or less in Arkansas and Mississippi to 20 percent or more in Georgia or Utah? Or, to take perhaps the most egregious example, is it likely that 23 percent of Wisconsin's handicapped children are multiply handicapped, when no other state assigns more than 5 percent of its pupils to this category? Disparities of such magnitude leave little doubt that states are not interpreting or applying the federal taxonomy uniformly.

Federal aid under the EHA and Chapter 1 programs for the handicapped now depends on the total number of handicapped children but not the types of handicapped children that each state claims to be serving. There is no current federal incentive for states to tilt their statistical breakdowns by handicapping condition in any particular direction. The variations in state classification practices discussed above presumably reflect state-specific circumstances, state legal structures, and the designs of the states' own special education programs. But if a federal weighted-pupil formula of the type demonstrated earlier were adopted, the structure of

incentives would change dramatically. It would become profitable to assign handicapped children to the higher-cost, more heavily weighted categories. Each child who might formerly have been labeled learning disabled but who could instead be called mentally retarded or emotionally disturbed would represent a potential net financial gain.[17] Given the financial incentives, on one hand, and the apparent malleability of state classification practices, on the other, it is easy to see how abuses might occur.

Even in the absence of abuses, the evident inconsistencies in current state classifications of handicapped pupils raise doubts about whether pupil weighting would lead to a more rational distribution of federal funds. Whether pupil classification and data systems can be upgraded to reduce these problems is very much at issue. States do seem to be able to exert sufficient control over classification at the local level to make weighting schemes workable, but the federal government lacks the same authority over states that states can exercise over their local districts. Until these issues are resolved, and until appropriate controls are established to ensure that state breakdowns of children served by handicapping ondition will be consistent and valid, it seems premature to move to a weighted-pupil formula for allocating funds.

A note on the applicability of weighted-pupil formulas to other programs: The approach demonstrated here in connection with aid for the handicapped may also be applicable to other programs whose clientele have problems of varying severity. In the case of the Chapter 1 program of aid for the disadvantaged, for example, one way to take into account the severity as well as the incidence of poverty would be to assign differential weights to children from families in different poverty strata (e.g., progressively greater weights for children whose families fall below 100 percent, 75 percent, and 50 percent of the poverty line). Similarly,

under the Chapter 2 Block Grant program or the Mathematics and Science program, differential weights could be allowed for low-income children, children with limited English proficiency, and any other categories deemed to generate different needs for federally funded educational improvement activities. Some of the categories just mentioned, incidentally, would be much less manipulable than the classifications by handicapping condition. In general, differential weighting of pupils with different needs could become a standard feature of federal education aid formulas, just as it has in many state school finance systems. To be sure, there are significant problems of classification and measurement, such as those discussed in connection with the handicapped, but there is no reason to consider these insuperable.

Specificity of Need Indicators and Relatedness to Program Goals

Whether the need indicators in the federal formulas are sufficiently specific and closely enough related to program goals has to be judged in light of the purposes of each education aid program. The same indicator may be appropriate in one instance but unacceptably vague in another. For example, allocating aid according to a factor as broad as population 5-17 is easier to justify in the case of general-purpose Chapter 2 Block Grants, which seem to be directed at program improvement for the general school population, than in the case of the more specialized Drug-Free Schools grants. (Even in the case of Chapter 2, it can be argued that one purpose of federal aid is to help poor and other special-need pupils and consequently that more specific need indicators than school-age population should be included in the formula.)

Opportunities to make need indicators more specific and goal related vary from program to program, as they are highly dependent on whether pertinent data items happen to be available. Ideally, for example, it might be desirable to distribute Mathematics and Science

grants partly according to the degree to which each state's pupils fall short of certain standards of mathematics and science achievement, but that desire cannot be fulfilled with currently available data. Similarly, it might be reasonable to distribute Vocational Education funds according to measures of each state's demand for, or volume of, vocational education services rather than according to the present population factors, but no such data are now collected. The paucity of data prevents us from dealing with some of the most important instances in which indicators of need should be made more specific and congruent with program goals. All we can do here is illustrate some of the problems and possibilities. Specifically, the following subsections deal briefly with possibilities for improving the need indicators used in three grant programs: Drug-Free Schools grants, Migrant Education grants, and grants for Adult Education.

The Drug-Free Schools Program. Until recently, federal funds under the Drug-Free Schools program were distributed entirely according to school-age population, but as of FY 1990, half the available funds are given out to states in proportion to their Chapter 1 allocations. It seems preferable, in principle, to allocate such funds according to an indicator that reflects more directly the gravity of each state's drug problem, but no such indicator--nor even the conceptual foundation for such a measure--appears to be available. The practical question is whether there are any reasonable proxy measures, more closely related to the incidence and severity of drug problems than school-age population and Chapter 1 allocations, that could be incorporated into the funding formula. This analysis considers four such proxies: the incidence of poverty, the percentage of each state's population in metropolitan areas, the percentage of each state's population in cities, and the reported number of drug arrests.

Whether poverty is sufficiently related to the incidence of drug problems to be a useful formula factor seems to be a matter of some controversy. The image of poverty-ridden central-city ghettos comes immediately to the fore when drug problems are discussed--and with good reason--but poverty nationally is associated with the South and rural areas as well as with the big cities. As shown in the first columns of Table 36, inserting the incidence of poverty into the Drug-Free Schools formula would shift aid to some urban states (New York and the District of Columbia) and to most southern and some other rural states, but would affect other major urban states (California, Illinois, Massachusetts, Pennsylvania) either negatively or not at all.[18] In the absence of evidence that poverty per se is strongly associated with drug use or other drug-related problems, it is not clear that a poverty factor alone would improve the correlation between federal funding and educational needs.

The metropolitan and city population factors are relevant insofar as drug-related problems tend to be concentrated in urban areas. The degree of this concentration is unclear. Apparently, it depends on the specific drug problem (and even the specific drug) under discussion. Certainly, some of the more dramatic problems--drug-related violence, deaths from drug overdoses, and participation of young people in the more destructive facets of the drug trade--do seem to be concentrated in urban areas and in central cities, in particular.

The "metro population" and "city population" columns of Table 36 show what would happen if 50 percent of Drug-Free Schools funds were allocated according to the corresponding two population factors. The general effects would be, of course, to direct additional funds to the more urbanized states. Some of these states are the same ones that would gain from inclusion of poverty in the formula (e.g., New York and the District of Columbia), but others are states that would lose from a poverty adjustment (e.g., Maryland,

Table 36

Effects of Incorporating Alternative Need Indicators into the Drug-Free Schools Grant Formula, Fiscal Year, 1989
(Allocations in thousands of dollars)

State	Base-Case Allocation (Unconstrained Version of Formula)	Allocation of 50 Percent of Funds According to Population 5-17 and the Other 50 Percent According to:							
		Poverty Percentage		Metro Population		City Population		Drug Arrests	
		Allocation	Percentage Change	Allocation	Percentage Change	Allocation	Percentage Change	Allocation	Percentage Change
Alabama	5,061	6,387	26.2	4,653	-8.1	4,721	-6.7	3,954	-21.9
Alaska	690	604	-12.4	552	-20.0	842	22.1	491	-28.8
Arizona	3,891	3,974	2.1	3,891	0.0	5,243	34.8	4,068	4.6
Arkansas	2,924	3,652	24.9	2,214	-24.3	2,456	-16.0	2,332	-20.3
California	30,783	29,812	-3.2	34,741	12.9	34,142	10.9	48,456	57.4
Colorado	3,725	3,189	-14.4	3,848	3.3	3,980	6.8	3,194	-14.2
Connecticut	3,343	2,819	-15.7	3,703	10.8	3,512	5.1	4,269	27.7
Delaware	708	695	-1.8	665	-6.0	482	-31.9	578	-18.4
District of Columbia	554	758	36.8	643	16.1	1,157	108.7	1,473	165.8
Florida	11,648	12,607	8.2	12,820	10.1	11,365	-2.4	11,648	0.0
Georgia	7,751	9,113	17.6	7,124	-8.1	6,243	-19.5	8,325	7.4
Hawaii	1,213	1,075	-11.4	1,227	1.2	1,298	7.0	1,178	-2.9
Idaho	1,367	1,288	-5.8	854	-37.5	915	-33.0	960	-29.8
Illinois	13,385	12,918	-3.5	13,946	4.2	14,815	10.7	13,291	-0.7
Indiana	6,649	5,584	-16.0	6,305	-5.2	6,899	3.8	4,622	-30.5
Iowa	3,300	2,826	-14.4	2,575	-22.0	3,023	-8.4	2,013	-39.0
Kansas	2,820	2,405	-14.7	2,332	-17.3	2,693	-4.5	1,855	-34.2
Kentucky	4,544	5,450	19.9	3,636	-20.0	3,453	-24.0	4,544	0.0
Louisiana	5,726	7,226	26.2	5,475	-4.4	5,757	0.6	4,899	-14.4
Maine	1,354	1,352	-0.2	1,035	-23.6	966	-28.7	953	-29.7
Maryland	4,876	4,352	-10.7	5,434	11.5	4,013	-17.7	6,021	23.5
Massachusetts	5,830	5,281	-9.4	6,606	13.3	6,109	4.8	4,614	-20.9
Michigan	11,051	10,046	-9.1	11,386	3.0	9,958	-9.9	9,572	-13.4
Minnesota	4,851	3,946	-18.7	4,515	-6.9	4,134	-14.8	3,389	-30.1
Mississippi	3,571	5,362	50.2	2,477	-30.6	2,503	-29.9	2,463	-31.0
Missouri	5,787	5,566	-3.8	5,397	-6.8	5,157	-10.9	4,202	-27.4
Montana	985	905	-8.1	651	-33.9	737	-25.2	567	-42.5
Nebraska	1,859	1,641	-11.7	1,496	-19.6	1,874	0.8	1,342	-27.8
Nevada	1,084	878	-19.0	1,130	4.3	1,087	0.4	1,575	45.4
New Hampshire	1,170	928	-20.6	1,056	-9.8	1,045	-10.7	927	-20.8
New Jersey	8,114	7,618	-6.1	9,420	16.1	6,136	-24.4	11,592	42.9
New Mexico	1,921	2,336	21.6	1,551	-19.3	1,930	0.5	1,760	-8.4
New York	19,166	20,900	9.1	21,034	9.8	24,157	26.0	26,727	39.5
North Carolina	7,320	7,959	8.7	6,306	-13.9	6,129	-16.3	7,098	-3.0
North Dakota	813	782	-3.8	602	-25.9	703	-13.4	484	-40.4
Ohio	12,701	11,462	-9.8	12,969	2.1	12,201	-3.9	8,939	-29.6
Oklahoma	3,909	3,902	-0.2	3,448	-11.8	3,947	1.0	3,383	-13.5
Oregon	3,054	2,615	-14.4	2,881	-5.7	2,687	-12.0	3,074	0.7
Pennsylvania	12,732	11,910	-6.5	13,475	5.8	11,523	-9.5	9,252	-27.3
Rhode Island	1,010	925	-8.4	1,114	10.3	958	-5.1	1,051	4.1
South Carolina	4,217	4,983	18.2	3,779	-10.4	2,845	-32.5	4,397	4.3
South Dakota	850	969	14.0	519	-39.0	593	-30.2	450	-47.1
Tennessee	5,683	6,628	16.6	5,279	-7.1	6,035	6.2	4,083	-28.2
Texas	21,437	23,731	10.7	22,080	3.0	26,987	25.9	20,177	-5.9
Utah	2,740	2,256	-17.7	2,757	0.6	2,339	-14.6	2,310	-15.7
Vermont	622	578	-7.1	409	-34.3	382	-38.6	434	-30.3
Virginia	6,391	6,231	-2.5	6,196	-3.0	6,275	-1.8	5,534	-13.4
Washington	5,092	4,276	-16.0	5,261	3.3	4,776	-6.2	4,505	-11.5
West Virginia	2,296	2,527	10.0	1,701	-25.9	1,570	-31.6	1,318	-42.6
Wisconsin	5,621	4,591	-18.3	5,284	-6.0	5,660	0.7	4,038	-28.2
Wyoming	646	483	-25.3	386	-40.3	424	-34.5	456	-29.5
Puerto Rico	5,420	3,956	-27.0	5,420	0.0	5,420	0.0	5,420	0.0
United States	284,255	284,255	0.0	284,255	0.0	284,255	0.0	284,255	0.0

Massachusetts, and New Jersey). The more rural states, including most southern and western states, naturally lose from these urban-oriented adjustments. There are also some notable differences between the metro population and city population options. Alaska, for example, loses from the former and gains from the latter, but for Maryland and New Jersey the results are the opposite. Some states that would be adversely affected by an adjustment based on metro population remain almost untouched by one based on city population (e.g., New Mexico and Oklahoma); others that would be unaffected by a metro population adjustment gain from the city population factor (e.g., Arizona and Texas).

The last two columns of the table show the effects of treating reported drug arrests as an indicator of need. Like the adjustments for metropolitan and city population just discussed, this change would benefit certain highly urbanized states (e.g., New Jersey, New York, and the District of Columbia) while reducing aid to most southern and western states, but the results are unpredictable in some respects. California and Nevada, for example, would gain sharply from an allocation based partly on drug arrests, whereas they are much less affected by the inclusion of urban factors. The major shortcoming of a factor like drug arrests (or such related factors as drug convictions or drug-related incarcerations) is that it reflects state laws and enforcement policies at least as much as the underlying incidence of problems. Therefore, although an indicator based on drug arrests scores high by the criterion of relevance to the problem, it is of questionable validity as a formula factor.

The Migrant Education Program. Federal funds for migrant education are currently distributed to states mainly according to each state's number of eligible migrant children, as reported by states through the Migrant Student Record Transfer System (MSRTS).[19] This number of eligibles is considerably larger than the number of migrants actually served under

federally aided migrant education programs. Moreover, the class of eligibles includes not only children who are currently migrants but also "former migrants" who qualified as migrants at some time during the previous five years. Two obvious questions raised by the present formula factor are (1) whether the need for federal funding might be better represented by counts of migrants actually served than by counts of migrants eligible for services and (2) whether targeting might be improved by focusing on current migrants only rather than on current and former migrants combined.

Table 37 shows the effects of replacing the present count of eligible migrant children with alternative counts suggested by the foregoing questions--namely, counts of total migrants and current migrants actually served. It is immediately apparent that either option, but especially the latter, would cause drastic changes in the interstate distribution of Migrant Education funds. Recall that three states, California, Florida, and Texas, received nearly 60 percent of the total funds distributed under the Migrant Education formula in FY 1989. All three lose aid under these options in amounts sufficient to provide large percentage increases to a number of other states. Under the alternative of allocating only according to the number of current migrants served, some states would receive double or triple their current allocations. California, Florida, and Texas, in combination, would collect 50 percent rather than 60 percent of total program funds.

What is relevant here, however, is less the particular set of results than the extreme sensitivity of the distribution of aid to the definition of the need indicator. The logical arguments seem strong both for linking aid to the number of migrants actually served and for focusing on the current migrants (or at least giving current migrants greater weight than former migrants in the formula); however, there are also arguments to the contrary.[20] The

Table 37

Effects of Distributing Aid for Migrant Education According to Numbers of Children Reported as Actually Served Instead of According to Numbers Eligible, Fiscal Year 1989
(Allocations in thousands of dollars)

State	Actual FY 1989 Allocation	Distribution According to Total Migrant Children Served		Distribution According to Current Migrant Children Served	
		Allocation	Percentage Change	Allocation	Percentage Change
Alabama	1,821	1,725	-5.2	1,665	-8.6
Alaska	7,009	5,785	-17.5	7,278	3.8
Arizona	6,771	8,964	32.4	8,099	19.6
Arkansas	4,064	4,385	7.9	7,088	74.4
California	87,103	85,134	-2.3	71,210	-18.3
Colorado	2,337	2,589	10.8	2,922	25.0
Connecticut	2,277	3,757	65.0	1,924	-15.5
Delaware	678	474	-30.1	476	-29.8
District of Columbia	69	86	25.9	27	-60.5
Florida	23,173	14,580	-37.1	20,458	-11.7
Georgia	2,645	3,668	38.7	4,481	69.4
Hawaii	0	0	0.0	0	0.0
Idaho	3,243	2,952	-9.0	2,791	-13.9
Illinois	1,912	2,365	23.7	2,100	9.8
Indiana	908	2,509	176.5	4,386	383.3
Iowa	88	108	22.8	78	-11.9
Kansas	3,761	3,768	0.2	2,588	-31.2
Kentucky	1,879	1,762	-6.3	1,320	-29.8
Louisiana	3,566	3,681	3.2	2,106	-40.9
Maine	3,339	3,089	-7.5	2,255	-32.5
Maryland	398	654	64.5	974	144.8
Massachusetts	4,660	4,112	-11.8	1,258	-73.0
Michigan	9,151	11,906	30.1	17,422	90.4
Minnesota	1,905	3,118	63.7	5,815	205.3
Mississippi	1,943	2,493	28.3	1,648	-15.2
Missouri	782	1,078	37.8	856	9.5
Montana	345	653	89.1	1,303	277.2
Nebraska	391	547	40.0	1,013	159.3
Nevada	587	398	-32.2	2	-60.3
New Hampshire	112	111	-0.1		-41.3
New Jersey	1,773	2,162	21.9	1,254	-29.3
New Mexico	1,248	962	-22.9	629	-49.6
New York	5,769	5,946	3.1	6,089	5.6
North Carolina	2,484	3,001	20.8	2,911	17.2
North Dakota	606	1,009	66.6	1,950	222.0
Ohio	1,327	2,010	51.4	3,558	168.0
Oklahoma	992	1,023	3.2	1,010	1.8
Oregon	7,524	9,788	30.1	8,982	19.4
Pennsylvania	2,378	2,713	14.1	2,575	8.3
Rhode Island	129	75	-42.1	75	-41.5
South Carolina	278	446	60.1	859	208.4
South Dakota	59	28	-52.1	41	-30.5
Tennessee	176	230	30.2	218	23.6
Texas	45,152	40,001	-11.4	40,337	-10.7
Utah	658	664	1.0	604	-8.2
Vermont	708	739	4.4	334	-52.8
Virginia	371	669	80.3	1,124	203.1
Washington	11,484	10,969	-4.5	12,911	12.4
West Virginia	41	64	54.9	101	145.7
Wisconsin	785	1,118	42.4	1,527	94.6
Wyoming	268	471	75.6	900	235.8
Puerto Rico	2,758	3,344	21.2	2,055	-25.5
United States	263,883	263,883	0.0	263,883	0.0

point is that the choice of need indicators, in this instance, makes a real difference. Consequently, the issue of which indicator to use deserves more attention than it seems to have received.

The Adult Education Program. The Adult Education grant program provides an example of a minor definitional change that can improve the match between a formula factor and the stated purpose of federal financial aid. Under the law, Adult Education funds are allocated among states according to the number of persons in each state, age 16 and over, who have not completed high school. The data are derived from the decennial Census. Education Department officials have long been aware that this need indicator is irrational in one respect: among the persons age 16 and over counted for the purpose of apportioning funds are students still enrolled in high school. Such persons, naturally, are not potential clients for adult education, and including them in what should logically be a count of adults who have failed to earn a high school diploma distorts the need indicator. The obvious alternative is to redefine the indicator to exclude this group.

Using a special set of 1980 Census data compiled by NCES, we are able to show (in Table 38) how allocations would be changed by replacing the present need indicator in the Adult Education formula with the number of persons age 16 and over in each state who have not completed high school *less* the number of such persons, ages 16-19, who are still enrolled in school. The redistributive consequences, it turns out, are relatively minor. The general effect is that states that have relatively large numbers of high school students compared with their adult populations receive less aid because of the change, while states with relatively small fractions of their populations age 16 and over enrolled in high school receive some additional funds. Thus states like Colorado, Minnesota, and Utah lose 6 or 7 percent of their

Table 38

Effects of Modifying the Need Factor in the Adult Education Formula to Avoid Counting Persons Still in School, Fiscal Year 1989 (Allocations in thousands of dollars)

State	Actual FY 1989 Allocation	Allocation with Persons Still in School Eliminated	Difference	Percentage Change
Alabama	2,777	2,846	69	2.5
Alaska	378	362	-16	-4.3
Arizona	1,487	1,473	-14	-0.9
Arkansas	1,782	1,833	51	2.9
California	11,001	10,824	-176	-1.6
Colorado	1,343	1,265	-79	-5.9
Connecticut	1,773	1,733	-39	-2.2
Delaware	547	540	-7	-1.3
District of Columbia	605	610	5	0.8
Florida	5,631	5,831	200	3.5
Georgia	3,794	3,924	130	3.4
Hawaii	650	633	-17	-2.7
Idaho	648	630	-18	-2.8
Illinois	6,291	6,283	-7	-0.1
Indiana	3,135	3,106	-29	-0.9
Iowa	1,589	1,514	-75	-4.7
Kansas	1,289	1,256	-33	-2.6
Kentucky	2,787	2,931	144	5.2
Louisiana	2,839	2,903	65	2.3
Maine	815	797	-17	-2.1
Maryland	2,459	2,432	-27	-1.1
Massachusetts	2,877	2,783	-94	-3.3
Michigan	4,911	4,781	-131	-2.7
Minnesota	2,026	1,889	-137	-6.8
Mississippi	1,902	1,945	43	2.3
Missouri	3,056	3,085	29	1.0
Montana	584	560	-24	-4.1
Nebraska	924	883	-41	-4.5
Nevada	592	586	-5	-0.9
New Hampshire	667	654	-13	-1.9
New Jersey	4,119	4,077	-42	-1.0
New Mexico	886	873	-14	-1.5
New York	9,720	9,738	18	0.2
North Carolina	4,220	4,372	152	3.6
North Dakota	575	565	-10	-1.7
Ohio	5,870	5,764	-106	-1.8
Oklahoma	1,872	1,882	10	0.5
Oregon	1,354	1,323	-31	-2.3
Pennsylvania	6,785	6,851	66	1.0
Rhode Island	821	842	20	2.5
South Carolina	2,351	2,408	57	2.4
South Dakota	590	579	-12	-2.0
Tennessee	3,292	3,415	123	3.7
Texas	8,437	8,510	73	0.9
Utah	723	669	-54	-7.4
Vermont	484	475	-9	-1.9
Virginia	3,394	3,428	33	1.0
Washington	1,880	1,781	-100	-5.3
West Virginia	1,532	1,592	60	3.9
Wisconsin	2,514	2,417	-97	-3.9
Wyoming	425	414	-12	-2.7
Puerto Rico	2,775	2,913	138	5.0
United States	135,781	135,781	0	0.0

funding, while states like Florida, Kentucky, and West Virginia gain modest amounts. Arguably, the change makes the formula a bit more logical and consistent with the purpose of the program, but as a practical matter it would surely be more important to update the 1980 Census figures on which the formula still depends than to improve targeting slightly in this respect.

Summary

There is little disagreement that the need indicators in fund allocation formulas should be specific, related to program goals, and sensitive to the varying severity of educational problems, but data limitations leave relatively few opportunities to apply these principles in practice. Of necessity, the alternatives discussed here were chosen as much on the basis of data availability as on their intrinsic importance.

The most important (and interesting) option considered is to distribute federal aid for education of the handicapped according to formulas that take the varying severity of handicaps into account by assigning different weights to pupils with different handicapping conditions. Because the reported mix of pupils by handicapping condition varies significantly across states, weighted pupil counts that reflect the costs of dealing with different types of handicaps are not proportional to the unweighted counts on which allocations are now based. Consequently, fund allocations based on the need-weighted counts would differ substantially from the allocations according to the current formulas. But although the weighted-pupil approach is attractive in principle, the time is not ripe to adopt it in practice. There is strong evidence that methods of classifying handicapped children are inconsistent across states, making the weighted pupil counts suspect. Moreover, classification practices are manipulable

and could easily be distorted in the pursuit of federal aid. Therefore, it would be premature to switch to the weighted-pupil approach until measures to avoid these problems are developed.

The other alternatives examined, all aimed at making need indicators more specific or more congruent with program goals, include (1) distributing funds under the Drug-Free Schools program partly according to indicators of poverty, metropolitan population, city population, or numbers of reported drug arrests; (2) allocating Migrant Education grants according to numbers of pupils served rather than numbers eligible and according to numbers of current migrants rather than current and former migrants combined; and (3) revising the need indicator in the Adult Education formula to avoid counting persons still enrolled in high school.

INCORPORATING FISCAL CAPACITY FACTORS INTO AID ALLOCATION FORMULAS

The issue of the role that state fiscal capacity should play in distributing federal education aid is inescapable because of the Vocational Education precedent, but even in the absence of that example, there would still be at least three good reasons to consider options involving fiscal capacity adjustments. First, distributing aid in a negative relationship to fiscal capacity is virtually universal practice in state-local school finance, where its explicit purpose is to compensate for disparities in local ability to finance educational services. There is an obvious federal-state analog. Second, negative relationships between aid allocations and state or local fiscal capacity are built into some of the largest federal aid programs outside education, raising the question of whether the same approach should be taken in education as well.[21] Third, the proposition that intergovernmental aid should be distributed in a negative relationship to capacity to achieve certain equity goals has long been firmly established in the

fiscal federalism literature.[22] For all these reasons, we consider in some detail both whether and how fiscal capacity should be taken into account in distributing federal education funds.

The discussion is in three parts. The first part considers the effects of the per capita income factor in the Vocational Education formula and various ways in which that factor might be modified; the second part examines alternatives to per capita income as an indicator of state fiscal capacity (still in the framework of the Vocational Education formula); and the third part demonstrates, using the Chapter 2 Block Grant program as an example, the effects of incorporating different fiscal capacity adjustments into an aid formula that currently does not take fiscal capacity into account.

Existing and Alternative Methods of Adjusting for per Capita Income: The Vocational Education Example

Because fiscal capacity, represented by state per capita income, is already taken into account in the Vocational Education formula, that formula provides a convenient vehicle for comparing different technical specifications of a fiscal capacity factor. This part of the analysis covers (1) the overall effects of the current per capita income factor on the interstate distribution of Vocational Education funds, (2) the effects of changing the mathematical form of the income factor, and (3) the effects of modifying the strength of the adjustment by changing the parameter settings.

The Effects of the Current Per Capita Income Factor. The current Vocational Education formula, as explained in Chapter 2, incorporates a multiplicative, income-based adjustment factor with the mathematical form $1 - .5(PCI/USPCI)$, but constrained not to exceed 0.6 or fall below 0.4, where *PCI* is the per capita personal income of the state and *USPCI* is average per capita personal income in the nation. The value of this factor is 20

percent greater for the lowest-income state than for a state with per capita income equal to the U.S. average (i.e., 0.6, compared with 0.5) and 20 percent lower for the highest-income state than for a state with average per capita income (0.4, compared with 0.5). Other things being equal, the presence of the factor allows the lowest-income state to receive up to 50 percent more aid (relative to population, as counted in the formula) than the highest-income state (i.e., 0.6 is 50 percent more than 0.4). This effect is modified, however, by two formula constraints--the aid floor provision, which guarantees each state at least 1/2 of 1 percent of the available funds, and the hold-harmless provision based on each state's aid allocation in FY 1985. To isolate the effects of the income factor it is important to consider how the income factor affects the aid distribution both with and without these constraints in the formula.

Table 39 shows how allotments of Vocational Education aid are affected by the adjustment for per capita income in the presence and the absence of the aforesaid aid floor and hold-harmless provision. Naturally the effect in either case is to shift funds in favor of the lower-income recipients. The left-hand portion of the table shows that the income factor raises the allocations of each of the 10 lowest-income recipients (mainly southern states but also including New Mexico, Utah, and Puerto Rico) more than 18 percent, compared with what they would have received without such an adjustment, while reducing the allocations to the high-income states of California, Connecticut, Maryland, and New Jersey by amounts ranging from 14 to 21 percent.

The right-hand portion of the table shows that the effects of the per capita income adjustment would be accentuated in the absence of the formula constraints. Without the protection of the aid floor provision, for example, Alaska, New Hampshire, and the District of Columbia, would join the list of states that lose aid because of the income factor, while South

Table 39

Effects of Including the Per Capita Income Factor in the Vocational Education Formula, Fiscal Year, 1989
(Allocations in thousands of dollars)

State	Effects of Adding the Income Factor (Formula with 1/2 of 1 Percent Floor and Hold-Harmless Provision)				Effects of Adding the Income Factor (Formula with No 1/2 of 1 Percent Floor or Hold-Harmless Provision)			
	Allocation without Income Factor	Allocation with Income Factor	Difference	Percentage Change	Allocation without Income Factor	Allocation with Income Factor	Difference	Percentage Change
Alabama	13,831	16,375	2544	18.4	14,195	16,943	2748	19.4
Alaska	4,122	4,121	-1	0.0	1,801	1,434	-368	-20.4
Arizona	10,746	11,335	589	5.5	11,030	11,728	699	6.3
Arkansas	7,840	9,283	1442	18.4	8,047	9,605	1558	19.4
California	86,297	72,293	-14004	-16.2	88,570	74,801	-13769	-15.5
Colorado	10,596	10,125	-471	-4.4	10,875	10,477	-399	-3.7
Connecticut	10,405	8,224	-2180	-21.0	10,679	8,499	-2180	-20.4
Delaware	4,122	4,121	-1	0.0	2,194	2,044	-150	-6.9
District of Columbia	4,122	4,121	-1	0.0	1,899	1,512	-387	-20.4
Florida	35,314	34,735	-578	-1.6	36,244	35,940	-304	-0.8
Georgia	21,558	23,016	1458	6.8	22,126	23,814	1688	7.6
Hawaii	4,122	4,121	-1	0.0	3,619	3,581	-39	-1.1
Idaho	4,122	4,121	-1	0.0	3,340	3,986	646	19.3
Illinois	37,486	34,726	-2760	-7.4	38,473	35,930	-2543	-6.6
Indiana	18,540	20,169	1629	8.8	19,029	20,869	1840	9.7
Iowa	8,999	9,671	672	7.5	9,236	9,990	754	8.2
Kansas	7,681	7,670	-11	-0.1	7,883	7,936	53	0.7
Kentucky	12,616	14,937	2321	18.4	12,948	15,455	2507	19.4
Louisiana	15,002	17,762	2760	18.4	15,398	18,378	2981	19.4
Maine	4,122	4,378	256	6.2	4,064	4,530	466	11.5
Maryland	15,130	13,039	-2091	-13.8	15,529	12,970	-2559	-16.5
Massachusetts	19,159	17,324	-1835	-9.6	19,663	15,649	-4014	-20.4
Michigan	31,446	31,283	-163	-0.5	32,275	31,937	-338	-1.0
Minnesota	13,609	13,438	-171	-1.3	13,968	13,551	-417	-3.0
Mississippi	9,206	10,898	1692	18.4	9,448	11,276	1827	19.3
Missouri	16,245	16,877	632	3.9	16,673	17,375	702	4.2
Montana	4,122	4,121	-1	0.0	2,605	3,109	504	19.4
Nebraska	5,022	5,305	283	5.6	5,155	5,489	334	6.5
Nevada	4,122	4,121	-1	0.0	3,137	2,943	-194	-6.2
New Hampshire	4,122	4,121	-1	0.0	3,615	3,162	-454	-12.5
New Jersey	24,926	19,677	-5249	-21.1	25,582	20,359	-5223	-20.4
New Mexico	4,994	5,913	919	18.4	5,125	6,118	992	19.4
New York	57,524	51,362	-6162	-10.7	59,039	49,880	-9159	-15.5
North Carolina	21,863	24,799	2936	13.4	22,439	25,659	3220	14.4
North Dakota	4,122	4,121	-1	0.0	2,170	2,483	313	14.4
Ohio	35,488	36,841	1353	3.8	36,423	38,119	1697	4.7
Oklahoma	10,520	12,045	1526	14.5	10,797	12,463	1666	15.4
Oregon	8,338	8,990	652	7.8	8,557	9,301	744	8.7
Pennsylvania	38,102	38,550	449	1.2	39,105	39,711	606	1.5
Rhode Island	4,122	4,121	-1	0.0	3,272	3,261	-11	-0.3
South Carolina	11,892	14,080	2188	18.4	12,206	14,569	2363	19.4
South Dakota	4,122	4,121	-1	0.0	2,286	2,719	433	19.0
Tennessee	16,103	18,726	2623	16.3	16,527	19,376	2849	17.2
Texas	55,667	58,865	3198	5.7	57,133	60,907	3774	6.6
Utah	5,605	6,635	1030	18.4	5,753	6,866	1113	19.3
Vermont	4,122	4,121	-1	0.0	1,914	2,076	162	8.5
Virginia	19,954	18,603	-1351	-6.8	20,480	19,248	-1232	-6.0
Washington	14,355	13,990	-365	-2.5	14,733	14,475	-257	-1.7
West Virginia	6,318	7,480	1162	18.4	6,485	7,740	1255	19.4
Wisconsin	15,674	16,349	675	4.3	16,087	16,781	695	4.3
Wyoming	4,122	4,121	-1	0.0	1,592	1,790	198	12.4
Puerto Rico	12,549	14,850	2301	18.3	12,879	15,365	2486	19.3
Other Territories	1,300	1,408	108	8.3	1,300	1,423	123	9.5
United States	825,600	825,600	0	0.0	825,600	825,600	0	0.0

Dakota and Montana would joint the gainers. Also, New York and Massachusetts would suffer stronger negative effects from the presence of the income factor if they were deprived of the protection of the formula's hold-harmless provision. The pattern of gains and losses is depicted in Figure 14. Note that all the states in the cluster at the top of the diagram have exactly the same percentage gains, and several states at the bottom have exactly the same percentage losses. This pattern is due, of course, to the 0.4 to 0.6 limits on permissible values of the per capita income factor. In the aggregate, adding the income factor would shift about $44 million among the states (5.3 percent of all Vocational Education aid) if there were no constraints to moderate the effects. With the constraints in place, the total amount shifted is $23 million, or 2.7 percent of total Vocational Education funds.

Changing the Way in Which per Capita Income Is Taken into Account. The effects of the per capita income factor depend on the way in which that factor is incorporated into the aid formula. It is important to consider, therefore, how the effects would differ if the adjustment were made differently. Three features of the present adjustment method merit examination: (1) that the adjustment factor cannot exceed 0.6 or fall below 0.4, (2) that the adjustment takes the specific mathematical form $1 - k(PCI/USPCI)$, and (3) that the parameter k in this mathematical expression is set at the particular value of 0.5.

Table 40 deals with the first two of these features. The left-hand portion of the table shows that the 0.4 and 0.6 limits affect only a handful of states. The state most adversely affected is Mississippi, for which the unbounded income factor would be 0.668 and which would receive 10 percent more aid under the present formula if the limits were deleted (11 percent if there were no hold-harmless provision). A few other states (Arkansas, Utah, West Virginia) would gain between 3 and 6 percent.[23] With the hold-harmless provision in place,

Figure 14

Changes in Allocations as a Result of Including the per Capita Income Factor in the Vocational Education Formula

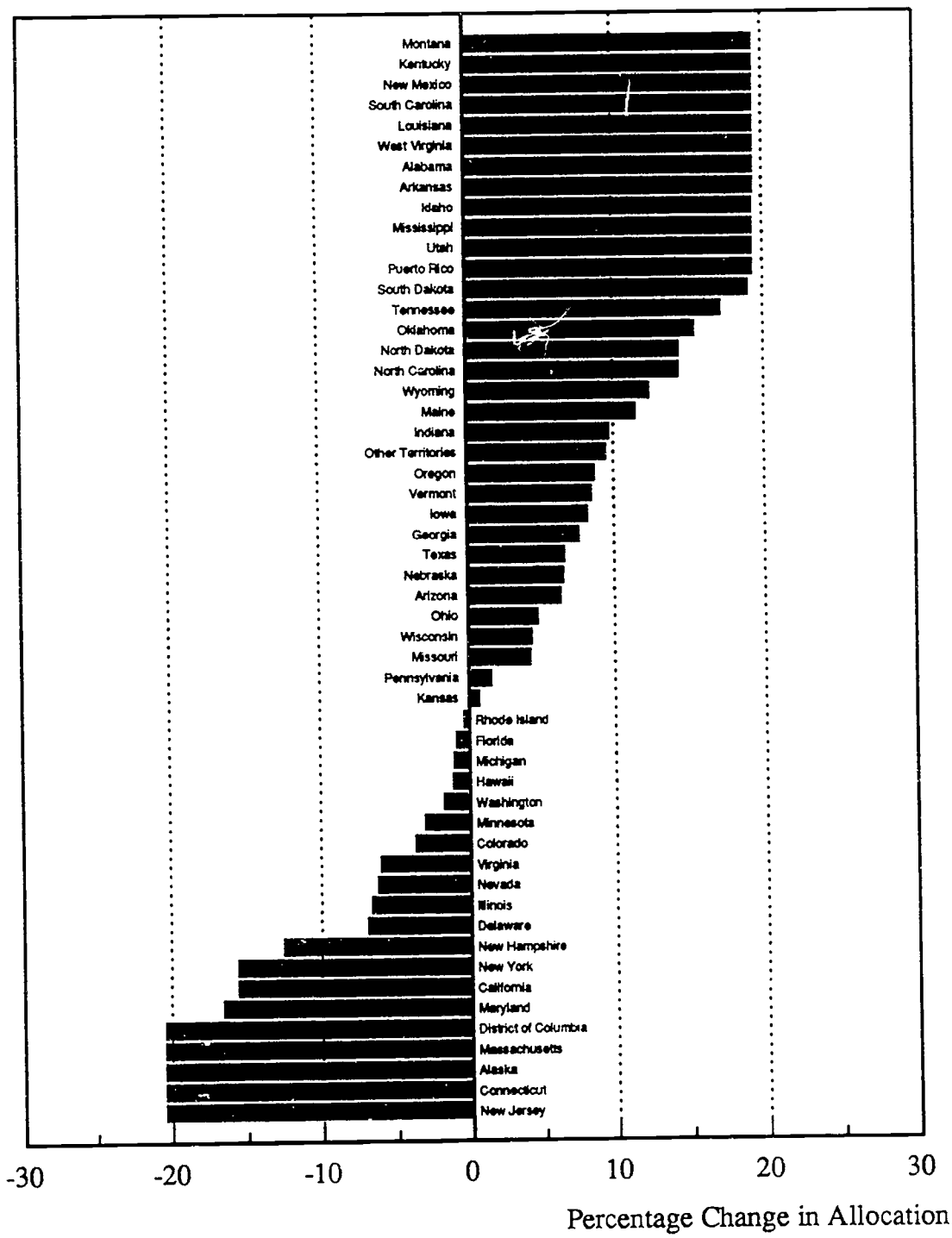


Table 40

Effects of Changing the Mathematical Form of the
Income Factor in the Vocational Education Formula, Fiscal Year 1989
(Allocations in thousands of dollars)

State	Effects of Deleting the .4 and .6 Bounds (Illustration without Hold-Harmless Rule)				Effects of Shifting to a Simple Inverse Income Factor (Illustration without Hold-Harmless Rule and .4 to .6 Bounds)			
	Allocation with .4-.6 Bounds	Allocation without .4-.6 Bounds	Difference	Percentage Change	Allocation with Present Income Factor	Allocation with Inverse Income Factor	Difference	Percentage Change
Alabama	16,525	16,875	350	2.1	16,525	17,382	857	5.2
Alaska	4,121	4,120	-1	0.0	4,121	4,120	-1	0.0
Arizona	11,439	11,412	-27	-0.2	11,439	11,196	-244	-2.1
Arkansas	9,368	9,722	355	3.8	9,368	10,117	749	8.0
California	72,957	72,786	-172	-0.2	72,957	72,728	-229	-0.3
Colorado	10,218	10,194	-24	-0.2	10,218	9,963	-255	-2.5
Connecticut	8,289	6,800	-1489	-18.0	8,289	7,520	-769	-9.3
Delaware	4,121	4,120	-1	0.0	4,121	4,120	-1	0.0
District of Columbia	4,121	4,120	-1	0.0	4,121	4,120	-1	0.0
Florida	35,054	34,972	-82	-0.2	35,054	34,147	-908	-2.6
Georgia	23,227	23,171	-56	-0.2	23,227	22,776	-451	-1.9
Hawaii	4,121	4,120	-1	0.0	4,121	4,120	-1	0.0
Idaho	4,121	4,120	-1	0.0	4,121	4,120	-1	0.0
Illinois	35,045	34,961	-84	-0.2	35,045	34,263	-782	-2.2
Indiana	20,354	20,306	-49	-0.2	20,354	20,036	-318	-1.6
Iowa	9,744	9,720	-23	-0.2	9,744	9,563	-180	-1.8
Kansas	7,741	7,722	-18	-0.2	7,741	7,541	-200	-2.6
Kentucky	15,074	15,347	272	1.8	15,074	15,780	706	4.7
Louisiana	17,925	18,285	360	2.0	17,925	18,822	897	5.0
Maine	4,418	4,407	-11	-0.2	4,418	4,367	-51	-1.2
Maryland	12,650	12,620	-30	-0.2	12,650	12,648	-3	0.0
Massachusetts	15,264	15,096	-168	-1.1	15,264	15,399	135	0.9
Michigan	31,150	31,075	-75	-0.2	31,150	30,341	-810	-2.6
Minnesota	13,217	13,185	-31	-0.2	13,217	12,881	-335	-2.5
Mississippi	10,998	12,216	1219	11.1	10,998	13,447	2449	22.3
Missouri	16,947	16,906	-40	-0.2	16,947	16,544	-403	-2.4
Montana	4,121	4,120	-1	0.0	4,121	4,120	-1	0.0
Nebraska	5,354	5,341	-13	-0.2	5,354	5,241	-113	-2.1
Nevada	4,121	4,120	-1	0.0	4,121	4,120	-1	0.0
New Hampshire	4,121	4,120	-1	0.0	4,121	4,120	-1	0.0
New Jersey	19,858	17,562	-2295	-11.6	19,858	18,731	-1126	-5.7
New Mexico	5,967	6,026	59	1.0	5,967	6,168	201	3.4
New York	48,651	48,535	-115	-0.2	48,651	48,490	-161	-0.3
North Carolina	25,027	24,967	-60	-0.2	25,027	24,934	-92	-0.4
North Dakota	4,121	4,120	-1	0.0	4,121	4,120	-1	0.0
Ohio	37,180	37,090	-89	-0.2	37,180	36,312	-868	-2.3
Oklahoma	12,156	12,127	-29	-0.2	12,156	12,153	-3	0.0
Oregon	9,072	9,051	-21	-0.2	9,072	8,913	-159	-1.8
Pennsylvania	38,732	38,640	-92	-0.2	38,732	37,743	-989	-2.6
Rhode Island	4,121	4,120	-1	0.0	4,121	4,120	-1	0.0
South Carolina	14,210	14,487	278	2.0	14,210	14,909	699	4.9
South Dakota	4,121	4,120	-1	0.0	4,121	4,120	-1	0.0
Tennessee	18,898	18,853	-45	-0.2	18,898	19,014	115	0.6
Texas	59,406	59,263	-143	-0.2	59,406	58,160	-1245	-2.1
Utah	6,696	6,960	263	3.9	6,696	7,249	552	8.2
Vermont	4,121	4,120	-1	0.0	4,121	4,120	-1	0.0
Virginia	18,774	18,729	-45	-0.2	18,774	18,342	-431	-2.3
Washington	14,119	14,085	-33	-0.2	14,119	13,754	-364	-2.6
West Virginia	7,549	8,027	478	6.3	7,549	8,499	950	12.6
Wisconsin	16,368	16,329	-39	-0.2	16,368	15,980	-387	-2.4
Wyoming	4,121	4,120	-1	0.0	4,121	4,120	-1	0.0
Puerto Rico	14,986	16,645	1659	11.1	14,986	18,321	3335	22.3
Other Territories	1,423	1,538	116	8.1	1,423	1,670	248	17.4
United States	825,600	825,600	0	0.0	825,600	825,600	0	0.0

the most that any state would lose from deletion of the 0.4 to 0.6 limits is 1.5 percent (New Jersey), but without that provision, the potential losses would range up to 12 percent for New Jersey and 18 percent for Connecticut. The reason that most other states would be virtually unaffected is that the unconstrained values of their income factors already fall within, or very close to, the permissible range. Only four states would have unconstrained income factors greater than 0.62, and only four would have factors below 0.38.[24]

The significance of the functional form $1 - .5(PCI/USPCI)$ is brought out in the right-hand portion of Table 40 by comparing the actual allocations with those that would be produced if the adjustment for per capita income were made simply by multiplying the formula's population factor by inverse relative income, *USPCI/PCI*. With the 0.4 to 0.6 limits in place, the effects of this change in functional form (not shown in the table) would be minor; no state's allotment would change by as much as 2 percent. Without the bounds (and with no hold-harmless provision to prevent funds from shifting), the effects would still be minor in most instances, but some of the lowest-income states would gain substantially. Mississippi and Puerto Rico would each receive 22 percent more aid; West Virginia would receive 13 percent more; Arkansas and Utah would receive 8 percent more; and several others would gain by about 5 percent if the current factor were replaced with the simple multiplicative form. The largest offsetting losses would be 9.3 percent in Connecticut and 5.7 percent in New Jersey (several other high-income states would be protected by the 1/2 of 1 percent floor).

An attribute of the formula that affects the aid distribution much more strongly than the features just discussed is that the parameter k in the expression $1 - k(PCI/USPCI)$ is set at 0.5 rather than at some lower or higher value. Before looking at the effects of changing this

parameter, consider the role that it plays in the allocation process. Under the current formula, a state with per capita income equal to the U.S. average receives the U.S.-average amount of aid per capita, while states with greater or lesser per capita incomes receive smaller or larger amounts of aid per capita, respectively, according to the (abbreviated) schedule shown in Table 41:

Table 41

Per Capita Aid versus per Capita Income Under the Existing Formula (Parameter = 0.5)

State per Capita Income Relative to U.S. per Capita Income	Aid per Capita Relative to U.S.-Average Aid per Capita
.50	1.50
.75	1.25
1.00	1.00
1.25	.75
1.50	.50

In comparison, resetting the formula parameter to, say, 0.6 would result in the substantially altered schedule shown in Table 42 (assuming no upper or lower bounds on permissible values of the per capita income factor).

As can be seen, raising the parameter setting above 0.5 tilts the distribution of aid significantly in favor of lower-income states and reduces allocations to the highest-income states drastically. The higher the parameter setting, the sharper the tilt. Conversely, setting the parameter value lower than 0.5 would reduce the degree to which the formula favors

Table 42

Per Capita Aid versus per Capita Income with the Income-Factor Parameter Reset to 0.6

State per Capita Income Relative to U.S. per Capita Income	Aid per Capita Relative to U.S.-Average Aid per Capita
.50	1.75
.75	1.38
1.00	1.00
1.25	.63
1.50	.25

lower-income states. Table 43 illustrates the effects on the aid distribution by comparing distributions under a formula with the current parameter setting, 0.5, against distributions corresponding to the reduced parameter setting of 0.4 and the higher settings of 0.6, 0.7, and 0.8. (To allow the full potential effects to emerge, these comparisons are made with an unconstrained version of the formula, with no lower bounds, hold-harmless provisions, or limits of .4 to .6 on the income factor.)

It is apparent from the table that the interstate distribution is highly sensitive to the setting of the formula parameter. Resetting the parameter value to 0.6 would reduce grants to some of the highest-income states (Connecticut, New Jersey, and the District of Columbia) by more than 20 percent, while increasing allocations to the lowest-income states by up to 12 percent. Changing the setting to 0.7 would more than double these effects: the richest states would lose 50 to 70 percent of their Vocational Education funds; the poorest would receive up to 25 percent more. Raising the setting still higher, say, to 0.8, would reduce the allocations

Table 43

Effects of Alternative Settings of the Income Factor Parameter in the Vocational Education Formula: Illustration Based on an Unconstrained Formula (Allocations in thousands of dollars)

State	Parameter = 0.4		Base Case: Parameter = 0.5	Parameter = 0.6		Parameter = 0.7		Parameter = 0.8	
	Allocation	Percentage Change from Base Case	Allocation	Allocation	Percentage Change from Base Case	Allocation	Percentage Change from Base Case	Allocation	Percentage Change from Base Case
Alabama	16,275	-6.0	17,307	18,844	8.9	21,443	23.9	23,389	35.1
Alaska	1,484	11.9	1,327	1,092	-17.7	706	-46.8	0	-100.0
Arizona	11,481	-1.9	11,704	12,037	2.8	12,623	7.9	14,247	21.7
Arkansas	9,333	-6.4	9,971	10,922	9.5	12,527	25.6	13,281	33.2
California	79,268	6.2	74,648	67,759	-9.2	56,547	-24.2	35,485	-52.5
Colorado	10,595	1.3	10,455	10,247	-2.0	9,931	-5.0	9,619	-8.0
Connecticut	8,203	17.6	6,974	5,142	-26.3	2,123	-69.6	0	-100.0
Delaware	2,091	2.5	2,040	1,963	-3.8	1,842	-9.7	1,656	-18.8
District of Columbia	1,515	14.4	1,324	1,040	-21.5	571	-56.9	0	-100.0
Florida	35,993	0.3	35,867	35,679	-0.5	35,470	-1.1	36,234	1.0
Georgia	23,221	-2.3	23,764	24,573	3.4	25,982	9.3	29,740	25.1
Hawaii	3,589	0.4	3,573	3,550	-0.6	3,523	-1.4	3,584	0.3
Idaho	3,833	-6.0	4,077	4,442	8.9	5,057	24.0	5,976	46.6
Illinois	36,725	2.4	35,856	34,560	-3.6	32,514	-9.3	29,419	-18.0
Indiana	20,230	-2.9	20,825	21,713	4.3	23,243	11.6	27,158	30.4
Iowa	9,726	-2.4	9,969	10,331	3.6	10,960	9.9	12,615	26.5
Kansas	7,908	-0.2	7,920	7,938	0.2	7,990	0.9	8,366	5.6
Kentucky	14,814	-5.9	15,739	17,119	8.8	19,450	23.6	21,643	37.5
Louisiana	17,640	-5.9	18,753	20,411	8.8	23,214	23.8	26,575	41.7
Maine	4,369	-3.3	4,520	4,746	5.0	5,133	13.5	6,097	34.9
Maryland	13,801	6.6	12,943	11,664	-9.9	9,580	-26.0	5,634	-56.5
Massachusetts	16,870	9.0	15,483	13,414	-13.4	10,029	-35.2	3,433	-77.8
Michigan	32,005	0.4	31,870	31,669	-0.6	31,427	-1.4	31,987	0.4
Minnesota	13,670	1.1	13,523	13,302	-1.6	12,975	-4.1	12,741	-5.8
Mississippi	11,508	-8.2	12,529	14,051	12.1	15,725	25.5	15,725	25.5
Missouri	17,119	-1.3	17,339	17,668	1.9	18,262	5.3	20,093	15.9
Montana	2,941	-5.4	3,108	3,357	8.0	3,778	21.6	4,768	53.4
Nebraska	5,371	-2.0	5,478	5,637	2.9	5,917	8.0	6,690	22.1
Nevada	3,003	2.3	2,937	2,838	-3.4	2,683	-8.7	2,454	-16.4
New Hampshire	3,308	4.8	3,155	2,927	-7.2	2,559	-18.9	1,891	-40.1
New Jersey	20,523	13.9	18,012	14,267	-20.8	8,110	-55.0	0	-100.0
New Mexico	5,830	-5.7	6,180	6,701	8.4	7,583	22.7	8,427	36.4
New York	52,850	6.2	49,777	45,195	-9.2	37,739	-24.2	23,741	-52.3
North Carolina	24,555	-4.1	25,606	27,171	6.1	29,838	16.5	35,520	38.7
North Dakota	2,376	-4.1	2,478	2,630	6.1	2,890	16.6	3,518	42.0
Ohio	37,504	-1.4	38,040	38,838	2.1	40,270	5.9	44,554	17.1
Oklahoma	11,893	-4.4	12,437	13,248	6.5	14,628	17.6	17,213	38.4
Oregon	9,042	-2.6	9,282	9,641	3.9	10,261	10.5	11,877	28.0
Pennsylvania	39,456	-0.4	39,629	39,887	0.6	40,427	2.0	42,891	8.2
Rhode Island	3,260	0.2	3,254	3,245	-0.3	3,239	-0.5	3,336	2.5
South Carolina	13,979	-5.9	14,858	16,169	8.8	18,385	23.7	19,964	34.4
South Dakota	2,572	-5.2	2,713	2,925	7.8	3,283	21.0	4,126	52.1
Tennessee	18,404	-4.8	19,336	20,724	7.2	23,080	19.4	26,861	38.9
Texas	59,571	-2.0	60,780	62,580	3.0	65,739	8.2	74,414	22.4
Utah	6,679	-6.4	7,138	7,822	9.6	8,976	25.8	9,220	29.2
Vermont	2,019	-2.5	2,071	2,149	3.8	2,284	10.3	2,638	27.3
Virginia	19,630	2.2	19,208	18,579	-3.3	17,590	-8.4	16,156	-15.9
Washington	14,541	0.7	14,446	14,303	-1.0	14,108	-2.3	14,182	-1.8
West Virginia	7,653	-7.0	8,233	9,097	10.5	10,552	28.2	10,921	32.7
Wisconsin	16,528	-1.3	16,747	17,072	1.9	17,660	5.5	19,457	16.2
Wyoming	1,722	-3.6	1,786	1,882	5.4	2,046	14.6	2,451	37.2
Puerto Rico	15,682	-8.1	17,071	19,141	12.1	21,161	24.0	21,161	24.0
Other Territories	1,444	-6.1	1,538	1,698	10.4	1,967	27.8	2,471	60.6
	$25,600	0.0	$25,600	$25,600	0.0	$25,600	0.0	$25,600	0.0

of the highest-income states to zero.[25] These results make clear that the adjustment factor $1 - k(PCI/USPCI)$ could be a flexible and powerful instrument for controlling the redistributive effects of the formula. It can be calibrated, by changing the value of k, to produce any desired degree of fiscal equalization among states. The current adjustment factor ($k = 0.5$) tilts the distribution of aid moderately in favor of the lower-income states, but the tilt could be doubled or tripled by substituting a higher setting. The same mechanism could, of course, be used in other aid programs to establish whatever relationship between aid and fiscal capacity policymakers might deem appropriate.

Alternative Fiscal Capacity Measures

The alternatives discussed thus far have all retained per capita income as the indicator of fiscal capacity. As is well known to experts on intergovernmental finance, however, per capita income is a seriously flawed capacity measure. This part of the analysis examines the effects of switching from per capita income to each of several alternative indicators of capacity. We first review briefly both the shortcomings of per capita income and the strengths and weaknesses of other methods of quantifying fiscal capacity.[26]

Shortcomings of per Capita Income. An index of state fiscal capacity is supposed to reflect the relative ability of each state to generate revenue to support the activities of its public (state and local government) sector. Ideally, such an index should take into account the full range of economic activities and resources from which revenue (both tax and nontax) may be extracted. Per capita personal income, it is generally agreed, falls short of being a valid measure in two major respects. First, it is not sufficiently comprehensive; it leaves out, among other things, much corporate income and many kinds of income earned from property. Second and more important, it reflects only a state's ability to derive revenue from its own

residents' incomes and not the ability to raise revenue from taxes and fees imposed on nonresidents. The latter ability arises from opportunities to tax various forms of interstate commerce--for instance, oil, gas, and coal extraction; tourism; gambling; other sales and services to nonresidents; and earnings of workers who commute from other states. Because these opportunities to "export" taxes to nonresidents are distributed very unevenly among the states, an index that neglects them yields a distorted picture of interstate differences in fiscal capacity.[27] These conceptual shortcomings of per capita income manifest themselves as underestimates of the fiscal capacities of states that have unusually favorable opportunities to shift their taxes to nonresidents or above-average amounts of property income and corporate income per capita and as overestimates of the capacities of states with the opposite characteristics. Most significantly, the true fiscal capacities of energy-producing states such as Alaska, Louisiana, Oklahoma, Texas, and Wyoming and of other high-tax-exporting states such as Delaware, Hawaii, Nevada, and the District of Columbia are clearly greater than a per capita income index implies.[28]

Indicators Other than Income. Much has been written about measurement of state fiscal capacity over the years, and a number of alternatives to the per capita income indicator have been proposed, demonstrated, and evaluated.[29] Some that are attractive in principle unfortunately are not available for practical use, as their development has been impeded by methodological and data limitations. For instance, Barro (1985, 1986) argues that a broadened per capita income index adjusted to reflect interstate variations in tax exportation rates would be an excellent capacity indicator, but a practical version of such an index cannot be produced for lack of satisfactory data on rates of tax exportation. Similarly, capacity indices derived from econometric models of the determinants of state-local fiscal behavior have much to

recommend them in theory, but no econometric models good enough to yield usable indices have yet been constructed. Nevertheless, several practical alternatives to per capita income are available. One is an index of per capita gross state product (GSP), based on GSP data produced by the Bureau of Economic Analysis (BEA) in the Department of Commerce. A second is an indicator known as Total Taxable Resources (TTR), produced by the Treasury Department, which is basically a composite of the income and GSP measures. Two others are the Representative Tax System (RTS) and Representative Revenue System (RRS) capacity indices, both produced by the Advisory Commission on Intergovernmental Relations (ACIR).

Gross state product (or, more precisely, gross state domestic product) is the total value of goods and services produced within a state. It differs from, and is more comprehensive than, personal income in that it reflects the total value of a state's economic output, regardless of whether the income generated by that output is received by individuals or businesses or by residents or nonresidents of the state. It is less comprehensive, however, in that it does not count income earned by a state's residents from economic activities undertaken outside the state's boundaries. Although an index of per capita GSP does not take explicit account of the states' varying abilities to export taxes, it provides better coverage than a per capita income measure of activities, such as energy production, that generate revenue from nonresidents. If anything, it may overstate the potential contributions of such activities to state revenue, thereby exaggerating the fiscal capacities of energy-producing and other high-tax-exporting states.

The Total Taxable Resource index shares the advantages of the GSP index but also includes certain components of resident personal income that the GSP index omits. As such, it represents a compromise between the per capita income and GSP measures and may be

preferable to either of the other indicators alone. There are unresolved issues concerning the technical features of the TTR indicator (e.g., whether it assigns appropriate weights to different income components), but these need not be pursued here.

The ACIR's Representative Tax System and Representative Revenue System indices, unlike the income and GSP measures, are not indices of the underlying economic resources from which states can draw revenue but rather indices of statutory revenue bases or, as ACIR describes them, indices of the yield of a standard tax or revenue structure. Specifically, the RTS index measures the relative revenue per capita that each state would raise if it taxed each of its tax bases (defined and measured in a standard, nationally uniform way) at national-average tax rates. The RRS index is similar, except that it takes into account not only the taxes but also the nontax revenue states would raise if they drew on their nontax revenue sources (e.g., user fees) at national-average rates.

The RTS and RRS capacity indices have many proponents and have frequently been proposed but never accepted for use in federal fund allocation formulas; the RTS method, however, also has major theoretical flaws that translate into misestimates of the capacities of states with certain characteristics. The main advantage of an RTS type of index is that it reflects a state's ability to raise taxes from nonresidents. In consequence, the RTS does a better job than a per capita income index of representing the capacities of energy-producing and other high-tax-exporting states. The main theoretical criticisms of the RTS approach, briefly stated, are that (1) it improperly allows interstate variations in resource-use patterns and fiscal choices, as opposed to variations in income or wealth, to influence the capacity measure; (2) it systematically underestimates the capacities of states that devote above-average percentages of their resources to the public sector rather than to private consumption; and (3)

it fails to recognize that the ability to raise all forms of revenue ultimately depends on state income and wealth, and consequently that such revenue sources as the sales tax base do not represent independent additions to revenue-raising ability.[30] Barro (1985) has shown that these theoretical defects have important empirical consequences. The RTS method tends to underestimate the capacities of populous northeastern states and exaggerates the capacities of the energy-producing states and certain other states with above-average abilities to collect taxes from nonresidents. Therefore, substituting an RTS or RRS index for relative per capita income in a federal aid formula would mean substituting one set of errors for another.

Fiscal Capacity per Capita versus Fiscal Capacity per Pupil. Apart from the issues of fiscal capacity measurement already mentioned, an issue that pertains specifically to fiscal capacity to support education is whether capacity should be measured per capita or per pupil. Because there are about six times as many people overall as there are elementary-secondary pupils in the United States, fiscal capacity per pupil is numerically about six times as great, on average, as capacity per capita. What matters in constructing a fiscal capacity index, however, is how this ratio varies among states. In fact, such variations are substantial. In comparison to the nation as a whole, which has a pupil-to-population ratio of .166, the highest state ratio (Utah) is .255, while the lowest (Rhode Island) is .135. Consequently, Utah appears to have far lower fiscal capacity when capacity is measured per pupil than when it is measured per capita (scores of 48.0 and 73.9, respectively, on indices of personal income), while Rhode Island has much higher capacity according to an index of income per pupil than according to an index of income per capita (scores of 123.5 and 102.4, respectively). Using a per-pupil measure arguably makes sense when the objective is to compare the states' capacities to finance elementary-secondary education (note that the usual fiscal capacity indicator in state

school finance formulas is property value *per pupil*), but no pupil-based capacity indicator has appeared thus far in any federal formula. As will be seen, switching from a per capita to a per-pupil capacity indicator could significantly influence allocations of federal funds.

Differences among the Capacity Indices. Table 44 shows the degree to which state fiscal capacity ratings vary with the way capacity is measured. The first four columns present indices of fiscal capacity per capita based on personal income, gross state product, and the ACIR's RTS and RRS measures; the last four present indices of fiscal capacity per pupil (i.e., per K-12 enrollee) based on the same four underlying capacity measures.[31] When the per capita indices are compared with one another, it can be seen that certain states have similar scores on all four (e.g., Alabama, Arkansas, California, Idaho, Minnesota, South Carolina, and Washington), while others have much greater capacity according to some indices than according to others. Among the states whose ratings depend most strongly on the choice of measure are major energy-producing states such as Alaska, Louisiana, Texas, and Wyoming, all of which score much lower on the personal income index than on either the GSP or ACIR measures; the District of Columbia, which rates sharply higher on the GSP index than on the others; and Delaware, Nevada, and Hawaii, which rank higher according to the ACIR indicators than according to either income or GSP. Obviously, the effects on such states of distributing aid partly according to fiscal capacity would depend strongly on the particular capacity measure selected.

As already explained, the relationship between a state's fiscal capacity per capita and its fiscal capacity per pupil depends entirely on the state's pupil-to-population ratio, or enrollment rate. Among the states with about average enrollment rates and hence roughly equal fiscal capacities per capita and per pupil are Arizona, Kansas, Nebraska, Nevada, Ohio,

Table 44

Alternative Indices of State Fiscal Capacity

State	Indices of Fiscal Capacity per Capita				Indices of Fiscal Capacity per K-12 Enrollee			
	Personal Income 1988	Gross State Product 1986	RTS 1986	RRS 1986	Personal Income 1988	Gross State Product 1986	RTS 1986	RRS 1986
Alabama	77.9	78.1	74.3	74.6	71.4	71.0	67.6	67.8
Alaska	115.8	210.8	176.9	286.6	93.5	171.9	144.2	233.7
Arizona	90.8	92.3	98.7	95.9	90.1	91.6	97.9	95.1
Arkansas	74.1	76.7	73.3	72.6	66.1	68.8	65.8	65.1
California	113.7	113.8	117.8	117.1	116.8	118.2	122.4	121.7
Colorado	99.9	104.2	116.8	115.0	95.8	101.3	113.6	111.8
Connecticut	139.9	127.4	135.2	138.8	158.1	144.1	153.0	157.0
Delaware	107.1	106.4	121.4	119.4	120.3	118.8	135.6	133.3
District of Columbia	129.7	264.5	122.2	122.5	150.7	311.6	144.0	144.3
Florida	100.7	87.6	105.1	102.3	121.4	107.2	128.7	125.3
Georgia	92.5	97.0	94.0	92.1	86.0	89.9	87.1	85.3
Hawaii	101.6	104.6	113.3	109.4	109.3	110.9	120.1	116.0
Idaho	76.8	75.5	76.9	75.8	59.0	59.5	60.6	59.7
Illinois	106.6	104.4	95.9	97.3	111.2	108.2	99.4	100.9
Indiana	90.5	88.7	86.9	86.0	84.9	82.9	81.1	80.3
Iowa	88.9	88.4	83.7	84.1	85.3	85.1	80.6	81.0
Kansas	95.6	95.3	95.7	95.1	92.2	97.6	94.1	93.5
Kentucky	77.8	82.0	76.4	76.6	73.4	77.8	72.5	72.7
Louisiana	74.5	95.1	90.1	93.7	67.2	88.5	83.9	87.2
Maine	91.6	84.9	94.5	91.7	84.8	79.2	88.2	85.6
Maryland	118.2	98.6	107.6	107.3	130.0	107.4	117.2	116.9
Massachusetts	126.3	113.9	123.5	121.5	146.6	129.0	139.8	137.6
Michigan	100.4	96.4	96.2	95.8	95.0	85.5	85.3	85.0
Minnesota	101.1	103.2	102.4	100.7	98.3	101.1	100.3	98.6
Mississippi	67.4	69.7	65.3	65.1	56.9	63.7	59.6	59.4
Missouri	93.7	94.8	92.7	94.6	97.8	99.0	96.8	98.8
Montana	78.0	85.4	88.0	87.6	67.1	74.5	76.8	76.4
Nebraska	89.6	95.5	91.2	90.7	87.2	94.1	89.9	89.4
Nevada	106.2	116.0	146.8	136.5	108.3	118.2	149.5	139.0
New Hampshire	117.9	103.7	119.4	121.2	125.4	108.4	124.9	126.7
New Jersey	133.4	116.8	120.5	125.3	153.4	130.7	134.8	140.2
New Mexico	75.7	91.8	91.3	102.3	64.7	80.2	79.7	89.3
New York	117.1	117.4	106.8	109.0	131.6	130.4	118.7	121.1
North Carolina	86.8	91.7	86.3	86.3	84.4	87.6	84.4	82.4
North Dakota	77.8	90.9	73.9	92.9	71.0	85.3	88.1	87.2
Ohio	94.2	94.2	90.9	91.7	92.8	92.5	89.2	90.1
Oklahoma	80.8	86.7	98.1	94.7	73.0	79.3	89.7	86.6
Oregon	90.3	88.0	93.3	92.3	89.2	86.9	92.2	91.2
Pennsylvania	98.5	88.8	89.7	90.3	115.3	102.8	103.8	104.5
Rhode Island	102.4	89.7	91.9	96.8	123.5	107.4	110.1	115.9
South Carolina	78.4	76.2	78.6	77.0	72.0	69.5	71.7	70.3
South Dakota	77.4	79.6	77.8	77.4	70.8	74.3	72.6	72.3
Tennessee	84.1	86.6	83.5	81.8	81.4	83.8	80.8	79.1
Texas	88.5	104.6	103.5	100.6	74.9	91.4	90.4	87.8
Utah	73.9	82.9	80.4	79.3	48.0	56.1	54.4	53.6
Vermont	92.9	91.8	99.4	96.9	90.8	90.3	97.8	95.3
Virginia	107.2	103.5	100.7	100.2	107.2	101.4	98.7	98.2
Washington	99.9	100.1	97.8	97.3	97.4	97.7	95.4	94.9
West Virginia	71.2	72.2	76.4	74.2	63.1	63.5	67.1	65.2
Wisconsin	94.1	92.5	85.8	86.3	96.3	94.4	87.6	88.1
Wyoming	82.6	132.4	150.7	157.3	65.4	107.1	121.8	127.2
50 States + D.C.	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Oregon, Vermont, Virginia, and Wisconsin. States with particularly low enrollment rates--Connecticut, Florida, Massachusetts, New Jersey, New York, Pennsylvania, and Rhode Island--have much greater fiscal capacities per pupil than per capita. States with especially high rates of enrollment--Alaska, Idaho, Mississippi, New Mexico, Texas, Utah, and Wyoming--rate much lower in capacity according to per-pupil than per capita indices. The states with high enrollment rates would fare better under capacity-based aid formulas if capacity were expressed in per-pupil terms, while states with low enrollment rates would do better if the per capita measures were retained.

Effects of Replacing per Capita Income with Alternative Fiscal Capacity Indices: Illustrations Using the Vocational Education Formula

The Vocational Education formula is used here to illustrate the effects of the two kinds of changes in fiscal capacity indicators discussed earlier: (1) switching to a capacity measure other than per capita income and (2) replacing an indicator of fiscal capacity per capita with an indicator of fiscal capacity per pupil.

Effects of Switching to Alternative Capacity Indicators. The effects of substituting other fiscal capacity indices for the per capita income factor in the Vocational Education formula are illustrated in Table 45. To see these effects in their pure forms, we work with an unconstrained version of that formula--one from which the 1/2 of 1 percent floor, the hold-harmless provision, and the .4 to .6 limits on the fiscal capacity factor have been deleted. The base case for the comparisons therefore is not the actual interstate distribution of Vocational Education funds but the distribution that would exist in the absence of all these restrictions.

The table shows what would happen if the GSP index, the RTS index, or the RRS index (all measured in per capita terms) were substituted for the per capita income factor in

Table 45

Effects of Replacing per Capita Income with
Alternative Measures of Fiscal Capacity: Illustrations
Using an Unconstrained Vocational Education Formula, Fiscal Year 1989
(Allocations in thousands of dollars)

State	Base Case: Allocation According to per Capita Income (No Constraints)	Allocation with Income Replaced by Gross State Product		Allocation with Income Replaced by RTS Index		Allocation with Income Replaced by RRS Index	
		Amount	Percentage Change	Amount	Percentage Change	Amount	Percentage Change
Alabama	17,307	17,171	-0.8	17,707	2.3	17,633	1.9
Alaska	1,327	0	-100.0	413	-68.9	0	-100.0
Arizona	11,704	11,781	0.7	11,089	-5.3	11,375	-2.8
Arkansas	9,971	9,842	-1.3	10,118	1.5	10,155	1.8
California	74,648	75,764	1.5	72,272	-3.2	72,757	-2.5
Colorado	10,455	10,340	-1.1	8,982	-14.1	9,160	-12.4
Connecticut	6,974	7,692	10.3	6,868	-1.5	6,475	-7.2
Delaware	2,040	2,039	0.0	1,712	-16.1	1,752	-14.1
District of Columbia	1,324	0	-100.0	1,467	10.8	1,459	10.2
Florida	35,867	40,439	12.7	34,144	-4.8	35,088	-2.2
Georgia	23,764	22,613	-4.8	23,275	-2.1	23,650	-0.5
Hawaii	3,573	3,425	-4.1	3,115	-12.8	3,249	-9.1
Idaho	4,077	4,124	1.1	4,079	0.1	4,109	0.8
Illinois	35,856	36,499	1.8	39,751	10.9	39,146	9.2
Indiana	20,825	21,003	0.9	21,358	2.6	21,490	3.2
Iowa	9,969	10,223	2.5	10,661	6.9	10,605	6.4
Kansas	7,920	7,880	-0.5	8,161	3.0	8,193	3.5
Kentucky	15,739	15,160	-3.7	15,882	0.9	15,828	0.6
Louisiana	18,753	16,023	-14.6	16,793	-10.5	16,214	-13.5
Maine	4,520	4,641	2.7	4,255	-5.9	4,360	-3.6
Maryland	12,943	15,625	20.7	14,242	10.0	14,263	10.2
Massachusetts	15,483	16,792	8.5	14,931	-3.6	15,294	-1.2
Michigan	31,870	33,178	4.1	33,246	4.3	33,314	4.5
Minnesota	13,523	13,412	-0.8	13,531	0.1	13,742	1.6
Mississippi	12,529	12,207	-2.6	12,628	0.8	12,624	0.8
Missouri	17,339	17,396	0.3	17,756	2.4	17,411	0.4
Montana	3,108	2,961	-4.7	2,895	-6.8	2,900	-6.7
Nebraska	5,478	5,347	-2.4	5,566	1.6	5,582	1.9
Nevada	2,937	2,614	-11.0	1,657	-43.6	1,974	-32.8
New Hampshire	3,155	3,454	9.5	2,892	-8.3	2,822	-10.5
New Jersey	18,012	21,114	17.2	20,187	12.1	18,934	5.1
New Mexico	6,180	5,502	-11.0	5,529	-10.5	4,961	-19.7
New York	49,777	48,391	-2.8	54,615	9.7	53,231	6.9
North Carolina	25,606	24,104	-5.9	24,875	-2.9	25,275	-1.3
North Dakota	2,478	2,348	-5.2	2,285	-7.8	2,302	-7.1
Ohio	38,040	38,229	0.5	39,472	3.8	39,077	2.7
Oklahoma	12,437	12,137	-2.4	10,919	-12.2	11,263	-9.4
Oregon	9,282	9,509	2.4	9,063	-2.4	9,131	-1.6
Pennsylvania	39,629	43,143	8.9	42,811	8.0	42,502	7.2
Rhode Island	3,254	3,581	10.1	3,511	7.9	3,346	2.8
South Carolina	14,858	14,996	0.9	14,705	-1.0	14,872	0.1
South Dakota	2,713	2,730	0.6	2,772	2.2	2,776	2.3
Tennessee	19,336	18,591	-3.8	19,109	-1.2	19,353	0.1
Texas	60,780	54,048	-11.1	54,715	-10.0	56,258	-7.4
Utah	7,138	6,680	-6.4	6,827	-4.4	6,877	-3.6
Vermont	2,071	2,054	-0.8	1,911	-7.8	1,955	-5.6
Virginia	19,208	19,605	2.1	20,186	5.1	20,251	5.4
Washington	14,446	14,601	1.1	14,945	3.5	14,991	3.8
West Virginia	8,233	8,220	-0.2	7,954	-3.4	8,081	-1.8
Wisconsin	16,747	17,163	2.5	18,233	8.9	18,120	8.2
Wyoming	1,786	1,068	-40.2	779	-56.4	674	-62.3
Puerto Rico	17,071	16,634	-2.6	17,206	0.8	17,200	0.8
Other Territories	1,538	1,509	-1.9	1,547	0.6	1,547	0.6
United States	825,600	825,600	0.0	825,600	0.0	825,600	0.0

the Vocational Education formula. The general effect, of course, would be to shift funds away from states that appear to have higher capacities according to these other indices than according to income and toward states that score higher on the income index than on the alternatives. The states most adversely affected by shifting to any of the three alternatives would be such energy producers as Alaska, Louisiana, Texas, and Wyoming (plus, for a different reason, Nevada); the principal gainers would be states in the Northeast. Some of the details vary with the alternative selected. The two ACIR indices, the RTS and RRS, are so similar that there would be little difference in distributional effects if one or the other were selected as the capacity measure, but both differ from the index based on gross state product. Some states that would lose significant amounts of aid under the RTS and RRS options would not lose, or would lose much less, if income were replaced by GSP (e.g., Delaware, Hawaii, Nevada, Oklahoma, and Vermont). States such as Connecticut, Maryland, Massachusetts, and New Hampshire also would do better with a GSP index than with the RTS or RRS measures, whereas New York and Illinois would be better off with the RTS measures. Note that because of the mathematical form of the fiscal capacity adjustment factor used in these illustrations, both Alaska and the District of Columbia, with GSP index values exceeding 200, would lose all their aid if that indicator were chosen to replace per capita income. In general, Table 45 shows that the effects of switching from per capita income to another fiscal capacity measure would be relatively moderate for most states, but that allocations to 10 to 15 states are highly sensitive to the choice of a capacity indicator.

Effects of Switching from a per Capita Indicator to a per-Pupil Indicator of Capacity. There is a strong logical case for computing fiscal capacity, for the purpose of distributing federal education aid, in per-pupil rather than per capita terms. The issue at hand,

after all, is how well states can support schools for their elementary and secondary pupils, not how capable they are of financing public services for their general populations. Although the two kinds of ability are correlated, they diverge to the extent that different states have different fractions of their populations in school. The states themselves seem to have no doubts that per-pupil measures are the appropriate ones to use in distributing education funds to school districts. Measures such as assessed property value per pupil appear in virtually all state aid formulas; per capita measures are rarely if ever used. The option of taking the same approach at the federal level deserves to be considered.

Table 46 shows how allocations of Vocational Education grants would be altered by switching from per capita to per-pupil versions of two selected fiscal capacity measures, per capita income and the RTS index.[32] The effects depend solely on the enrollment rate (pupil-to-population ratio) of each state. States with relatively large fractions of their populations in school have lower capacities, and hence receive more aid, according to the per-pupil measures, while states with small percentages of their populations in school appear less well-off and hence receive larger grants under the per capita measures. The pattern of redistribution is shown in Figure 15. Among the states with high enrollment that would benefit the most from a shift to the per-pupil indicators are Alaska, Idaho, Montana, New Mexico, Texas, Utah, and Wyoming. Those whose grants would decline the most are Connecticut, Florida, Massachusetts, New Jersey, New York, Pennsylvania, and the District of Columbia. Were it not for the special situation of Florida, which has a relatively low enrollment rate because of its large population of retirees, the effects would divide sharply along regional lines, with the Northeast standing to lose from adoption of a per-pupil indicator and the West and Sunbelt standing to gain.

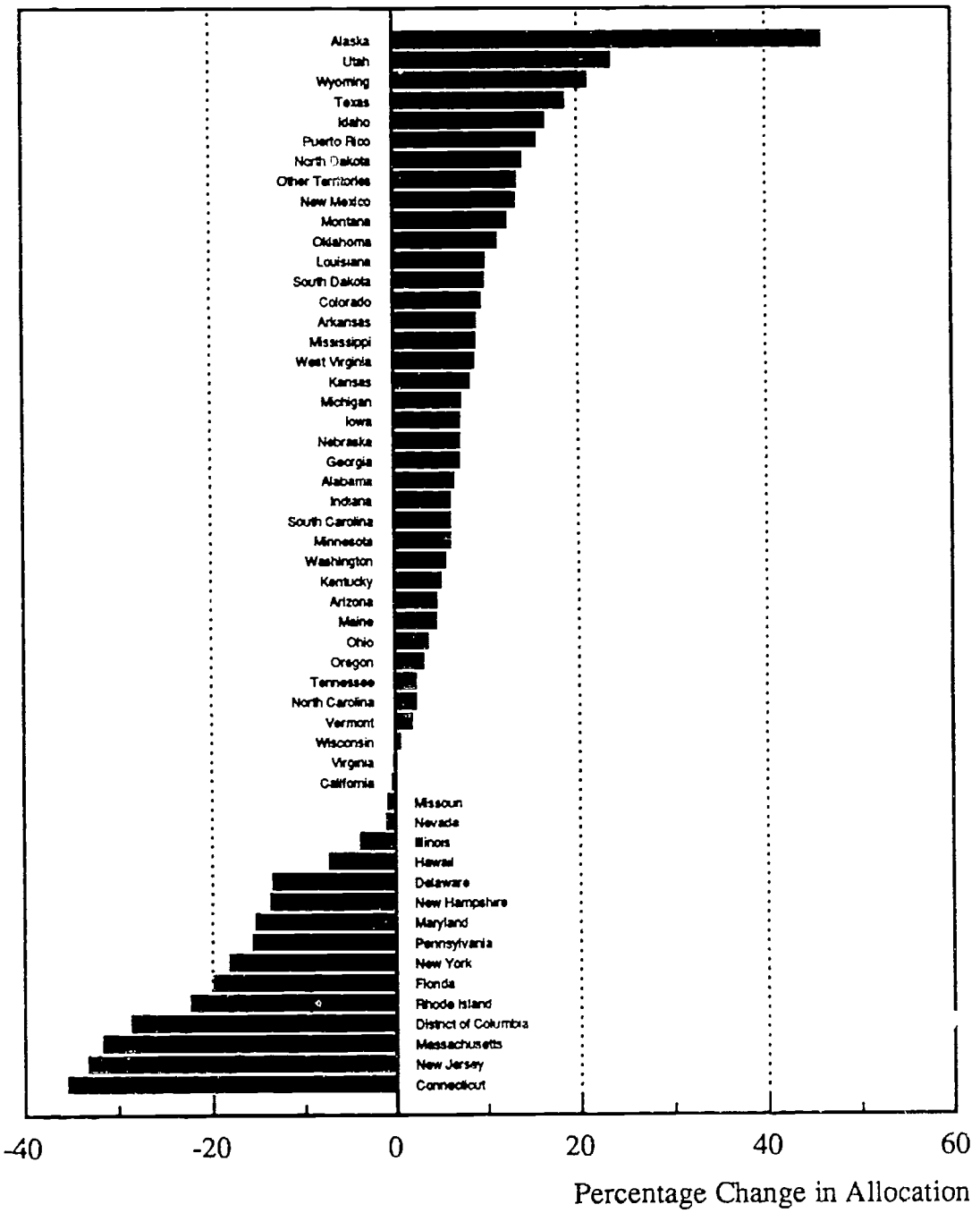
Table 46

Effects of Switching from a per Capita to a
per-Pupil Index of Fiscal Capacity: Illustrations
Using an Unconstrained Vocational Education Formula, Fiscal Year 1989
(Allocations in thousands of dollars)

State	Capacity Indices Based on Personal Income			Capacity Indices Based on RTS Method		
	Allocation Using the per Capita Index	Allocation Using the per-Pupil Index	Percentage Change	Allocation Using the per Capita Index	Allocation Using the per-Pupil Index	Percentage Change
Alabama	17,307	18,425	6.5	17,707	18,882	6.6
Alaska	1,327	1,937	46.0	413	1,009	144.4
Arizona	11,704	12,237	4.6	11,089	11,317	2.1
Arkansas	9,971	10,873	9.0	10,118	10,851	7.2
California	74,648	74,438	-0.3	72,272	69,059	-4.4
Colorado	10,455	11,443	9.5	8,982	9,444	5.2
Connecticut	6,974	4,515	-35.3	6,868	5,048	-26.5
Delaware	2,040	1,765	-13.5	1,712	1,420	-17.0
District of Columbia	1,324	946	-28.6	1,467	1,070	-27.1
Florida	35,867	28,750	-19.8	34,144	25,977	-23.9
Georgia	23,764	25,454	7.1	23,275	25,090	7.8
Hawaii	3,573	3,314	-7.3	3,115	2,905	-6.7
Idaho	4,077	4,751	16.5	4,079	4,676	14.6
Illinois	35,856	34,470	-3.9	39,751	38,878	-2.2
Indiana	20,825	22,102	6.1	21,358	22,719	6.4
Iowa	9,969	10,691	7.2	10,661	11,080	3.9
Kansas	7,920	8,580	8.3	8,161	8,389	2.8
Kentucky	15,739	16,543	5.1	15,882	16,583	4.4
Louisiana	18,753	20,637	10.0	16,793	17,964	7.0
Maine	4,520	4,722	4.5	4,255	4,563	7.2
Maryland	12,943	10,968	-15.3	14,242	12,919	-9.3
Massachusetts	15,483	10,593	-31.6	14,931	11,891	-20.4
Michigan	31,870	34,199	7.3	33,246	37,176	11.8
Minnesota	13,523	14,345	6.1	13,531	13,992	3.4
Mississippi	12,529	13,642	8.9	12,628	13,319	5.5
Missouri	17,339	17,203	-0.8	17,756	17,287	-2.6
Montana	3,108	3,492	12.4	3,895	3,224	11.4
Nebraska	5,478	5,871	7.2	5,566	5,704	2.5
Nevada	2,937	2,906	-1.0	1,657	1,591	-4.0
New Hampshire	3,155	2,723	-13.7	2,892	2,729	-5.6
New Jersey	18,012	12,041	-33.2	20,187	16,751	-17.0
New Mexico	6,180	7,000	13.3	5,529	6,192	12.0
New York	49,777	10,780	-18.1	54,615	48,243	-11.7
North Carolina	25,606	26,183	2.3	24,875	26,068	4.8
North Dakota	2,478	2,825	14.0	2,285	2,438	6.7
Ohio	38,0 3	39,396	3.6	39,472	40,539	2.7
Oklahoma	12,437	13,841	11.3	10,919	11,962	9.6
Oregon	9,282	9,574	3.1	9,063	9,270	2.3
Pennsylvania	39,629	33,447	-15.6	42,811	37,780	-11.8
Rhode Island	3,254	2,528	-22.3	3,511	2,957	-15.8
South Carolina	14,858	15,765	6.1	14,705	15,726	6.9
South Dakota	2,713	2,981	9.9	2,772	2,925	5.5
Tennessee	19,336	19,786	2.3	19,109	19,795	3.6
Texas	60,780	72,117	18.7	54,715	62,922	15.0
Utah	7,138	8,819	23.6	6,827	8,412	23.2
Vermont	2,071	2,109	1.8	1,911	1,966	2.9
Virginia	19,208	19,194	-0.1	20,186	20,854	3.3
Washington	14,446	15,255	5.6	14,945	15,481	3.6
West Virginia	8,233	8,955	8.8	7,954	8,654	8.8
Wisconsin	16,747	16,833	0.5	18,233	18,166	-0.4
Wyoming	1,786	2,163	21.1	779	1,250	60.5
Puerto Rico	17,071	19,729	15.6	17,206	18,819	9.4
Other Territories	1,538	1,744	13.4	1,547	1,673	8.1

Figure 15

Changes in Allocations as a Result of Switching to a per-Pupil Index of Fiscal Capacity in the Vocational Education Formula



Effects of Incorporating Fiscal Capacity Factors into Other Education Aid Formulas: Illustration Using Chapter 2 Block Grants

Although only the Vocational Education formula now contains a fiscal capacity factor, whatever logic justifies its presence there should apply equally well to other federal elementary-secondary grant programs. At present, federal fund allocation policies are inconsistent in this regard: one program distributes funds in an inverse relationship to the states' abilities to pay; the other programs do not. It is of considerable interest, therefore, to see what the effects would be of incorporating into other formulas a fiscal capacity adjustment similar to the one used in Vocational Education.

Because of its simplicity, the Chapter 2 Block Grant formula has been chosen to illustrate the redistributive effects of adding a fiscal capacity factor to a formula that does not now have one. Specifically, three versions of such an adjustment are examined: one identical to the adjustment for per capita income in Vocational Education; the second, the same but based on income per pupil rather than income per capita; the third, a similar adjustment but based on the RTS index of fiscal capacity per capita rather than on per capita income. To show the full effects of adding the fiscal capacity factor, we work with a version of the Chapter 2 Block Grant formula that does not include the 1/2 of 1 percent lower bound on each state's share of the available funds. Thus the base case for these illustrations is not the actual Chapter 2 Block Grant distribution for FY 1989 but rather the distribution that would have been produced in the absence of that aid floor.

Table 47 shows how the three alternatives would alter the interstate distribution of Chapter 2 Block Grant funds. The effects of the first and third alternatives (those based on per capita measures) are also presented graphically in Figure 16. The general effect of

Table 47

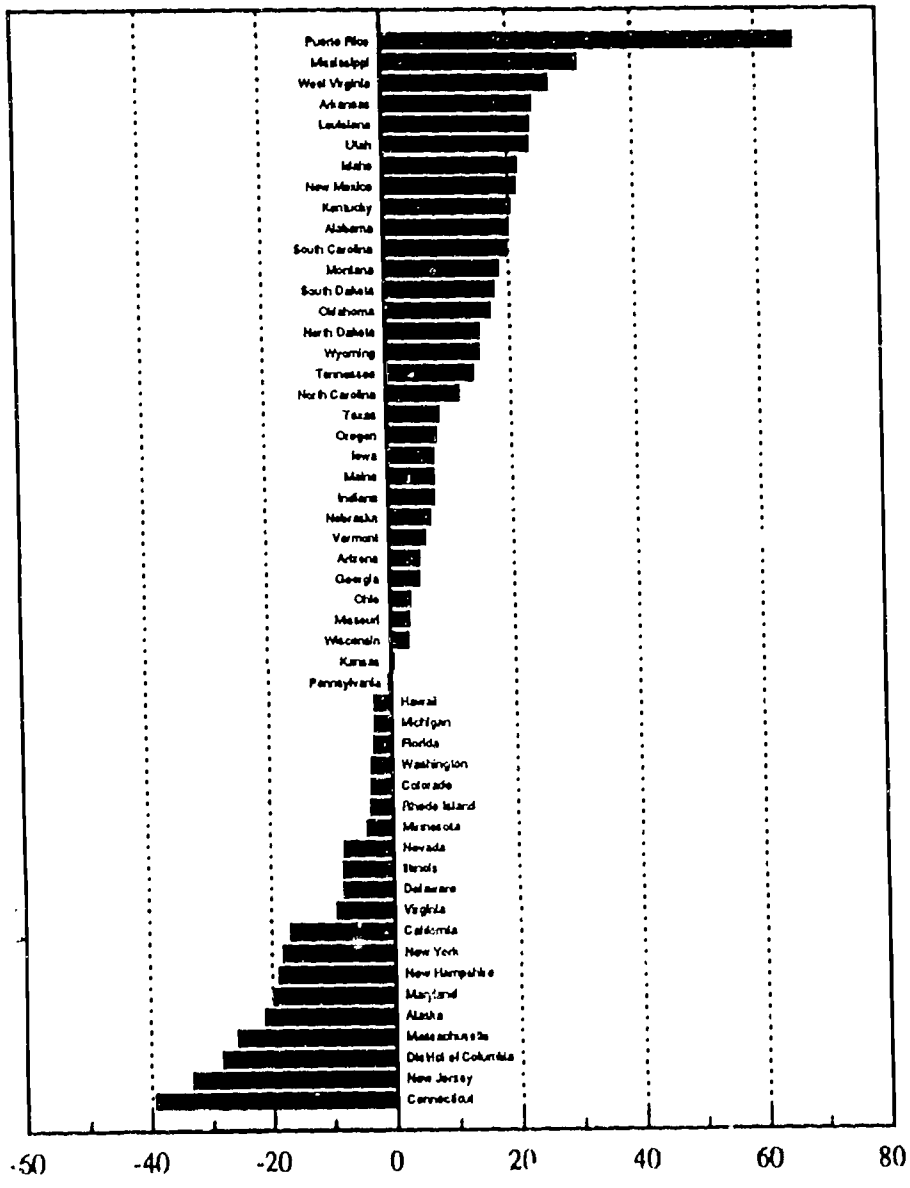
Effects of Incorporating Alternative Fiscal Capacity Factors into the Chapter 2 Block Grant Formula, Fiscal Year 1989
(Allocations in thousands of dollars)

State	Base-Case Allocation (No Lower Bound)	Fiscal Capacity Represented by Income per Capita			Fiscal Capacity Represented by Income per Pupil			Fiscal Capacity Represented by RTS Index (per Capita)		
		Allocation	Difference from Base Case	Percentage Change	Allocation	Difference from Base Case	Percentage Change	Allocation	Difference from Base Case	Percentage Change
Alabama	8,175	9,808	1633	20.0	10,459	2284	27.9	10,227	2052	25.1
Alaska	1,114	877	-237	-21.2	1,134	20	1.8	256	-858	-77.0
Arizona	6,285	6,593	308	4.9	6,843	558	8.9	6,337	51	0.8
Arkansas	4,724	5,856	1132	24.0	6,299	1575	33.3	5,957	1233	26.1
California	49,726	41,326	-8399	-16.9	41,050	-8676	-17.4	40,679	-9047	-18.2
Colorado	6,017	5,813	-204	-3.4	6,090	73	1.2	4,982	-1035	-17.2
Connecticut	5,400	3,271	-2130	-39.4	2,288	-3112	-57.6	3,483	-1918	-35.5
Delaware	1,144	1,051	-93	-8.1	932	-212	-18.5	895	-249	-21.8
District of Columbia	895	643	-252	-28.2	440	-455	-50.9	693	-202	-22.6
Florida	18,816	18,269	-547	-2.9	14,892	-3924	-20.9	17,771	-1045	-5.6
Georgia	12,521	13,120	599	4.8	14,231	1710	13.7	13,209	688	5.5
Hawaii	1,959	1,907	-52	-2.7	1,788	-171	-8.7	1,690	-269	-13.7
Idaho	2,208	2,681	473	21.4	3,108	901	40.8	2,705	497	22.5
Illinois	21,621	19,872	-1749	-8.1	18,926	-2695	-12.5	22,399	778	3.6
Indiana	10,741	11,542	802	7.5	12,257	1516	14.1	12,090	1349	12.6
Iowa	5,331	5,732	401	7.5	5,960	629	11.8	6,170	839	15.7
Kansas	4,555	4,573	18	0.4	4,782	227	5.0	4,728	173	3.8
Kentucky	7,340	8,833	1494	20.3	9,226	1886	25.7	9,028	1689	23.0
Louisiana	9,249	11,436	2187	23.6	12,146	2897	31.3	10,116	867	9.4
Maine	2,188	2,352	164	7.5	2,541	353	16.1	2,297	109	5.0
Maryland	7,877	6,314	-1563	-19.8	5,534	-2342	-29.7	7,243	-634	-8.0
Massachusetts	9,418	6,996	-2422	-25.7	5,103	-4315	-45.8	7,170	-2248	-23.9
Michigan	17,852	17,364	-487	-2.7	18,467	615	3.4	18,441	589	3.3
Minnesota	7,837	7,513	-324	-4.1	7,872	35	0.4	7,612	-225	-2.9
Mississippi	5,768	7,568	1800	31.2	8,248	2480	43.0	7,732	1964	34.1
Missouri	9,348	9,649	301	3.2	9,362	14	0.1	9,983	634	6.8
Montana	1,591	1,882	291	18.3	2,070	479	30.1	1,774	182	11.5
Nebraska	3,003	3,205	202	6.7	3,310	307	10.2	3,252	249	8.3
Nevada	1,750	1,615	-136	-7.8	1,666	-85	-4.8	927	-824	-47.1
New Hampshire	1,890	1,533	-356	-18.9	1,446	-443	-23.5	1,516	-374	-19.8
New Jersey	13,108	8,766	-4342	-33.1	6,163	-6944	-53.0	10,371	-2737	-20.9
New Mexico	3,103	3,760	657	21.2	4,154	1051	33.9	3,357	254	8.2
New York	30,959	25,352	-5607	-18.1	20,910	-10049	-32.5	28,716	-2244	-7.2
North Carolina	11,825	13,194	1369	11.6	13,674	1850	15.6	13,145	1320	11.2
North Dakota	1,313	1,510	197	15.0	1,609	297	22.6	1,386	73	5.6
Ohio	20,517	21,210	693	3.4	21,713	1196	5.8	22,297	1780	8.7
Oklahoma	6,315	7,367	1052	16.7	7,881	1566	24.8	6,404	89	1.4
Oregon	4,933	5,327	394	8.0	5,478	545	11.0	5,238	305	6.2
Pennsylvania	20,567	20,483	-84	-0.4	17,131	-3436	-16.7	22,576	2010	9.8
Rhode Island	1,631	1,574	-57	-3.5	1,242	-389	-23.8	1,755	124	7.6
South Carolina	6,812	8,157	1344	19.7	8,726	1913	28.1	8,231	1418	20.8
South Dakota	1,372	1,613	241	17.5	1,726	353	25.8	1,669	297	21.6
Tennessee	9,179	10,460	1280	13.9	10,846	1666	18.2	10,643	1463	15.9
Texas	34,629	37,548	2919	8.4	42,682	8053	23.3	33,257	-1372	-4.0
Utah	4,426	5,456	1031	23.3	6,698	2272	51.3	5,268	842	19.0
Vermont	1,004	1,063	58	5.8	1,104	99	9.9	1,006	1	0.1
Virginia	10,323	9,376	-947	-9.2	9,591	-732	-7.1	10,202	-121	-1.2
Washington	8,225	7,957	-267	-3.3	8,382	157	1.9	8,365	141	1.7
West Virginia	3,710	4,696	986	26.6	5,015	1305	35.2	4,563	853	23.0
Wisconsin	9,080	9,353	273	3.0	9,273	193	2.1	10,320	1240	13.7
Wyoming	1,044	1,200	156	14.9	1,376	332	31.8	512	-532	-50.9
Puerto Rico	8,755	14,557	5802	66.3	15,328	6573	75.1	8,535	-221	-2.5
United States	459,171	459,171	0	0.0	459,171	0	0.0	459,171	0	0.0

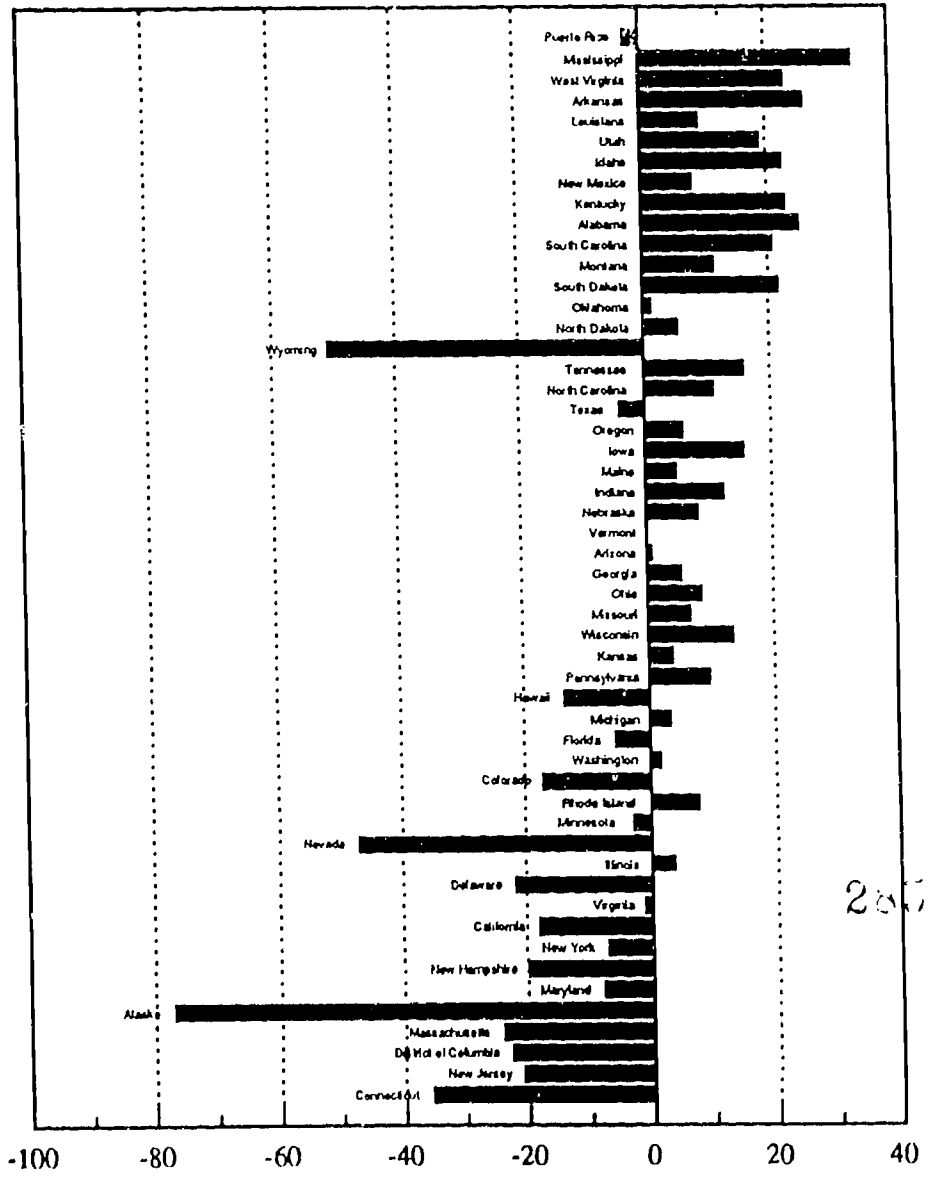
Figure 16

Changes in Allocations as a Result of Incorporating Alternative Fiscal Capacity Factors into the Chapter 2 Block Grant Formula

Fiscal Capacity Measured by per Capita Income



Fiscal Capacity Measured by the RTS Index



inserting a fiscal capacity adjustment is always, by definition, to redistribute federal aid away from states with higher fiscal capacity and toward states with lower capacity. Thus states that have high fiscal capacity by any definition, such as California, Connecticut, Maryland, and New Jersey, lose substantial amounts of aid under all three alternatives; and states that unambiguously have below-average fiscal capacity, such as Alabama, Mississippi, and South Dakota, gain significantly in all three cases.

Incorporating a fiscal capacity factor based on per capita income into the formula (the first alternative represented in Table 47) produces gains and losses ranging up to about 20 percent of the base-case state allocations, but changing the fiscal capacity measure to income per pupil (the second alternative shown in the table) amplifies the redistributive effects. The reason is that the economic and demographic determinants of fiscal capacity tend to reinforce each other. For example, the state of Utah gains from an adjustment for per capita income because its per capita income is below the national average, but it gains considerably more from an adjustment for per-pupil income because it also has more pupils relative to population than other states. Conversely, Connecticut loses from an adjustment for per capita income because it is a high-income state, but it loses much more when the adjustment is based on per-pupil income because it also has a below-average pupil-to-population ratio. This pattern does not always hold. For example, the negative effect on Alaska's aid allocation of its high per capita income is offset, under the alternative based on per-pupil income, by the state's high ratio of pupils to population. Nevertheless, the two factors do reinforce each other most of the time--the net effect being that a fiscal capacity adjustment based on income per pupil is more strongly redistributive than one based on income per capita.

The RTS capacity index agrees with the per capita income index much of the time but deviates sharply from it in certain instances (see Table 44). Consequently, the effects of an RTS-based fiscal capacity adjustment on certain states' allocations are conspicuously different from those of the income-based adjustment. The contrast is brought out dramatically in Figure 16, in which states are presented in the same order in both bar charts to underscore the differences between the two capacity measures. Energy-producing states and other states able to collect substantial revenues from nonresidents (e.g., Nevada) are assigned very high fiscal capacity scores by the RTS methodology. Thus, Texas and Wyoming, which would benefit from an adjustment based on per capita income, end up with reduced aid under an adjustment based on the RTS, while Nevada and Alaska, which would lose aid under both options, suffer far greater losses when the RTS is employed. Conversely, because northeastern states such as Maryland, New York, and Rhode Island have higher fiscal capacity according to the per capita income index than according to the RTS index, they would be less adversely affected by an adjustment based on the latter; in fact, Rhode Island would gain if the RTS were used. In sum, the effects of a fiscal capacity adjustment on certain states would be sensitive to both the choice of a fiscal capacity indicator and the decision as to whether to measure fiscal capacity in per capita or per-pupil terms.

Should Fiscal Capacity Be Taken into Account?

All the foregoing notwithstanding, the fundamental issue concerning fiscal capacity is not how but whether it should be taken into account in federal education aid formulas. Thus far, Congress has given a mixed answer: fiscal capacity, represented by per capita income, plays an important role in distributing Vocational Education funds (and certain grant funds outside education) but does not enter into the other major education aid formulas. This

seeming inconsistency raises the question, Should the fiscal capacity factor be retained in Vocational Education, and, if so, should it not be taken into account in allocating other education aid as well?

The case for fiscal capacity adjustments arises out of concern about equity in the distribution of educational services--especially services financed partly with federal funds. States vary widely in their capacities to finance education, including the particular kinds of education--compensatory education, vocational education, and special education of the handicapped--that have become special concerns of the federal government. In the absence of federal aid, there would be large interstate disparities, correlated with state fiscal capacity, in levels of support for such programs. Federal aid that is distributed uniformly (i.e., not in a negative relationship to state fiscal capacity) helps to counter these disparities only in certain circumstances. Specifically, in program areas where federal funding dominates, such aid could suffice to ensure a reasonably uniform base level of support. However, compensatory education for the disadvantaged is the only such area in elementary-secondary education, and even in that area federal dollars cover a declining share of the costs. In areas where the federal share of funding is minor, such as vocational education and special education for the handicapped, uniformly distributed federal aid does almost nothing to offset the inequality stemming from differences in state income or wealth. If there is a federal interest in equitable treatment of target-group children, it needs to be expressed in explicit fiscal equalization policy--which means, in practice, that aid should be distributed in a negative relationship to state fiscal capacity.

Several arguments have been made against including fiscal capacity factors in the education aid formulas. One is that the categorical nature of federal aid to education makes

such factors inappropriate. The federal interest, the argument goes, is limited to funding specific types of services for specific categories of pupils; it does not extend to correcting general fiscal inequities in education. The target pupils are not necessarily concentrated in low-capacity states; in fact, many poor children live in high-capacity states such as California and New York. Federal dollars, therefore, should be distributed according to where the target pupils are, not according to the states' abilities to pay.

A related argument is that states with high capacity do not always provide high levels of service for their pupils with special needs. Redistributing funds from high-capacity to low-capacity states, therefore, would not always have the intended effect of producing greater equality in the resources available for educating such pupils. In some cases the effect could be to take resources away from pupils who are already being shortchanged by their states.

A third argument is that even if fiscal capacity is an appropriate concern, the fiscal capacities that matter in our decentralized system are the fiscal capacities of local school systems, not the average fiscal capacities of states. High-capacity states may contain low-capacity localities (central cities and rural areas) and vice versa. Therefore, the effect of shifting aid away from high-capacity states may sometimes be to reduce the funds to fiscally needy communities.

But although there is some validity to each of these arguments, the conclusion that adjustments for state fiscal capacity are inappropriate does not necessarily follow. The argument that federal aid is categorical ignores the key point that federal aid, in most instances, covers only a minor fraction of the cost of categorical services, leaving the target pupils dependent on the states' abilities to pay the preponderant share of the costs. Although high fiscal capacity is not always associated with high levels of service, the relationship

between the two is generally positive. Consequently, tilting the aid distribution toward low capacity states means, in most instances, tilting it toward places where services are less adequate. Wealthy states certainly contain poor communities, but on average, communities in the low-capacity states are poorer. Moreover, the way to reach poor communities in rich states is not to ignore differences in state fiscal capacity but to take local fiscal capacity as well as state fiscal capacity into account.

In the end, the issue is whether Congress should be concerned about equitable distribution of the types of educational services it has chosen to support. As long as the federal government pays only a fraction of service costs and the states vary widely in their abilities to provide the necessary additional funds, a system of uniform federal grants, not conditioned on fiscal capacity, will result in services that are less adequate in poorer than in richer states. Distributing aid in an inverse relationship to state fiscal capacity is only a partial solution. It does not address the problem of disparities within states, and, given the scale of federal aid, it can reduce interstate disparities only fractionally. Nevertheless, it is the most significant thing that can be done, within the present framework, to reduce disparities at all.

Summary

Of all the major federal education aid programs, only the Vocational Education program now distributes funds in an inverse relationship to state fiscal capacity (as measured by per capita income). This analysis examines the effects of the per capita income factor in Vocational Education, the effects of modifying the income factor or replacing it with alternative indicators of fiscal capacity, and the implications of incorporating adjustments for fiscal capacity into other education aid formulas.

The per capita income factor in the Vocational Education tilts the aid distribution significantly, but not sharply, in favor of the lower-income states. This tilt could be modestly increased by deleting the present limits on the income factor or by changing its functional form. It could be increased far more drastically, however--in fact, to any desired degree--by resetting a particular formula parameter that controls the steepness of the aid-versus-income relationship.

A weakness of the current Vocational Educatior formula is that per capita income is not a good measure of state fiscal capacity, but alternative capacity indicators are available that could be used in its place. These include gross state product (GSP) and the Representative Tax System (RTS) index of fiscal capacity. The capacity ratings of certain states vary considerably, depending on which indicator is chosen. It is also possible to measure fiscal capacity in per-pupil rather than per capita terms--an alternative that makes sense in education. Doing so raises the capacity ratings of states with relatively low enrollment rates and lowers the capacity ratings of states with large percentages of their populations in school.

Shifting from the per capita income indicator to either the GSP or RTS indicator would significantly alter the distribution of Vocational Education aid. The main losers would be energy-producing states and a few other states with special opportunities to impose taxes on nonresidents. The principal gainers would be states in the Northeast. Shifting from a per capita to a per-pupil measure of capacity would redistribute funds along regional lines, away from the Northeast and toward the Sunbelt and the West.

The Chapter 2 Block Grant formula has been used to illustrate the effects of incorporating adjustments for fiscal capacity into education aid programs other than Vocational

Education. Some of the wealthier states have high fiscal capacity by any definition and would lose from such adjustments no matter how fiscal capacity was measured, while some of the poorer states would benefit no matter how the adjustment was made. However, some states whose capacity scores are sensitive to the choice of a capacity measure could gain or lose Chapter 2 funds depending on which indicator was selected. The redistributive effects would be greater with a per-pupil indicator than with a per capita indicator of fiscal capacity.

REWARDS FOR FISCAL EFFORT

The existing grant formulas do not take into account state fiscal effort, and, as was shown in Chapter 3, there are no significant correlations, either positive or negative, between fiscal effort and aid allocations under the major elementary-secondary programs. The option of establishing a positive relationship by incorporating explicit fiscal effort factors into aid formulas is considered here for three reasons. First, Congress stipulated in the mandate for this study that the possibility of rewarding fiscal effort should be considered. Second, because the principle of linking aid to fiscal effort is reflected in the formulas that some states use to distribute education aid to local school districts, the question arises of whether the same principle should apply in allocating federal education aid to states. Third, linking aid to fiscal effort (as well as to fiscal capacity) is logically required to implement a particular fiscal equity principle, equality of fiscal opportunity (as opposed to equality of fiscal results). There is no way to determine objectively or analytically whether rewarding fiscal effort is desirable. The answer must ultimately hinge on which equity principles federal policymakers wish to pursue and what kinds of incentives they want to create through the federal aid allocation mechanisms. It is possible to demonstrate, however, how federal funds would be redistributed among states (at least in the short run) if state fiscal effort to support education were taken

into account.[33] How different methods of measuring fiscal effort and incorporating effort factors into grant formulas would affect the results can also be shown.

Unfortunately, the possibility of quantifying the effects of rewarding fiscal effort is currently limited to rewards for effort to support elementary-secondary education *in general.* The effects of rewarding fiscal effort to support particular educational activities of interest to the federal government, such as special education of the handicapped, education of the disadvantaged, or vocational education, cannot be analyzed empirically because data on state-local spending for such activities are not available. Nor, of course, could a policy of allocating federal funds according to program-specific effort be implemented, because the required measures of effort cannot be produced. It would take major new data collection efforts, involving cost accounting by program or pupil category at the state and local levels, to make rewards for program-specific effort feasible.[34]

Alternative Measures of Fiscal Effort

A state's fiscal effort to support elementary-secondary education in general is defined, as explained in Chapter 2, as the ratio of state-local elementary-secondary education revenue from nonfederal sources ("own-source education revenue) to state fiscal capacity. Alternative measures of effort may be generated by inserting different fiscal capacity indicators into this ratio's denominator. Four such measures are presented in Table 48. Each corresponds directly to one of the four fiscal capacity measures presented earlier in Table 44.

The differences among the four effort indicators shown in this table are inversely related to differences among the corresponding indicators of capacity; that is, if a state has a higher capacity rating according to capacity index A than according to capacity index B, it necessarily has a lower effort rating according to the effort indicator based on capacity index

Table 48

Alternative Indices of State Fiscal Effort (U.S. = 100)

State	Fiscal Effort Defined as State-Local Education Revenue Relative to: Personal Income (1988)	Gross State Product (1986)	RTS Capacity (1986)	RRS Capacity (1986)
Alabama	89.1	95.8	100.7	100.3
Alaska	184.0	108.1	128.9	79.5
Arizona	96.2	101.3	94.8	97.5
Arkansas	92.0	91.1	95.3	96.2
California	83.7	83.7	80.8	81.3
Colorado	110.0	109.7	97.9	99.4
Connecticut	96.3	93.6	88.2	85.9
Delaware	94.4	96.3	84.3	85.7
District of Columbia	86.2	38.1	82.4	82.2
Florida	85.1	93.3	77.7	79.9
Georgia	102.8	90.4	93.3	95.2
Hawaii	75.5	82.4	76.1	78.8
Idaho	109.9	100.6	98.8	100.2
Illinois	75.9	78.5	85.5	84.2
Indiana	114.2	110.5	112.9	114.1
Iowa	117.0	110.8	117.1	116.5
Kansas	104.7	110.8	115.0	115.7
Kentucky	87.3	73.9	79.3	79.1
Louisiana	106.9	93.6	98.8	95.0
Maine	114.7	117.6	105.6	108.9
Maryland	91.5	108.1	99.1	99.3
Massachusetts	85.5	93.4	86.2	87.6
Michigan	115.2	127.4	127.7	128.2
Minnesota	113.3	110.0	110.9	112.7
Mississippi	91.5	82.9	88.6	88.8
Missouri	92.0	82.4	84.3	82.6
Montana	151.9	145.7	141.4	142.0
Nebraska	107.3	100.0	104.7	105.3
Nevada	83.9	72.9	57.6	61.9
New Hampshire	75.8	82.7	71.9	70.8
New Jersey	104.5	112.6	109.1	104.9
New Mexico	131.6	107.7	108.3	96.6
New York	119.5	114.9	126.3	123.7
North Carolina	93.2	87.6	91.0	93.1
North Dakota	117.4	108.6	105.2	106.3
Ohio	96.3	103.2	107.0	106.0
Oklahoma	99.4	95.0	83.9	86.9
Oregon	107.9	120.1	113.3	114.5
Pennsylvania	109.9	120.4	119.1	118.4
Rhode Island	101.8	107.7	105.1	99.8
South Carolina	110.9	113.6	110.0	112.3
South Dakota	105.5	106.5	109.0	109.6
Tennessee	81.6	69.4	72.0	73.5
Texas	114.7	104.2	105.4	108.4
Utah	145.0	131.6	135.8	137.6
Vermont	120.2	115.8	106.9	109.7
Virginia	98.9	96.2	98.8	99.3
Washington	94.8	106.8	109.3	109.9
West Virginia	124.3	139.1	131.5	135.4
Wisconsin	115.6	114.7	123.6	122.9
Wyoming	184.7	162.5	142.8	136.8
50 States + D.C.	100.0	100.0	100.0	100.0

A than according to the effort indicator based on capacity index B. The District of Columbia, for instance, has a score of 264 on the GSP capacity index, compared with scores in the 120 to 130 range on the other three indices, and so its fiscal effort score is only 38 according to the GSP-based effort index, compared with scores of 80 to 84 on the other effort measures. Most states--39 out of 51--rank consistently either above average or below average in fiscal effort regardless of which effort indicator is used, but in some instances whether a state qualifies as "low effort" or "high effort" depends on which indicator is selected. For example, Louisiana's fiscal effort is above average (107) relative to personal income but below average (94 to 99) relative to other capacity measures, while Washington's fiscal effort is below average (95) relative to personal income but above average (107 to 110) according to the other indicators. Even where a state's effort is unambiguously above or below average, the degree to which that effort exceeds or falls below the average often depends on how effort is measured. Florida's effort index, for example, is 78 when measured relative to the RTS index but 93 when measured relative to GSP, while Vermont's is 107 relative to RTS but 120 relative to income. New Mexico's effort score is 97 relative to the RRS index, 108 relative to either the RTS index or GSP, and 132 relative to income. Clearly, the consequences for some states of a policy of rewarding fiscal effort would depend strongly on which effort index was selected.

Effects of Incorporating Rewards for Effort into Selected Grant Formulas

In principle, effort factors, or rewards for fiscal effort, could be incorporated into any or all of the elementary-secondary grant formulas. This analysis focuses, for illustrative purposes, on two programs: Chapter 2 Block Grants and Chapter 1 Basic Grants to LEAs.

The particular form of fiscal effort adjustment considered is one in which a specified fiscal effort factor is allowed to influence the distribution of 50 percent of the available funds. Specifically, in the case of the Chapter 2 Block Grant program, where allocations are now based only on state population ages 5-17, the alternative is examined of allocating 50 percent of the available funds according to the mathematical product of population 5-17 and an index of fiscal effort and the remaining 50 percent according to population 5-17 alone. This 50-50 formula was judged to be more realistic than the more drastic alternative of applying the effort adjustment to 100 percent of the available funds.

Effects on Chapter 2 Block Grants. Table 49 shows the effects of allocating Chapter 2 Block Grants in the way just described, using each of the four fiscal effort indicators presented in Table 48.[35] The table indicates, first, that certain states would gain substantially under an effort-based formula, while other states would be adversely affected by such a formula, regardless of how fiscal effort is measured. For instance, Montana, Utah, West Virginia, and Wyoming would receive major increases in aid--15 to 20 percent or more--under all four alternatives represented in the table. Such populous states as Michigan and New York would also come out significantly ahead. But states that fall unambiguously into the low-effort category would lose funds under any reward-for-effort scheme; these include California, the District of Columbia, Hawaii, Illinois, Kentucky, Missouri, Nevada, New Hampshire, and Tennessee. The results for another group of states would depend on how fiscal effort were measured. For example, Louisiana would gain slightly if an income-based effort factor were inserted into the formula but would lose if one of the other effort indicators were chosen; Ohio, in contrast, would lose funds if the effort adjustment were based on income but would gain if it were based on any other indicator. Because the gains or losses of

Table 49

Effects of Basing Rewards for Fiscal Effort on Alternative Effort Definitions: Illustrations Using the Chapter 2 Block Grant Program, Fiscal Year 1989
(Allocations in thousands of dollars)

State	Base Case: Allocation According to Actual Formula but Without 1/2 of 1 Percent Floor	Alternatives: 50 Percent of Funds Allocated in Proportion to Effort Measure Based On: Personal Income		Gross State Product		RTS Capacity		RRS Capacity	
		Allocation	Percentage Change from Base Case	Allocation	Percentage Change from Base Case	Allocation	Percentage Change from Base Case	Allocation	Percentage Change from Base Case
Alabama	8,175	7,896	-3.4	7,990	-2.3	8,174	0.0	8,153	-0.3
Alaska	1,114	1,487	33.5	1,157	3.8	1,269	14.0	996	-10.5
Arizona	6,285	6,241	-0.7	6,314	0.4	6,100	-3.0	6,183	-1.6
Arkansas	4,724	4,495	-4.9	4,505	-4.6	4,597	-2.7	4,616	-2.3
California	49,726	45,138	-9.2	45,586	-8.3	44,816	-9.9	44,917	-9.7
Colorado	6,017	6,332	5.2	6,297	4.6	5,932	-1.4	5,975	-0.7
Connecticut	5,400	5,167	-4.3	5,218	-3.4	5,065	-6.2	5,002	-7.4
Delaware	1,144	1,109	-3.0	1,120	-2.1	1,051	-8.1	1,058	-7.5
District of Columbia	895	812	-9.3	617	-31.0	814	-9.1	813	-9.2
Florida	18,816	17,118	-9.0	18,155	-3.5	16,672	-11.4	16,864	-10.4
Georgia	12,521	12,289	-1.9	11,900	-5.0	12,059	-3.7	12,173	-2.8
Hawaii	1,959	1,741	-11.2	1,783	-9.0	1,719	-12.2	1,745	-10.9
Idaho	2,208	2,267	2.7	2,210	0.1	2,187	-0.9	2,202	-0.3
Illinois	21,621	19,027	-12.0	19,267	-10.9	19,985	-7.6	19,844	-8.2
Indiana	10,741	11,259	4.8	11,284	5.1	11,389	6.0	11,447	6.6
Iowa	5,331	5,617	5.4	5,608	5.2	5,764	8.1	5,747	7.8
Kansas	4,555	4,722	3.7	4,792	5.2	4,877	7.1	4,891	7.4
Kentucky	7,340	6,682	-9.0	6,373	-13.2	6,561	-10.6	6,550	-10.8
Louisiana	9,249	9,464	2.3	8,936	-3.4	9,161	-1.0	8,982	-2.9
Maine	2,188	2,299	5.1	2,376	8.6	2,241	2.4	2,275	4.0
Maryland	7,877	7,589	-3.7	8,179	3.8	7,812	-0.8	7,819	-0.7
Massachusetts	9,418	8,816	-6.4	9,093	-3.5	8,740	-7.2	8,802	-6.5
Michigan	17,852	19,565	9.6	20,256	13.5	20,240	13.4	20,277	13.6
Minnesota	7,837	8,266	5.5	8,212	4.8	8,232	5.0	8,301	5.9
Mississippi	5,768	5,459	-5.4	5,267	-8.7	5,420	-6.0	5,426	-5.9
Missouri	9,348	8,711	-6.8	8,509	-9.0	8,585	-8.2	8,503	-9.0
Montana	1,591	1,954	22.8	1,950	22.5	1,912	20.2	1,916	20.4
Nebraska	3,003	3,081	2.6	2,998	-0.2	3,063	2.0	3,070	2.2
Nevada	1,750	1,633	-6.7	1,511	-13.7	1,376	-21.4	1,413	-19.3
New Hampshire	1,890	1,719	-9.0	1,723	-8.8	1,619	-14.3	1,608	-14.9
New Jersey	13,108	13,200	0.7	13,903	6.1	13,655	4.2	13,377	2.1
New Mexico	3,103	3,485	12.3	3,216	3.6	3,219	3.8	3,039	-2.1
New York	30,959	33,640	8.7	33,192	7.2	34,885	12.7	34,475	11.4
North Carolina	11,825	11,447	-3.2	11,074	-6.3	11,257	-4.8	11,375	-3.8
North Dakota	1,313	1,386	5.5	1,367	4.1	1,342	2.2	1,349	2.7
Ohio	20,517	19,945	-2.8	20,800	1.4	21,159	3.1	21,042	2.6
Oklahoma	6,315	6,298	-0.3	6,144	-2.7	5,780	-8.3	5,880	-6.9
Oregon	4,933	5,305	7.5	5,417	9.8	5,241	6.2	5,268	6.8
Pennsylvania	20,567	21,407	4.1	22,611	9.9	22,448	9.1	22,356	8.7
Rhode Island	1,631	1,610	-1.3	1,690	3.6	1,667	2.2	1,623	-0.5
South Carolina	6,812	7,141	4.8	7,259	6.6	7,127	4.6	7,201	5.7
South Dakota	1,372	1,405	2.3	1,414	3.0	1,429	4.1	1,432	4.3
Tennessee	9,179	7,938	-13.5	7,762	-15.4	7,870	-14.3	7,935	-13.6
Texas	34,629	37,948	9.6	35,294	1.9	35,434	2.3	35,939	3.8
Utah	4,426	5,312	20.0	5,114	15.5	5,195	17.4	5,234	18.3
Vermont	1,004	1,095	9.1	1,081	7.7	1,035	3.1	1,049	4.4
Virginia	10,323	10,016	-3.0	10,106	-2.1	10,227	-0.9	10,248	-0.7
Washington	8,225	8,350	1.5	8,488	3.2	8,576	4.3	8,595	4.5
West Virginia	3,710	4,398	18.6	4,425	19.3	4,277	15.3	4,346	17.2
Wisconsin	9,080	9,614	5.9	9,727	7.1	10,112	11.4	10,074	11.0
Wyoming	1,044	1,742	66.8	1,367	30.9	1,262	20.9	1,231	17.8
Puerto Rico	8,755	8,535	-2.5	8,535	-2.5	8,535	-2.5	8,535	-2.5

these "ambivalent" states would generally be quite small, however--typically in the 2 to 3 percent range--inconsistency among the effort measures, though certainly a factor to be considered, would not by itself be an overwhelming obstacle to implementing a reward-for-effort strategy.

Effects on Chapter 1 Basic Grants. We consider next how adding a fiscal effort factor to the Chapter 1 Basic Grant formula would affect the distribution of that program's funds. In this exercise, the actual FY 1989 allocation of Chapter 1 funds is used as the base case, and the formula is unchanged except by the incorporation of the effort factor itself. Only the effects of an income-based fiscal effort factor are presented in this table, but two different degrees of rewarding effort are considered. In one case (represented in the left-hand portion of the table), the effort factor is allowed to affect the distribution of only half the available funds (as in the Chapter 2 examples presented earlier); in the other, the same type of multiplicative effort factor influences the distribution of all Chapter 1 Basic Grants.

Table 50 shows that the redistributive effects of introducing an effort factor are basically the same in the Chapter 1 case as they were for Chapter 2. The gainers and losers are, by definition, states that spend above-average and below-average amounts on elementary-secondary education relative to their incomes. States like Alaska, Montana, Utah, and Wyoming qualify as "high effort" according to this criterion and receive the largest percentage increases in aid. States like California, Hawaii, Illinois, and New Hampshire show up as "low effort" states and sustain large percentage losses. The biggest gainers in terms of absolute dollars are New York, Texas, and Michigan, while the biggest losers are California and Illinois.

Table 50

Effects of Incorporating an Income-Based Fiscal Effort Factor
into the Formula for Allocating Chapter 1 Basic Grants, Fiscal Year 1989
(Allocations in thousands of dollars)

State	Actual Allocation	Effects of Allocating 50 Percent of Funds in Proportion to Effort			Effects of Allocating 100 Percent of Funds in Proportion to Effort		
		Amount	Difference	Percentage Change	Amount	Difference	Percentage Change
Alabama	81,242	76,349	-4893	-6.0	70,701	-10542	-13.0
Alaska	6,546	9,239	2693	41.1	11,764	5218	79.7
Arizona	42,116	41,065	-1050	-2.5	39,572	-2544	-6.0
Arkansas	45,346	43,268	-2078	-4.6	40,762	-4584	-10.1
California	375,414	342,729	-32685	-8.7	315,709	-59705	-15.9
Colorado	35,237	36,769	1533	4.4	37,849	2612	7.4
Connecticut	41,540	40,524	-1015	-2.4	39,071	-2469	-5.9
Delaware	11,194	10,814	-379	-3.4	10,321	-873	-7.8
District of Columbia	17,220	15,935	-1285	-7.5	14,498	-2722	-15.8
Florida	159,574	146,799	-12774	-8.0	139,266	-20308	-12.7
Georgia	108,587	109,440	853	0.8	109,027	440	0.4
Hawaii	11,535	10,136	-1399	-12.1	10,063	-1472	-12.8
Idaho	11,529	12,027	497	4.3	12,376	846	7.3
Illinois	180,860	158,117	-22743	-12.6	149,957	-30903	-17.1
Indiana	60,888	64,816	3928	6.5	67,914	7026	11.5
Iowa	33,128	35,726	2598	7.8	37,857	4729	14.3
Kansas	25,524	25,965	441	1.7	26,100	576	2.3
Kentucky	68,151	63,437	-4714	-6.9	58,519	-9632	-14.1
Louisiana	90,798	93,362	2564	2.8	94,802	4004	4.4
Maine	18,391	19,623	1232	6.7	20,603	2212	12.0
Maryland	64,860	61,728	-3133	-4.8	57,965	-6896	-10.6
Massachusetts	89,574	82,577	-6997	-7.8	76,674	-12900	-14.4
Michigan	148,843	159,185	10342	7.0	167,473	18630	12.5
Minnesota	46,980	49,800	2821	6.0	51,988	5008	10.7
Mississippi	73,384	69,841	-3544	-4.8	65,605	-7779	-10.6
Missouri	63,326	60,425	-2901	-4.6	56,913	-6413	-10.1
Montana	11,729	14,677	2948	25.1	17,394	5665	48.3
Nebraska	18,877	19,448	571	3.0	19,783	906	4.8
Nevada	7,139	6,547	-591	-8.3	6,370	-768	-10.8
New Hampshire	9,205	8,047	-1158	-12.6	7,773	-1432	-15.6
New Jersey	126,636	128,701	2065	1.6	129,252	2616	2.1
New Mexico	29,820	34,320	4500	15.1	38,327	8507	28.5
New York	410,218	447,487	37269	9.1	478,791	68573	16.7
North Carolina	90,559	86,950	-3609	-4.0	82,437	-8122	-9.0
North Dakota	8,481	9,161	680	8.0	9,721	1240	14.6
Ohio	133,318	130,061	-3257	-2.4	125,402	-7916	-5.9
Oklahoma	37,846	37,505	-341	-0.9	36,749	-1098	-2.9
Oregon	31,976	33,038	1062	3.3	33,698	1722	5.4
Pennsylvania	188,756	196,899	8143	4.3	202,610	13855	7.3
Rhode Island	14,691	14,733	42	0.3	14,607	-84	-0.6
South Carolina	59,767	62,643	2876	4.8	64,738	4971	8.3
South Dakota	11,731	11,981	250	2.1	12,088	357	3.0
Tennessee	79,848	72,099	-7750	-9.7	69,033	-10815	-13.5
Texas	248,600	265,239	16639	6.7	278,481	29882	12.0
Utah	13,809	16,814	3005	21.8	19,557	5748	41.6
Vermont	8,246	9,024	778	9.4	9,680	1435	17.4
Virginia	76,869	75,984	-886	-1.2	74,253	-2616	-3.4
Washington	45,166	43,733	-1433	-3.2	41,882	-3283	-7.3
West Virginia	36,233	40,390	4156	11.5	43,989	7756	21.4
Wisconsin	58,335	62,504	4169	7.2	65,864	7529	12.9
Wyoming	4,766	6,729	1963	41.2	8,580	3814	80.0
Puerto Rico	140,642	140,642	0	0.0	140,642	0	0.0
United States	3,815,050	3,815,050	0	0.0	3,815,050	0	0.0

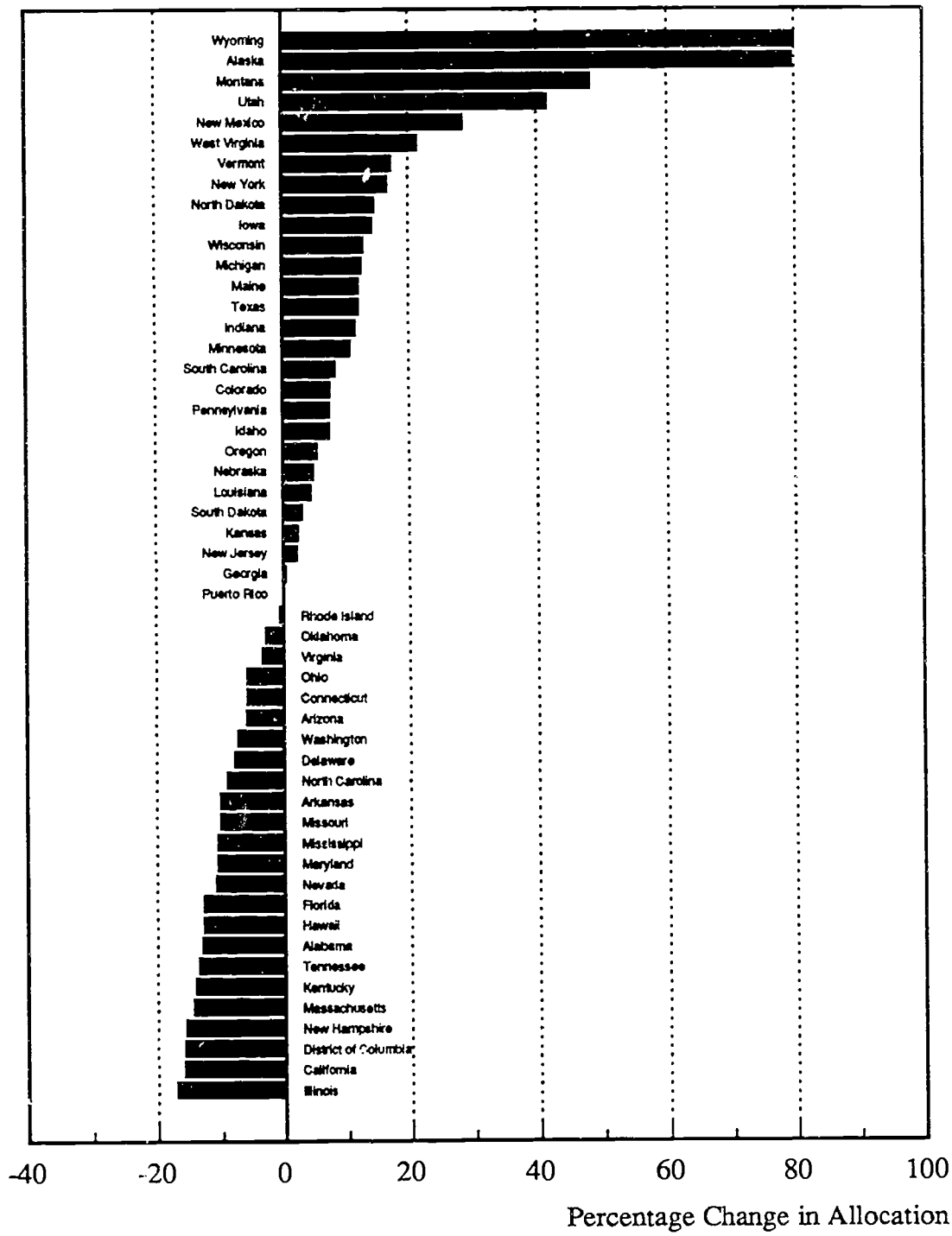
The redistributive effects are relatively moderate when only half the program's funds are influenced by the income factor but become larger--though less than proportionately so--when all funds are made contingent on effort. The effects of the more drastic alternative are shown graphically in Figure 17. Note that the states at the very top of the distribution, Wyoming, Alaska, and Montana, are energy-producing states whose levels of effort tend to be exaggerated by an income-based fiscal effort measure. Note also that although a number of western states are clustered at the top and a number of northeastern states are at the bottom, the redistributive effects do not sort out neatly by region. For instance, New York and Vermont would gain from rewards for effort, while Massachusetts and New Hampshire would lose and Connecticut and New Jersey would be only minimally affected. Similarly, although some western states would be major gainers, California and Nevada would be losers. Unlike some of the other alternatives considered in this report, those involving fiscal effort do not have clear-cut geographical effects.

Effects of Distributing Aid According to a Formula that Takes Both Fiscal Effort and Fiscal Capacity into Account

A major objection to linking aid to effort in the manner just demonstrated is that doing so would make the distribution of federal aid less equitable than it is now. Specifically, because some high-effort states are also wealthy states and some low-effort states are poor states, rewarding effort has the effect of redistributing some funds from the have-nots to the haves. The source of the problem is that the effort adjustments in the foregoing simulations benefit states with above-average education expenditure relative to capacity but do not take state fiscal capacity itself into account. Fortunately, the problem has a remedy. States have developed formulas for use in their own school finance systems, under such rubrics as

Figure 17

Changes in Allocations as a Result of Incorporating an Income-Based Fiscal Effort Factor into the Chapter 1 Formula



"guaranteed yield" or "power equalizing," that simultaneously reward aid recipients for exerting above-average effort, while distributing funds so as to compensate, or "equalize," for differences in revenue-raising ability. These formulas are said to embody the principle of "equal fiscal opportunity," or "equal reward for equal effort." Technically, they are *variable matching formulas* because they distribute funds so as to match the revenues that the grantees raise themselves but at matching rates that vary among states in an inverse relationship to state fiscal capacity. The federal government could use similar formulas to distribute education aid to states.

The specific type of variable matching formula illustrated here allocates Chapter 2 Block Grant funds among states in proportion to the mathematical product,

$$POP517 \times EFFORT \times (MAXPPI - K \times PPI),$$

where *POP517* is a state's school-age population (the factor used in the present Chapter 2 formula); *EFFORT* is the state's fiscal effort to support education (measured, in this case, as state own-source education outlay relative to state personal income); *PPI* is income per pupil, taken here as the measure of fiscal capacity; *MAXPPI* is the highest level of income per pupil found among all the states; and K is a parameter that can be altered to adjust the strength of the redistributive effect.

Such a formula allocates aid to each state in proportion to both the state's fiscal effort and the amount by which the state's fiscal capacity falls short of the capacity of the highest-capacity state. States with lower income per pupil receive more aid per unit of effort than states with higher income per pupil. In the particular version of the formula shown here, K is set equal to 1.0 (a strong equalizing effect), with the result that states with per-pupil income

close to the maximum (*MAXPPI*) receive very little aid, and the state with the highest per-pupil income (Connecticut) receives no aid at all.[36] Many variants of this type of equalizing formula can be constructed. This particular version has been selected, somewhat arbitrarily, to show how such a formula works.

Table 51 and Figure 18 show the drastic redistributive effects of the formula just described. The states that gain the most under this formula are those with both above-average effort and below-average capacity. The largest gainers in percentage terms, Utah, West Virginia, and New Mexico, each receive more than twice as much aid as under the current formula; seven other states gain 50 percent or more, and nine others gain at least 25 percent. At the other end of the scale (and shown at the bottom of the diagram), eight states with the opposite characteristics--high capacity and low effort--have their allocations reduced by 50 percent or more. The members of this group are Connecticut (which loses all its aid), the District of Columbia, Delaware, Maryland, Massachusetts, New Hampshire, New Jersey, and Rhode Island. States with other combinations of fiscal characteristics--low capacity/low effort or high capacity/high effort--gain or lose depending on whether the effort effect or the fiscal capacity effect dominates. Thus, for example, Tennessee essentially breaks even under this formula, because the aid-reducing effect of its low effort is offset by the aid-increasing effect of its low fiscal capacity.

This simulation shows that it is not necessary to choose between a policy of rewarding effort and a policy of distributing aid in an inverse relationship to ability to pay. The two can be combined and implemented with a single formula. Under the type of formula reflected in Table 51, aid decreases with state fiscal capacity, holding effort constant; and aid increases with effort, holding fiscal capacity constant. By manipulating the formula parameters

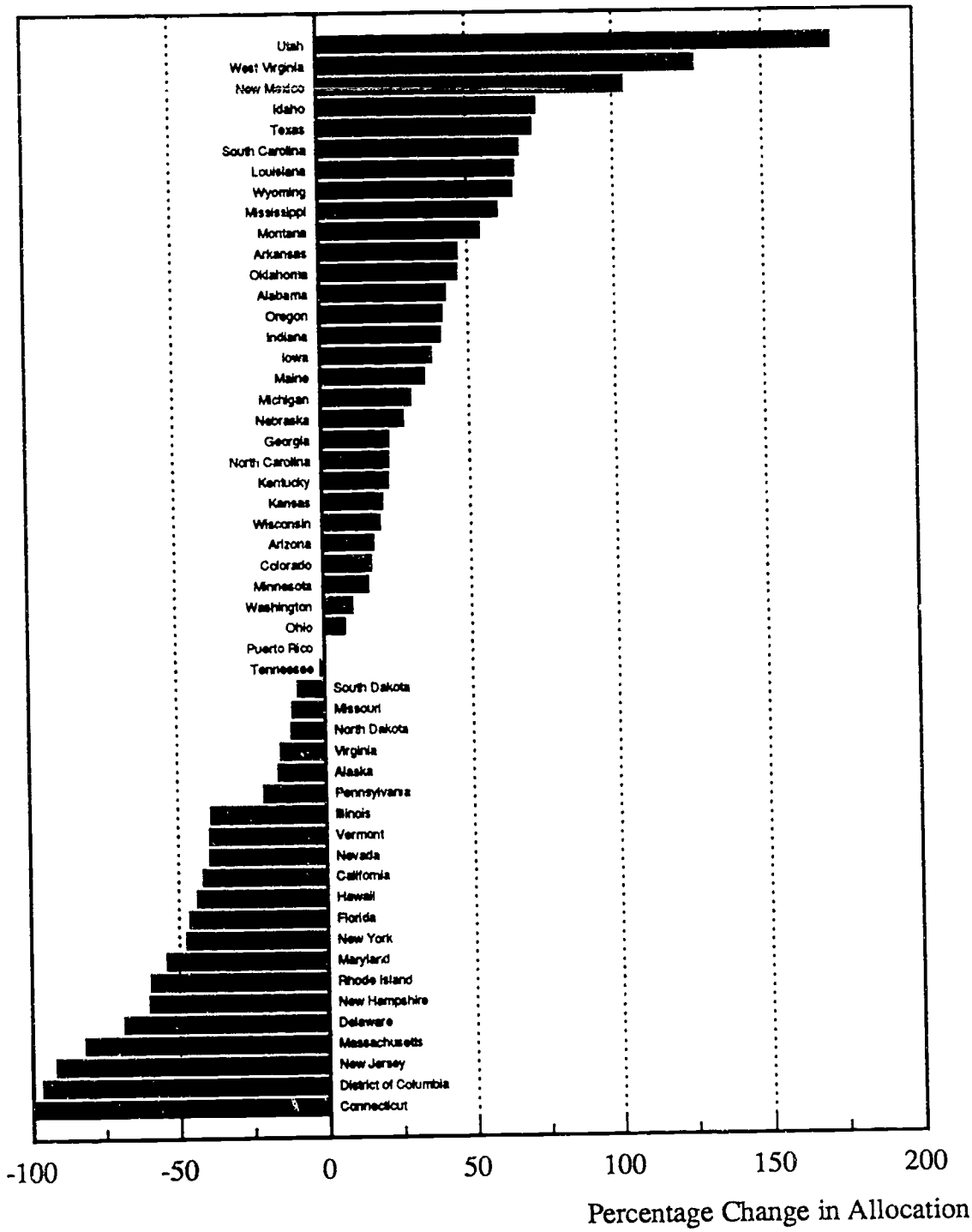
Table 51

Effects of Distributing Chapter 2 Block Grants
According to a Variable Matching Formula, Fiscal Year 1989
(Allocations in thousands of dollars)

State	FY 1989 Base-Case Allocation	Allocation According to Variable Matching Formula	Difference	Percentage Change
Alabama	7,969	11,357	3388	42.5
Alaska	2,296	1,929	-367	-16.0
Arizona	6,127	7,183	1056	17.2
Arkansas	4,605	6,762	2157	46.8
California	48,473	28,394	-20079	-41.4
Colorado	5,865	6,816	951	16.2
Connecticut	5,264	0	-5264	-100.0
Delaware	2,296	733	-1563	-68.1
District of Columbia	2,296	86	-2210	-96.3
Florida	18,342	9,883	-8460	-46.1
Georgia	12,205	14,978	2773	22.7
Hawaii	2,296	1,297	-999	-43.5
Idaho	2,296	3,991	1695	73.8
Illinois	21,076	12,934	-8142	-38.6
Indiana	10,470	14,727	4257	40.7
Iowa	5,196	7,145	1949	37.5
Kansas	4,440	5,336	896	20.2
Kentucky	7,155	8,748	1594	22.3
Louisiana	9,016	15,005	5989	66.4
Maine	2,296	3,099	803	35.0
Maryland	7,678	3,549	-4129	-53.8
Massachusetts	9,181	1,691	-7490	-81.6
Michigan	17,402	22,651	5249	30.2
Minnesota	7,639	8,802	1163	15.2
Mississippi	5,623	9,030	3407	60.6
Missouri	9,113	8,128	-985	-10.8
Montana	2,296	3,544	1248	54.4
Nebraska	2,928	3,735	807	27.6
Nevada	2,296	1,395	-901	-39.2
New Hampshire	2,296	922	-1374	-59.8
New Jersey	12,777	1,077	-11700	-91.6
New Mexico	3,025	6,169	3144	103.9
New York	30,179	15,935	-14244	-47.2
North Carolina	11,527	14,135	2608	22.6
North Dakota	2,296	2,039	-257	-11.2
Ohio	20,000	21,426	1426	7.1
Oklahoma	6,156	9,022	2866	46.6
Oregon	4,809	6,794	1986	41.3
Pennsylvania	20,048	15,869	-4179	-20.8
Rhode Island	2,296	936	-1360	-59.2
South Carolina	6,641	11,159	4518	68.0
South Dakota	2,296	2,088	-208	-9.0
Tennessee	8,948	8,844	-104	-1.2
Texas	33,756	58,178	24422	72.3
Utah	4,314	11,773	7459	172.9
Vermont	2,296	1,396	-900	-39.2
Virginia	10,063	8,551	-1512	-15.0
Washington	8,017	8,795	777	9.7
West Virginia	3,616	8,229	4613	127.6
Wisconsin	8,851	10,569	1718	19.4
Wyoming	2,296	3,803	1507	65.6
Puerto Rico	8,535	8,535	0	0.0
United States	459,171	459,171	0	0.0

Figure 18

Changes in Allocations as a Result of Distributing Chapter 2 Block Grant Funds According to a Variable Matching Formula



(*MAXPPI* and *K*), it is possible to calibrate the formula to achieve the desired balance between the two effects.

Should Effort be Rewarded?

What can be said about the desirability of rewarding state fiscal effort by incorporating the types of effort factors just discussed into education aid formulas? The following considerations seem relevant:

First, although it is feasible to "reward" states for above-average fiscal effort to support education, policymakers should have no illusion that doing so will have any discernible effect on state financial support for elementary and secondary education. The size of the potential reward--at best, one or two cents in additional federal aid to match each incremental state-local dollar (and that only if effort factors are added to the largest federal education aid programs)--is simply too small to significantly influence state and local fiscal decisions.

Second, there is something illogical about using increments in federal funds earmarked for special purposes and populations to reward states for their efforts to support elementary and secondary education in general. Conceivably, the rewards could go to states that exert above-average effort to support their general education programs but do relatively little in the particular fields of education in which the federal government is financially involved. The argument for taking effort into account would be much stronger if effort pertained to state support for programs or pupils of special federal interest. For instance, it would seem reasonable to allocate extra federal aid for the handicapped to states that put forth above-average effort of their own to support special education for handicapped children. However, this more logical alternative is currently infeasible for reasons previously discussed.

Third and finally, rewarding fiscal effort might make the interstate distribution of federal aid less equitable than it is now unless the new effort factors were accompanied by adjustments for state fiscal capacity. The mechanics of adjusting for fiscal capacity and fiscal effort simultaneously have already been outlined, and formulas that do both could be designed for the various federal programs.

Summary

Proposals for taking fiscal effort into account in federal education aid formulas are usually motivated either by equity concerns or by the desire to elicit increased nonfederal funding for educational activities of interest to the federal government. In principle, states could be rewarded for effort to support such specific federally aided programs as vocational education and special education for the handicapped, but in practice, data limitations preclude program-specific effort indicators. Consequently, the only option now available is to reward effort to support education in general.

Multiple indicators of fiscal effort in education can be constructed, corresponding to the different measures of fiscal capacity. Although most states score fairly consistently according to the different indicators, the ratings for some vary substantially with the way effort is measured. The effort indices are distorted, in certain instances, by conceptual flaws in the underlying capacity indices.

Analyses of the effects of incorporating effort factors into the Chapter 2 Block Grant formula and the Chapter 1 Basic Grant formula show that certain unambiguously high-effort states gain and certain unambiguously low-effort states lose regardless of how effort is measured, but that the effects on other states are sensitive to the choice of an effort indicator.

For the most part, the redistributive effects are moderate. There is no distinct geographical pattern to the results; both high-effort and low-effort states can be found in each region.

An important objection to adding effort factors to the formulas--that doing so may redistribute funds from poorer to richer states--can be addressed by using formulas that simultaneously reward effort and compensate for differences in fiscal capacity. These "variable matching" formulas can have radical redistributive effects, but they can also be calibrated to produce milder degrees of fiscal equalization.

ADJUSTMENTS FOR INTERSTATE DIFFERENCES IN COSTS

The rationale for adjusting aid allocations for interstate differences in costs is straightforward and relatively noncontroversial, but no satisfactory state-level cost-of-education indices have been developed, and no factor specifically identifiable as a cost index appears in the existing formulas. It is generally understood, however, that the bounded per-pupil expenditure factor found in all the Chapter 1 formulas was intended by the formula designers to serve as a proxy for the cost of education in each state (Ginsburg, Noell, and Rosenthal, 1985). The questions addressed here, therefore, are (1) how this per-pupil expenditure factor affects the distributions of Chapter 1 funds, (2) how well it serves as a proxy for the cost of education, (3) how substitution of other cost proxies for the per-pupil expenditure factor would alter the Chapter 1 distributions, and (4) what the effects would be of incorporating either the per-pupil expenditure factor or other cost proxies into formulas where no cost adjustment is now attempted.

The Effects of the per-Pupil Expenditure Factor in the Chapter 1 Basic Grant Formula

The Chapter 1 Basic Grant formula, as explained earlier, allocates funds among counties in proportion to the product of the number of eligible low-income children in each county and the official per-pupil expenditure factor for the state. The latter is defined as expenditure per pupil in average daily attendance (ADA), but not less than 80 percent nor more than 120 percent of the U.S. average value of that variable.[37] To assess the effects of the expenditure factor, we first compare fund allocations under the actual Chapter 1 formula with simulated allocations under a formula with the per-pupil expenditure variable eliminated. Then, to determine the importance of the particular way in which the per-pupil expenditure factor is defined, we consider how allocations would be affected if the definition were modified.

The per-pupil expenditure factor substantially alters the distribution of Chapter 1 Basic Grant funds from what it would be if allocations were based only on the number of eligible low-income children in each county. The effects are shown in Table 52, which compares state allotments under the actual Chapter 1 formula with simulated allotments under an otherwise similar formula with the expenditure factor deleted.[38] The pattern of gains and losses from deleting the factor is also shown graphically in Figure 19. Naturally, states at the top and bottom of the per-pupil expenditure range are the most strongly affected by the factor's presence. Those at the low (80 percent) end of the permitted range would each receive 21 percent more Chapter 1 money if there were no expenditure factor in the formula; or, equivalently, the expenditure factor costs each such state 17.5 percent of what it would have received had aid been distributed as a flat amount per eligible pupil. The twelve states in this

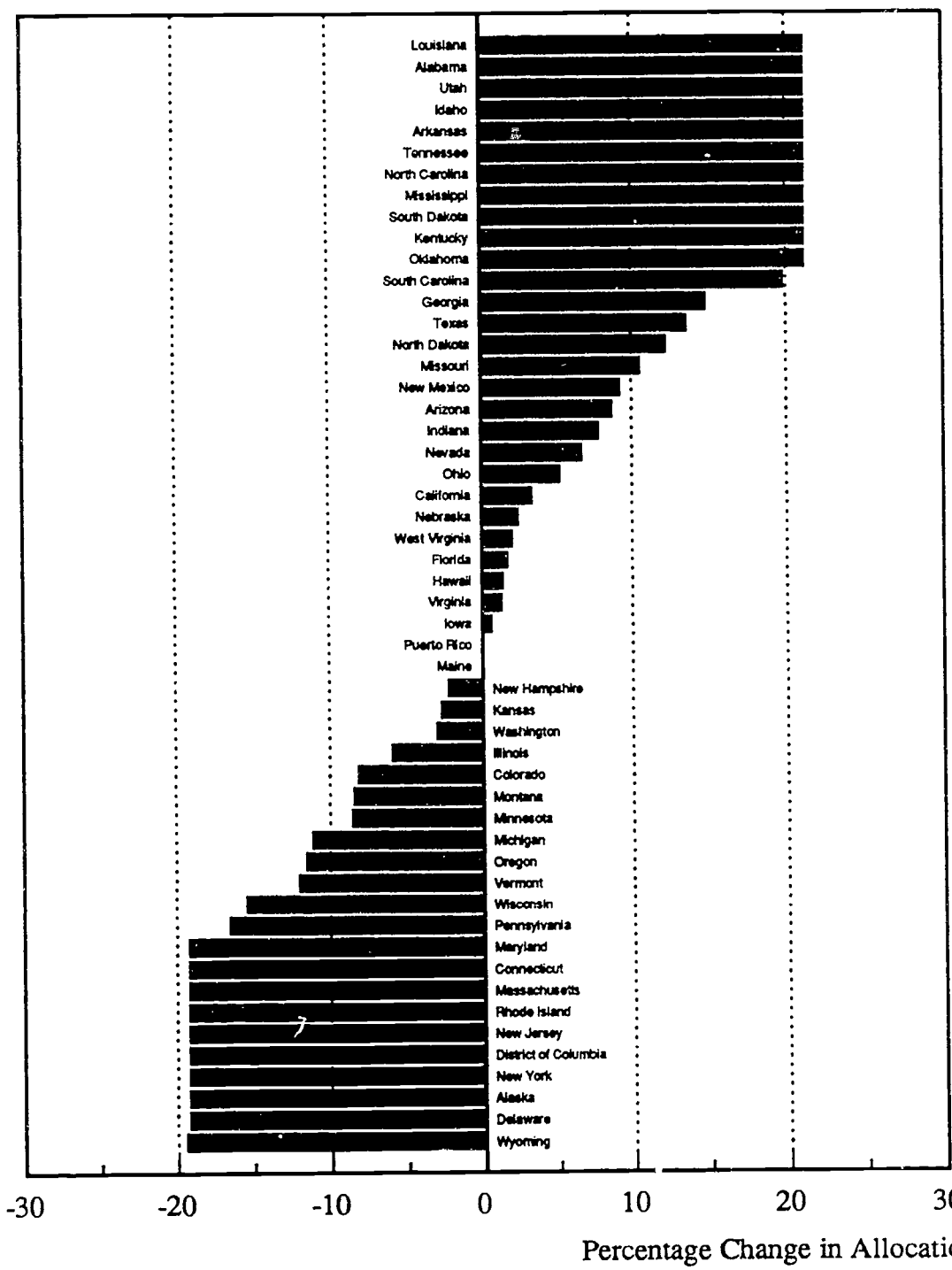
Table 52

Comparison of Chapter 1 Basic Grant Allocations
with and without the per-Pupil Expenditure Factor in
the Formula, Fiscal Year 1989
(Allocations in thousands of dollars)

State	Actual Allocation	Allocation with Per-Pupil Expenditure Factor Deleted	Difference	Percentage Change
Alabama	81,242	98,448	17205	21.2
Alaska	6,546	5,288	-1258	-19.2
Arizona	42,116	45,797	3681	8.7
Arkansas	45,346	54,949	9603	21.2
California	375,414	387,669	12255	3.3
Colorado	35,237	32,381	-2855	-8.1
Connecticut	41,540	33,558	-7982	-19.2
Delaware	11,194	9,043	-2151	-19.2
District of Columbia	17,220	13,911	-3309	-19.2
Florida	159,574	162,282	2708	1.7
Georgia	108,587	124,614	16027	14.8
Hawaii	11,535	11,696	161	1.4
Idaho	11,529	13,971	2442	21.2
Illinois	180,860	170,185	-10674	-5.9
Indiana	60,888	65,639	4751	7.8
Iowa	33,128	33,320	192	0.6
Kansas	25,524	24,832	-692	-2.7
Kentucky	68,151	82,584	14433	21.2
Louisiana	90,798	110,027	19229	21.2
Maine	18,391	18,389	-2	0.0
Maryland	64,860	52,398	-12463	-19.2
Massachusetts	89,574	72,363	-17212	-19.2
Michigan	148,843	132,358	-16485	-11.1
Minnesota	46,980	42,978	-4001	-8.5
Mississippi	73,384	88,926	15541	21.2
Missouri	63,326	69,976	6650	10.5
Montana	11,729	10,739	-991	-8.4
Nebraska	18,877	19,323	446	2.4
Nevada	7,139	7,615	476	6.7
New Hampshire	9,205	9,005	-200	-2.2
New Jersey	126,636	102,303	-24333	-19.2
New Mexico	29,82?	32,557	2736	9.2
New York	410,218	331,395	-78823	-19.2
North Carolina	90,559	109,737	19178	21.2
North Dakota	8,481	9,513	1032	12.2
Ohio	133,318	140,216	6899	5.2
Oklahoma	37,846	45,851	8005	21.2
Oregon	31,976	28,300	-3675	-11.5
Pennsylvania	188,756	157,687	-31069	-16.5
Rhode Island	14,691	11,868	-2823	-19.2
South Carolina	59,767	71,611	11843	19.8
South Dakota	11,731	14,216	2484	21.2
Tennessee	79,848	96,758	16910	21.2
Texas	248,600	282,416	33816	13.6
Utah	13,809	16,734	2924	21.2
Vermont	8,246	7,257	-989	-12.0
Virginia	76,869	77,879	1009	1.3
Washington	45,166	43,801	-1365	-3.0
West Virginia	36,233	36,948	715	2.0
Wisconsin	58,335	49,348	-8987	-15.4
Wyoming	4,766	3,842	-924	-19.4
Puerto Rico	140,642	140,642	0	0.0
United States	3,815,050	3,815,050	0	0.0

Figure 19

Changes in Allocations as a Result of Deleting the per-Pupil Expenditure Factor from the Chapter 1 Formula



group include nine southern states plus Idaho, South Dakota, and Utah. The state that loses the most in absolute terms because of the expenditure factor is Texas ($33.8 million), but eight other states--Alabama, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, and Tennessee--each lose between $10 and $20 million. Meanwhile, each state at the high (120 percent) end of the expenditure scale receives 24 percent more aid because of the per-pupil expenditure factor than it would have received otherwise; or, putting it differently, each would lose 19 percent of its current allotment if the expenditure factor were eliminated. The main beneficiaries from the factor (in percentage terms) are eight northeastern states--Connecticut, Delaware, the District of Columbia, Maryland, Massachusetts, New Jersey, New York, and Rhode Island--plus Alaska and Wyoming. New York gains by far the most in absolute terms ($78 million), followed by Pennsylvania and New Jersey ($33 million and $24 million, respectively). In the aggregate, the per-pupil expenditure factor redistributes $233 million, or 6.1 percent of Chapter 1 Basic Grant funds, mainly from relatively low-income states in the South to relatively high-income states in the Northeast.

Effects of the Particular Manner in Which the per-Pupil Expenditure Factor Is Defined

The effects of adjusting for per-pupil spending reflect in part the particular way in which the adjustment for per-pupil expenditure is defined. Two aspects of that definition are examined here: (1) that the factor is bounded at 80 percent and 120 percent of U.S. average per-pupil expenditure and (2) that it is defined as expenditure per pupil in average daily attendance rather than as expenditure per pupil in membership or per pupil enrolled.

The 80 percent and 120 percent bounds reduce the range of variation in the per-pupil expenditure factor to a minor fraction of what it would be otherwise. The actual range in

expenditure per pupil in ADA among states in 1987-88 was from about 56 percent of the national average (Mississippi) to 163 percent of the national average (New York), a ratio of almost 3 to 1 (excluding Alaska, which spent 204 percent of the U.S. average). The rationale for setting the 80 and 120 percent limits, according to Ginsburg, Noell, and Rosenthal (1985, p. 367), was that doing so "controls for extreme differences in expenditure that might more properly be attributed to differences in state fiscal capacity than to the costs of education." The specific 80 and 120 percent bounds were selected, according to the same authors, to "bring this cost factor closer to the dispersion of teacher salaries across states" (ibid., p. 370). Whether the resulting bounded per-pupil expenditure factor is a valid proxy for the cost of education is discussed later; for the moment, we consider only the allocative effects.

Table 53 shows how the distribution of Chapter 1 Basic Grants would differ from the current one if the per-pupil expenditure factor were unbounded. As can be seen, some of the high-income, high-spending states would receive substantially more aid than under the existing formula, and some of the low-income, low-spending states would receive substantially less. Alaska's allocation, for example, would be 65 percent larger than it is now, New York would receive 32 percent more aid ($131 million), and New Jersey and the District of Columbia would receive 22 and 16 percent more, respectively. But Mississippi would lose 32 percent of its funds; Utah would lose 26 percent; and the states of Alabama, Arkansas, Idaho, Kentucky, and Tennessee would sustain losses ranging from 15 to 23 percent of their current allotments. It can be said, therefore, that the 80 and 120 percent bounds exert an important moderating effect on the tendency of the per-pupil expenditure factor to shift funds away from the poorer and toward the richer state:

Table 53

Effects on Allocations of Chapter 1 Basic Grants
of Deleting the 80 Percent and 120 Percent
Bounds on the per-Pupil Expenditure Factor, Fiscal Year 1989
(Allocations in thousands of dollars)

State	Actual Allocation	Allocation with 88 percent and 120 percent Bounds Deleted	Difference	Percentage Change
Alabama	81,242	62,692	-18551	-22.8
Alaska	6,546	10,778	4232	64.7
Arizona	42,116	40,779	-1337	-3.2
Arkansa	45,346	37,175	-8171	-18.0
Califoria	375,414	363,500	-11914	-3.2
Colorado	35,237	34,106	-1131	-3.2
Connecticut	41,540	46,324	4784	11.5
Delaware	11,194	10,882	-311	-2.8
District of Columbia	17,220	19,921	2701	15.7
Florida	159,574	154,510	-5064	-3.2
Georgia	108,587	105,141	-3446	-3.2
Hawaii	11,535	11,169	-366	-3.2
Idaho	11,529	9,037	-2492	-21.6
Illinois	180,860	175,120	-5740	-3.2
Indiana	60,888	58,955	-1932	-3.2
Iowa	33,128	32,077	-1051	-3.2
Kansas	25,524	24,706	-818	-3.2
Kentucky	68,151	55,828	-12323	-18.1
Louisiana	90,798	83,068	-7731	-8.5
Maine	18,391	17,807	-584	-3.2
Maryland	64,860	63,016	-1845	-2.8
Massachusetts	89,574	93,786	4211	4.7
Michigan	148,843	144,119	-4724	-3.2
Minnesota	46,980	45,489	-1491	-3.2
Mississippi	73,384	49,813	-23571	-32.1
Missouri	63,326	61,316	-2010	-3.2
Montana	11,729	11,352	-377	-3.2
Nebraska	18,877	18,278	-599	-3.2
Nevada	7,139	6,912	-227	-3.2
New Hampshire	9,205	8,913	-292	-3.2
New Jersey	126,636	154,024	27388	21.6
New Mexico	29,820	28,872	-948	-3.2
New York	410,218	541,091	130873	31.9
North Carolina	90,559	85,963	-4596	-5.1
North Dakota	8,481	8,205	-276	-3.3
Ohio	133,318	129,087	-4231	-3.2
Oklahoma	37,846	35,752	-2094	-5.5
Oregon	31,976	30,961	-1015	-3.2
Pennsylvania	188,756	182,765	-5990	-3.2
Rhode Island	14,691	14,919	228	1.6
South Carolina	59,767	57,871	-1897	-3.2
South Dakota	11,731	10,952	-779	-6.6
Tennessee	79,848	68,207	-11642	-14.6
Texas	248,600	240,689	-7911	-3.2
Utah	13,809	10,233	-3576	-25.9
Vermont	8,246	7,984	-262	-3.2
Virginia	76,869	74,430	-2440	-3.2
Washington	45,166	43,703	-1463	-3.2
West Virginia	36,233	35,083	-1150	-3.2
Wisconsin	58,335	56,483	-1852	-3.2
Wyoming	4,766	5,083	317	6.6
Puerto Rico	140,642	136,125	-4517	-3.2
United States	3,815,050	3,815,050	0	0.0

In comparison, the second feature considered here, that the per-pupil expenditure factor is based on the number of pupils in average daily attendance (ADA) rather than on the number enrolled, has only minor allocative effects. This feature earned a certain notoriety, however, when it was cited in a report of the Education Department's Inspector General (IG) as a source of inequity in the distribution of Chapter 1 funds. As the IG report (U.S. Department of Education, 1989) notes correctly, states are not required to report ADA according to a standard federal definition but are free to use definitions of their own, and both these definitions and actual reporting practices vary significantly among states.[39] The IG recommends changing the denominator in expenditure per pupil from ADA to fall enrollment to enhance the interstate comparability of the per-pupil expenditure factor (ibid., p. 14).

Switching from expenditure per ADA to expenditure per pupil enrolled would have modest but not negligible effects on the interstate distribution of Chapter 1 funds. In general, states with low attendance rates (low ADA relative to enrollment) would gain from the change, while states with high attendance rates would lose. As shown in Table 54, the largest effect would be on California, which would receive 7.3 percent more Chapter 1 aid ($27.5 million) than it receives currently if per-pupil expenditure were computed relative to enrollment rather than to ADA. California's gain would be roughly offset by decreases of $20.4 million and $9.9 million in aid to New York and Illinois, respectively. Seven other states would lose 4 percent or more of their funds, but only three, other than California, would gain by as much as 3 percent. A total of about $54 million, or 1.4 percent of Basic Grant funds, would be shifted from one state to another.

An odd aspect of the ADA-versus-enrollment issue is that the state that loses the most under the present ADA-based definition, California, does so by its own choice. According to

Table 54

Effects on Allocations of Chapter 1 Basic Grants
of Computing Expenditure per-Pupil Relative to Enrollment Rather than ADA
Fiscal Year 1989
(Allocations in thousands of dollars)

State	Actual Allocation	Allocation Based on Enrollment Rather than ADA	Difference	Percentage Change
Alabama	81,242	83,650	2407	3.0
Alaska	6,546	6,469	-77	-1.2
Arizona	42,116	41,479	-637	-1.5
Arkansas	45,346	46,205	860	1.9
California	375,414	402,949	27535	7.3
Colorado	35,237	35,138	-98	-0.3
Connecticut	41,540	43,130	1590	3.8
Delaware	11,194	11,030	-164	-1.5
District of Columbia	17,220	16,648	-572	-3.3
Florida	159,574	155,268	-4306	-2.7
Georgia	108,587	108,781	194	0.2
Hawaii	11,535	11,500	-35	-0.3
Idaho	11,529	11,715	186	1.6
Illinois	180,860	170,961	-9899	-5.5
Indiana	60,888	60,022	-866	-1.4
Iowa	33,128	33,962	833	2.5
Kansas	25,524	24,928	-596	-2.3
Kentucky	68,151	66,812	-1339	-2.0
Louisiana	90,798	91,371	573	0.6
Maine	18,391	18,657	266	1.4
Maryland	64,860	61,455	-3405	-5.3
Massachusetts	89,574	85,909	-3665	-4.1
Michigan	148,843	150,414	1571	1.1
Minnesota	46,980	47,757	778	1.7
Mississippi	73,384	74,753	1368	1.9
Missouri	63,326	62,241	-1085	-1.7
Montana	11,729	11,669	-60	-0.5
Nebraska	18,877	19,336	459	2.4
Nevada	7,139	6,879	-260	-3.6
New Hampshire	9,205	9,043	-162	-1.8
New Jersey	126,636	129,134	2498	2.0
New Mexico	29,820	27,482	-2338	-7.8
New York	410,218	389,838	-20380	-5.0
North Carolina	90,559	92,586	2028	2.2
North Dakota	8,481	8,456	-25	-0.3
Ohio	133,318	134,610	1293	1.0
Oklahoma	37,846	38,822	976	2.6
Oregon	31,976	30,736	-1240	-3.9
Pennsylvania	188,756	191,307	2551	1.4
Rhode Island	14,691	14,546	-145	-1.0
South Carolina	59,767	59,683	-84	-0.1
South Dakota	11,731	11,964	233	2.0
Tennessee	79,848	80,819	971	1.2
Texas	248,600	248,781	181	0.1
Utah	13,809	13,706	-104	-0.8
Vermont	8,246	8,315	69	0.8
Virginia	76,869	77,798	928	1.2
Washington	45,166	44,877	-288	-0.6
West Virginia	36,233	37,187	954	2.6
Wisconsin	58,335	56,088	-2247	-3.9
Wyoming	4,766	4,957	191	4.0
Puerto Rico	140,642	143,229	2587	1.8
United States	3,815,050	3,815,050	0	0.0

the standard NCES definition and the definitions used (or approximated) by most states, ADA is the average of the number of pupils attending school on each day of the school year.[40] California, however, includes excused absentees along with pupils actually in school in its count of "attendees." This practice inflates California's ADA, making it almost equivalent to enrollment, and depresses its per-pupil expenditure figure, causing the state to lose about 7 percent of its federal Chapter 1 funds. Why this situation persists is something of a mystery, because California presumably could decide at any time to report ADA according to the NCES definition and so to claim a larger aid entitlement. Therefore, Table 54 can be said to exaggerate the effects of a change from ADA to enrollment, because fully half the distributional effect shown in the table is due to California's idiosyncratic method of reporting rather than to the formula design.

Is the per-Pupil Expenditure Factor a Valid Proxy for Cost?

Because the per-pupil expenditure factor plays a key role in the Chapter 1 formula, it is appropriate to inquire in some depth into how well this factor serves as a proxy for the cost of education. Ideally, this factor should be compared against a true interstate cost-of-education index, but because no such index exists, that approach is foreclosed. (If such an index existed, the exercise would be unnecessary, as the "true" index could be used in the formula instead of the present proxy.) The option remains, however, of examining relationships between the Chapter 1 per-pupil expenditure factor and other cost proxies and then using information about the properties of such proxies to infer whether the Chapter 1 factor appears to vary among states in a reasonable pattern and by reasonable amounts. Specifically, two alternative cost proxies are considered here: one is an index based on average teacher salaries; the other, an index based on the average private-sector wage. Before

comparing either with the official per-pupil expenditure factor, we consider how each would be expected to relate to, and deviate from, a true cost-of-education index.

Teacher salary payments account for a major share of elementary-secondary education outlays, and so it is not surprising that average teacher salary is frequently suggested as a rough indicator of relative education costs. If we make the reasonable assumptions that (1) salaries of other professional staff (administrators, supervisors, psychologists, librarians, etc.) are highly correlated with salaries of teachers and (2) fringe benefits are highly correlated with salaries, it can be argued that average teacher salary is a proxy not only for the cost of teachers but also for all costs of professional staff compensation--perhaps 75 percent of the typical education budget. Making the further heroic assumption that the remainder of the education budget is expended for items whose costs do not vary much among states (materials, equipment, utilities, etc.), we use as one of our two state-level cost proxies the index

$$COST1 = .25 + .75(TCHSAL/USTCHSAL),$$

where *TCHSAL* is the average teacher salary in a state and *USTCHSAL* is the average teacher salary in the nation.[41]

Apart from being highly oversimplified (not distinguishing among different categories of nonteacher resources, etc.), this index has a major conceptual flaw important to the analysis: it rests on the untenable premise that teachers in all states are essentially of the same average quality and that, consequently, interstate differences in average salaries can be taken as differences in the prices of equivalent educational resources. This premise is obviously incorrect insofar as average levels of teacher experience and teacher training (attributes

rewarded explicitly in teacher salary schedules) vary among states; but more important, it is also incorrect to the extent that some states pay higher salaries than others specifically to attract and retain teachers of relatively high quality. To the extent that higher salaries are associated with higher quality, an index based on average teacher salary *exaggerates* the degree of interstate variation in costs. That is, some of the apparent variation in cost is really variation in quality. It follows that deviations from the national mean of individual states' scores on this index tend to *overstate* the true deviations of the states' costs of education from the national-average cost of education. In other words, the teacher salary index defines a kind of rough outer bound on the variations we should expect to see in a valid cost-of-education index.[42]

Recognizing that a teacher salary index may confound variations in teacher prices with variations in teacher quality, some analysts have suggested the alternative of using a general state wage index as a rough cost proxy for the staff component of the education budget. Accordingly, we take as our second proxy measure the index

$$COST2 = .25 + .75(WAGE/USWAGE),$$

where *WAGE* is the average private-sector wage in a state and *USWAGE* is the average private-sector wage in the nation.[43] This index reflects, by definition, factors that cause wages in general to vary among states. Because the education sector must compete with other sectors of the economy for personnel, salaries in education will be positively correlated with general wage levels. The private-sector wage index obviously does not reflect factors that influence the salaries of teachers differently from the wages of workers in general, such as job conditions in teaching, the strength of teachers' unions, and the supply-demand balance in

each state's teacher market. But it is not subject to the criticism that it reflects interstate differences in teacher attributes and teacher quality, so it offers an independent, second standard of reference against which the Chapter 1 per-pupil expenditure factor can be compared.

Comparisons between the Chapter 1 per-pupil expenditure factor and the aforesaid two cost proxies are presented in Table 55 and Figure 20. The diagram arrays the states in order of increasing expenditure per pupil in ADA. For each state, it shows the Chapter 1 per-pupil expenditure factor (in index form, with the U.S. average value set at 100) and the indices based on average teacher salaries and private-sector wages. Horizontal lines have been drawn between the points representing each state's scores on the teacher salary index and the private wage index to indicate the range demarcated by the two proxy measures.

The diagram brings out several important aspects of the relationship between the per-pupil expenditure factor and the two rough cost proxies. Three such aspects are noteworthy:

First, there is more interstate variation in the per-pupil expenditure factor than in either of the cost proxies.[44] The significance of this, considering that the index based on teacher salaries *exaggerates* the degree to which education costs differ among the states, is that the Chapter 1 per-pupil expenditure factor exaggerates them even more. In other words, the teacher salary index varies more widely among states than a true cost-of-education index would, and the official formula factor varies more widely than the teacher salary index. It follows that the per-pupil expenditure factor varies too widely among states to represent cost-of-education differences correctly.[45]

Second, of the 12 low-income, mostly southern states that score at or near the bottom of the bounded per-pupil expenditure index, all but 3 score higher according to both cost

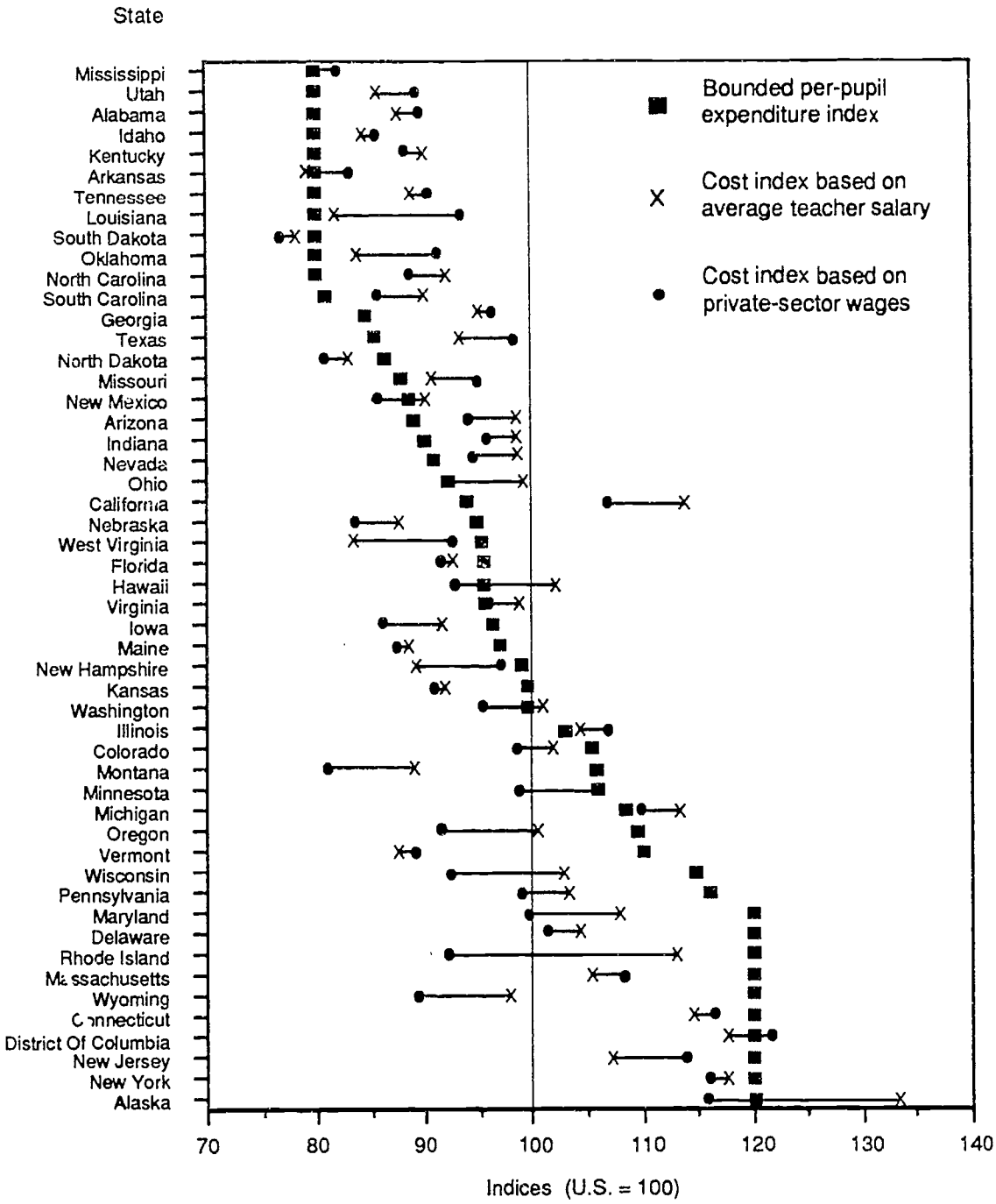
Table 55

Indices of per-Pupil Expenditure,
Teachers' Salary, and General Wages

State	Indices (U.S. = 100)			
	Per-Pupil Expenditure	Bounded per-Pupil Expenditure (Chapter 1 Formula Factor)	Average Teacher Salary	General Private-Sector Wages
Alabama	63.8	80.0	87.4	89.5
Alaska	204.1	120.0	133.1	115.6
Arizona	89.2	89.2	98.3	93.8
Arkansas	67.7	80.0	79.4	83.0
California	93.9	93.9	113.7	107.2
Colorado	105.5	105.5	101.6	98.2
Connecticut	138.2	120.0	114.6	116.0
Delaware	120.5	120.0	104.1	101.2
District of Columbia	143.4	120.0	117.8	121.4
Florida	95.3	95.3	92.4	91.1
Georgia	84.5	84.5	95.0	96.0
Hawaii	95.6	95.6	102.0	92.3
Idaho	64.8	80.0	84.5	85.6
Illinois	103.0	103.0	104.3	106.8
Indiana	89.9	89.9	98.2	95.7
Iowa	96.4	96.4	91.5	85.9
Kansas	99.6	99.6	90.9	90.9
Kentucky	67.7	80.0	89.9	88.5
Louisiana	75.6	80.0	81.7	93.2
Maine	97.0	97.0	87.7	87.4
Maryland	120.4	120.0	107.7	100.0
Massachusetts	129.8	120.0	105.3	108.3
Michigan	109.0	109.0	113.1	109.4
Minnesota	106.0	106.0	105.0	98.2
Mississippi	56.1	80.0	80.3	81.6
Missouri	87.7	87.7	91.1	94.9
Montana	105.8	105.8	88.6	80.9
Nebraska	94.7	94.7	87.2	83.5
Nevada	90.9	90.9	98.8	94.1
New Hampshire	99.1	99.1	89.4	97.0
New Jersey	150.7	120.0	107.2	113.8
New Mexico	88.8	88.8	90.1	85.8
New York	163.5	120.0	117.3	116.2
North Carolina	78.4	80.0	91.6	88.8
North Dakota	86.4	86.4	82.9	80.8
Ohio	92.2	92.2	98.8	99.1
Oklahoma	78.1	80.0	83.9	91.2
Oregon	109.5	109.5	100.0	91.4
Pennsylvania	116.0	116.0	103.0	98.6
Rhode Island	125.9	120.0	112.9	92.3
South Carolina	80.9	80.9	89.8	85.8
South Dakota	77.1	80.0	77.8	76.6
Tennessee	70.6	80.0	88.6	90.4
Texas	85.3	85.3	93.6	98.4
Utah	61.2	80.0	85.5	89.1
Vermont	110.2	110.2	87.6	88.7
Virginia	95.7	95.7	98.4	95.7
Washington	99.9	99.9	100.2	95.1
West Virginia	95.1	95.1	83.1	92.7
Wisconsin	114.6	114.6	102.6	92.1
Wyoming	132.5	120.0	97.9	89.4
50 States + D.C.	100.0	100.0	100.0	100.0

Figure 20

Relationship to Chapter 1 per-Pupil Expenditure Factor to Cost Indices Based on Teachers' Salaries and Private Sector Wages



proxies. Considering, once again, that the index of average teacher salary probably *overstates* the degree to which education costs in these states fall below the national average, it follows that the per-pupil expenditure factor overstates it even more. That is, the values of the official Chapter 1 formula factor for most of these states are *too low* to be valid estimates of the states' relative education costs.

Third, of the 12 high-income, mostly northeastern states that score at or near the upper bound of the per-pupil expenditure factor, all but two score lower according to both cost proxies; some even fall below the national average on the teacher salary index or the index of private-sector wages. Considering that the index of average teacher salary probably *exaggerates* education costs for these states, the implication is that values of the expenditure factor for most of these states are *too high* to be reasonable estimates of the states' relative education costs.

Moreover, Figure 20 shows that these discrepancies are major rather than minor in some important instances. Consider the following cases:

- *California* would be classified as a "low cost" state according to the official formula factor, but it has the fourth-highest teacher salaries and the eighth-highest private-sector wages in the country. The reason is clear: California, bound by self-imposed fiscal constraints, exerts unusually low fiscal effort to support education, and low fiscal effort is confounded with low cost under the per-pupil expenditure criterion.

- Both *Georgia* and *Texas*, which fall only slightly below the U.S. average in teacher salary and private-sector wages, are rated as much lower cost states according to the per-pupil expenditure factor. In these instances, relatively low fiscal capacity per pupil is misconstrued as evidence of low costs.

- The states of *Maine* and *Kansas* are about average on the per-pupil expenditure scale but significantly below average in both teacher salaries and private wages; the states of *Wisconsin* and *Oregon* are both well above average on the expenditure scale but only average or below on the salary and wage indices.

In all four cases, it is above-average fiscal effort that accounts for the discrepancy between the expenditure indicator and the other cost proxies.

- The states of *Vermont*, *Montana*, and *Wyoming* rank relatively high on the per-pupil expenditure scale but have below-average costs according to the teacher salary and private wage criteria. In these instances, above-average fiscal effort or fiscal capacity registers incorrectly on the per-pupil expenditure scale as above-average cost.[46]

- Finally, *Pennsylvania*, *Maryland*, and *Delaware* rank at or near the top of the per-pupil expenditure scale but have only slightly above-average teacher salaries and private wages. Again, various combinations of high fiscal capacity or fiscal effort rather than high cost account for their expenditure rankings.

In sum, the official per-pupil expenditure factor deviates significantly and systematically from being a valid interstate cost-of-education index. It underestimates costs of education in many of the lower-income states (and California) and overestimates costs in the high-income, high-spending states. In consequence, states in the former group receive less Chapter 1 aid, and those in the latter group receive more Chapter 1 aid, than would be due them under a formula with a more valid cost adjustment factor. Although the per-pupil expenditure factor has been constrained to have about the same overall dispersion as an index of average teacher salary, this limitation alone is insufficient to produce a valid cost proxy. The basic flaw of the expenditure factor, that it confounds differences in costs with differences in fiscal capacity and effort, cannot be remedied merely by restricting its range.

The Effects of Substituting Alternative Cost Proxies for the Chapter 1 per-Pupil Expenditure Factor

Although neither the index based on average teacher salary nor the index based on private-sector wages qualifies as a valid education cost indicator, either has more face validity as a cost measure than the per-pupil expenditure factor. We consider, therefore, how the distribution of Chapter 1 funds would be changed if each of these alternative indices were

incorporated into the present formula. No endorsement of either index is intended or should be inferred from this exercise. The results do convey an impression, however, of both the directions in which many state allocations would change and the likely general magnitudes of change if a closer-to-valid cost-of-education index were substituted for the present cost proxy.

Table 56 shows how aid would be redistributed if either the teacher salary index or the private-sector wage index were substituted for the per-pupil expenditure factor. Figure 21 depicts the pattern of gains and losses associated with the teacher salary option. The results are easily anticipated from the foregoing discussion of cost indices. The states whose costs are most clearly underestimated by the present per-pupil expenditure factor--California, Texas, and many southern states--would benefit from a shift to either of the alternative indices. The states whose education costs appear to be overestimated by the present factor--Iowa, Kansas, Nebraska, Montana, Wyoming, and many northeastern states--would receive less Chapter 1 money. The losses to some states would exceed 20 percent. If the per-pupil expenditure factor were replaced by the teacher salary index, 15 states would each lose at least 10 percent of their Chapter 1 funds. Except for California, which would be the biggest gainer by far in both absolute and relative terms, the percentage gains would generally be more moderate. Although the results differ somewhat depending on whether it is the teacher salary index or the general private-sector wage index that replaces per-pupil spending, the overall effects of both alternatives are similar. It is important to keep in mind that the results in Table 56 do not necessarily indicate how particular states would be affected by adjustments based on a true cost-of-education index. These results probably do convey a reasonably accurate impression, however, of how the overall interstate distribution would be altered.

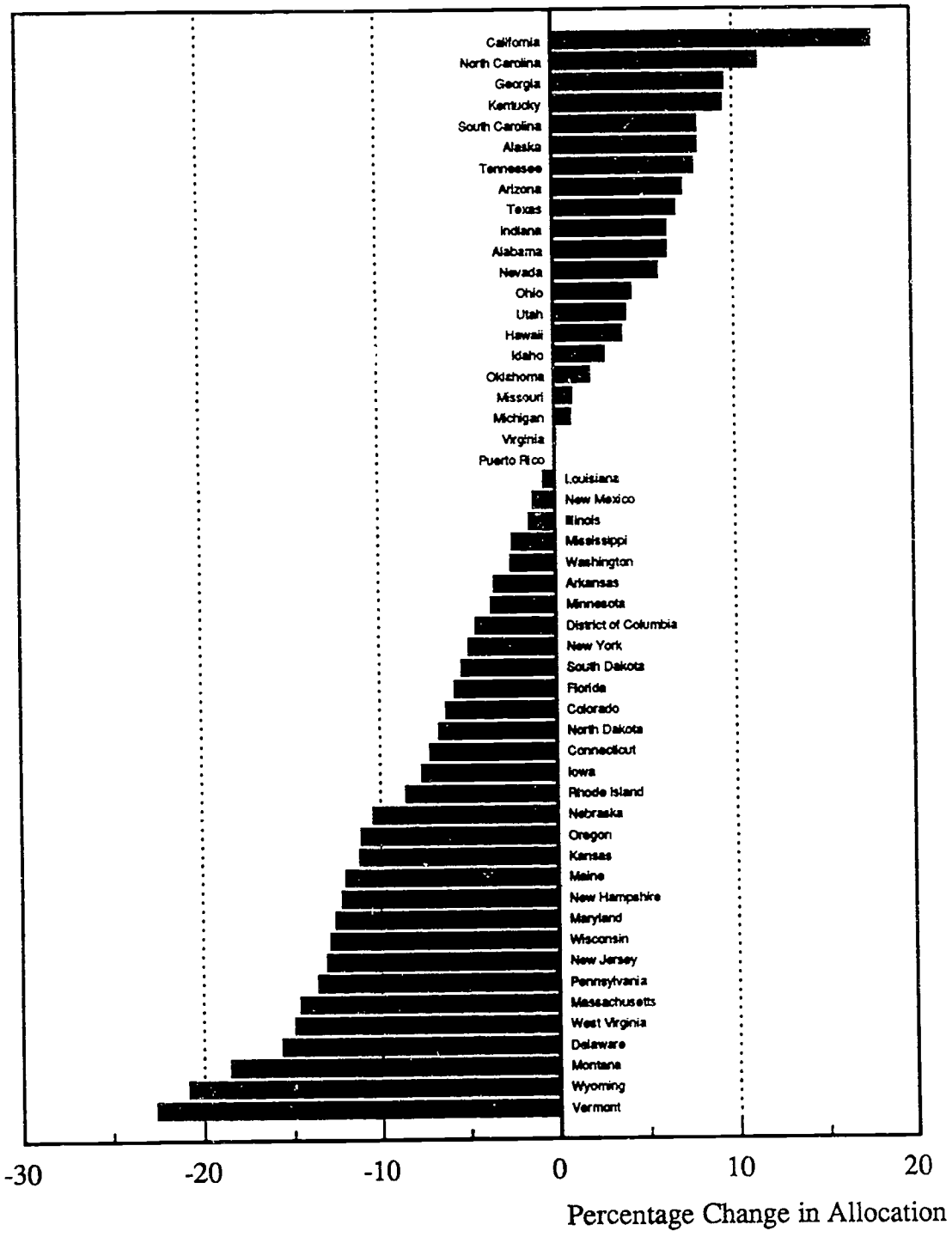
Table 56

Effects on Allocations of Chapter 1 Basic Grants of Substituting Alternative Cost Indices for the Present Per-Pupil Expenditures Factor, Fiscal Year 1989 (Allocations in thousands of dollars)

State	Actual Allocation	Allocation with Cost Index Based on Average Teacher Salary			Allocation with Cost Index Based on Private-Sector Wages		
		Amount	Difference	Percentage Change	Amount	Difference	Percentage Change
Alabama	81,242	86,342	5099	6.3	89,077	7835	9.6
Alaska	6,546	7,066	520	8.0	6,176	-369	-5.6
Arizona	42,116	45,167	3051	7.2	43,405	1289	3.1
Arkansas	45,346	43,796	-1550	-3.4	46,095	749	1.7
California	375,414	442,399	66985	17.8	420,077	44663	11.9
Colorado	35,237	33,034	-2203	-6.3	32,116	-3121	-8.9
Connecticut	41,540	38,591	-2949	-7.1	39,346	-2194	-5.3
Delaware	11,194	9,449	-1744	-15.6	9,245	-1949	-17.4
District of Columbia	17,220	16,452	-767	-4.5	17,060	-159	-0.9
Florida	159,574	150,508	-9065	-5.7	149,415	-10159	-6.4
Georgia	108,587	118,848	10261	9.5	120,897	12310	11.3
Hawaii	11,535	11,973	439	3.8	10,913	-622	-5.4
Idaho	11,529	11,849	319	2.8	12,089	559	4.9
Illinois	180,860	178,238	-2621	-1.5	183,667	2808	1.6
Indiana	60,888	64,732	3845	6.3	63,495	2607	4.3
Iowa	33,128	30,607	-2521	-7.6	28,908	-4220	-12.7
Kansas	25,524	22,663	-2861	-11.2	22,819	-2705	-10.6
Kentucky	68,151	74,543	6393	9.4	73,824	5673	8.3
Louisiana	90,798	90,261	-537	-0.6	103,587	12789	14.1
Maine	18,391	16,180	-2211	-12.0	16,233	-2158	-11.7
Maryland	64,860	56,663	-8197	-12.6	52,939	-11922	-18.4
Massachusetts	89,574	76,478	-13096	-14.6	79,162	-10413	-11.6
Michigan	148,843	150,216	1373	0.9	146,333	-2511	-1.7
Minnesota	46,980	45,286	-1694	-3.6	42,666	-4314	-9.2
Mississippi	73,384	71,662	-1723	-2.4	73,342	-42	-0.1
Missouri	63,326	63,969	643	1.0	67,073	3747	5.9
Montana	11,729	9,556	-2173	-18.5	8,778	-2951	-25.2
Nebraska	18,877	16,909	-1968	-10.4	16,300	-2578	-13.7
Nevada	7,139	7,553	415	5.8	7,240	102	1.4
New Hampshire	9,205	8,084	-1121	-12.2	8,825	-379	-4.1
New Jersey	126,636	110,047	-16589	-13.1	117,656	-8980	-7.1
New Mexico	29,820	29,454	-366	-1.2	28,234	-1586	-5.3
New York	410,218	390,111	-20107	-4.9	389,005	-21212	-5.2
North Carolina	90,559	100,897	10339	11.4	98,432	7873	8.7
North Dakota	8,481	7,919	-562	-6.6	7,766	-715	-8.4
Ohio	133,318	139,108	5790	4.3	140,344	7026	5.3
Oklahoma	37,846	38,595	749	2.0	42,254	4408	11.7
Oregon	31,976	28,422	-3554	-11.1	26,138	-5838	-18.3
Pennsylvania	188,756	163,079	-25677	-13.6	157,080	-31676	-16.8
Rhode Island	14,691	13,448	-1243	-8.5	11,073	-3618	-24.6
South Carolina	59,767	64,575	4808	8.0	62,077	2310	3.9
South Dakota	11,731	11,105	-626	-5.3	10,996	-735	-6.3
Tennessee	79,848	86,068	6220	7.8	88,399	8551	10.7
Texas	248,600	265,391	16791	6.8	280,884	32284	13.0
Utah	13,809	14,362	553	4.0	15,066	1257	9.1
Vermont	8,246	6,379	-1866	-22.6	6,507	-1739	-21.1
Virginia	76,869	76,908	38	0.1	75,324	-1545	-2.0
Washington	45,166	44,054	-1112	-2.5	42,071	-3095	-6.9
West Virginia	36,233	30,834	-5400	-14.9	34,619	-1614	-4.5
Wisconsin	58,335	50,802	-7533	-12.9	45,910	-12425	-21.3
Wyoming	4,766	3,776	-990	-20.8	3,472	-1295	-27.2
Puerto Rico	140,642	140,642	0	0.0	140,642	0	0.0
United States	3,815,050	3,815,051	2	0.0	3,815,051	2	0.0

Figure 21

Changes in Chapter 1 Allocations as a Result of Replacing the per-Pupil Expenditure Factor with an Index of Average Teacher Salary



Effects of Incorporating Cost Proxies into Other Major Fund Allocation Formulas

Apart from the issue of how costs should be measured, the question needs to be addressed of why--or whether--cost variations should be taken into account in distributing some federal education funds but ignored in distributing others. Currently, aid allocations under all the Chapter 1 programs (and the Impact Aid program) are adjusted to reflect interstate variations in per-pupil spending, while allocations under the Chapter 2 Block Grant program, the Vocational Education program, and the EHA Basic Grants program, among others, reflect no comparable adjustments. It is unclear why a Chapter 1 type of per-pupil expenditure factor, or something similar, was never written into these other grant formulas; "historical accident" may have to serve as the explanation.[47] Given the foregoing negative conclusions about the validity of per-pupil expenditure as a cost proxy, eliminating this inconsistency by applying the same factor elsewhere is not a preferred alternative. If a satisfactory cost-of-education index were developed, however, there would be a s' g case for applying it to the full range of education aid programs rather than just to Chapter 1. To illustrate the directions of the likely effects, we consider here how aid distributions under one major program, EHA Basic Grants for education of the handicapped, would be redistributed if each of the two rough cost proxies discussed earlier were incorporated into its allocation formula. (The results of other such simulation exercises, not presented here, confirm that the redistributive effects of incorporating the same cost proxies into other formulas would be very similar.)

Table 57 shows how the distribution of EHA Basic Grants would be altered by multiplying the need factor in the grant formula (the number of pupils served in special

Table 57

Effects of Incorporating Alternative Cost Proxies into the Formula for Allocating EHA Basic Grants for the Handicapped, Fiscal Year 1989 (Allocations in thousands of dollars)

State	Base Case: Actual Allocation	Allocation with Cost Index Based on Average Teacher Salary		Allocation with Cost Index Based on Private-Sector Wages	
		Amount	Percentage Change From Base Case	Amount	Percentage Change From Base Case
Alabama	34,179	29,899	-12.5	30,939	-9.5
Alaska	4,077	5,433	33.3	4,764	16.9
Arizona	17,889	17,598	-1.6	16,963	-5.2
Arkansas	14,735	11,714	-20.5	12,366	-16.1
California	142,603	162,316	13.8	154,591	8.4
Colorado	16,117	16,399	1.8	15,992	-0.8
Connecticut	20,085	23,038	14.7	23,559	17.3
Delaware	3,458	3,605	4.2	3,537	2.3
District of Columbia	991	1,169	18.0	1,216	22.7
Florida	66,660	61,664	-7.5	61,401	-7.9
Georgia	30,326	28,848	-4.9	29,434	-2.9
Hawaii	3,933	4,016	2.1	3,672	-6.7
Idaho	6,423	5,433	-15.4	5,560	-13.4
Illinois	68,499	71,555	4.5	73,957	8.0
Indiana	33,504	32,956	-1.6	32,424	-3.2
Iowa	18,730	17,161	-8.4	16,257	-13.2
Kansas	13,690	12,462	-9.0	12,586	-8.1
Kentucky	24,368	21,939	-10.0	21,792	-10.6
Louisiana	21,721	17,773	-18.2	20,458	-5.8
Maine	9,026	7,921	-12.2	7,971	-11.7
Maryland	29,172	31,466	7.9	29,486	1.1
Massachusetts	44,595	47,010	5.4	48,806	9.4
Michigan	49,898	56,484	13.2	55,190	10.6
Minnesota	27,037	28,415	5.1	26,852	-0.7
Mississippi	19,467	15,647	-19.6	16,063	-17.5
Missouri	32,709	29,824	-8.8	31,366	-4.1
Montana	5,022	4,458	-11.2	4,107	-18.2
Nebraska	10,385	9,064	-12.7	8,764	-15.6
Nevada	5,157	5,102	-1.1	4,905	-4.9
New Hampshire	5,551	4,970	-10.5	5,442	-2.0
New Jersey	56,260	60,363	7.3	64,731	15.1
New Mexico	10,445	9,426	-9.8	9,062	-13.2
New York	86,437	101,490	17.4	101,507	17.4
North Carolina	37,107	34,031	-8.3	33,299	-10.3
North Dakota	4,004	3,324	-17.0	3,270	-18.3
Ohio	63,637	62,972	-1.1	63,723	0.1
Oklahoma	21,094	17,710	-16.0	19,448	-7.8
Oregon	15,178	15,204	0.2	14,025	-7.6
Pennsylvania	63,479	65,481	3.2	63,262	-0.3
Rhode Island	6,412	7,246	13.0	5,985	-6.7
South Carolina	25,056	22,536	-10.1	21,729	-13.3
South Dakota	4,643	3,618	-22.1	3,593	-22.6
Tennessee	33,579	29,793	-11.3	30,692	-8.6
Texas	103,522	97,031	-6.3	103,005	-0.5
Utah	13,754	11,775	-14.4	12,389	-9.9
Vermont	3,393	2,975	-12.3	3,044	-10.3
Virginia	38,292	37,718	-1.5	37,053	-3.2
Washington	24,364	24,441	0.3	23,412	-3.9
West Virginia	14,490	12,061	-16.8	13,582	-6.3
Wisconsin	25,519	26,204	2.7	23,752	-6.9
Wyoming	3,238	3,175	-2.0	2,927	-9.6
Puerto Rico	11,755	11,755	0.0	11,755	0.0
United States	1,445,668	1,445,668	0.0	1,445,668	0.0

education in each state) by either the cost index based on average teacher salary or the alternative index based on private-sector wages. In this instance, the comparison is not against allocations adjusted by the per-pupil expenditure index, as it was in Table 56, but rather against allocations unadjusted by any cost proxy, so the effects are not the same. The gainers from the adjustment would be, of course, states with above-average teacher salaries or private-sector wages. These are usually high-income but not necessarily high-spending states. The low-spending state of California would be one of the major beneficiaries, along with the high-spending states of Connecticut, Michigan, and New York. Most southern states, along with such low-income nonsouthern states as Idaho, Nebraska, North and South Dakota, Montana, Maine, and Vermont, would receive reduced levels of funding. Note that some states that now receive substantial extra funds because of the per-pupil expenditure factor in Chapter 1 would not benefit from the cost adjustments shown in Table 57. Kansas, Montana, Vermont, and Wyoming, for example, all have average or above-average spending but lose rather than gain from the adjustments because of their below-average teacher salaries and private wages. California, in contrast, is unambiguously a high-cost state, and so it gains from the adjustments instead of being penalized (for low fiscal effort) as it is under the current Chapter 1 formula. Despite the defects of both cost factors reflected in Table 57, the resulting hypothetical allocations probably approximate a uniform distribution of "real" dollars per handicapped child more closely than does the actual distribution of EHA Basic Grant funds.

Prospects for Developing a Valid Cost Adjustment Factor

If per-pupil expenditure is not a valid cost proxy and if indices based on average teacher salary and private-sector wage indices have major flaws, what are the prospects of developing a "good" cost index for use in federal education aid formulas? The answer

depends largely on how rigorously "good" is defined. It can be argued that a new index, to be suitable for adoption, must be impervious to theoretical or technical criticism, but this stance is useful mainly for defending the status quo. A more pragmatic position is that an alternative cost index, to be recommendable, must be (1) demonstrably closer to a "true," or ideal, index than the present per-pupil expenditure factor and (2) not systematically biased in favor of or against particular categories of states. This more relaxed standard seems attainable, even if the purer standard does not.

One approach to meeting the pragmatic standard is to develop an improved index of teacher salary. Although average teacher salary is not a satisfactory cost indicator (mainly because the "average teacher" does not have the same attributes in each state), several steps could be taken to construct a more satisfactory index from teacher salary data. One would be to eliminate the distorting effects of differences in average teacher experience and training among states by taking the salaries of *standard* teachers (teachers with, say, a Master's degree and 10 years of experience) rather than average teachers as the benchmark. A more elaborate but sounder approach would be to take the salaries associated with *multiple* combinations of teacher characteristics, appropriately weighted, into account in constructing an index (teachers with a bachelor's degree and 5, 10, and 15 years of experience; those with a master's degree and 5, 10, 15 years of experience, etc.). Detailed indices of this type, based on data drawn from teacher salary *schedules* (as well as detailed price data on the nonpersonnel components of education costs) have been developed and used for a number of years in Canada, but not in the United States. Similar indices for our states, based on this already available methodology, would make considerably better cost proxies than the cruder salary measures now available.

Additional steps could be taken to refine the salary indices, but most would require new data collection or adjustments based on statistical models of salary determination. For instance, it might be possible to adjust statistically for such things as the types of training institutions teachers attended, levels of teachers' academic performance (as indicated by test scores), the strength of teachers' unions in each state, interstate differences in costs of living, and perhaps variations in pay in occupations comparable with teaching. The resulting statistically based indices, even if not acceptable for direct use in grant formulas, might prove very useful for assessing, validating, and choosing among the simpler cost proxies.

Summary

The present treatment of cost-of-education differentials in the federal education aid formulas is questionable in two major respects: First, factors intended to represent education costs are included in some formulas but not in others, even though such adjustments would be just as appropriate for the latter as for the former; and second, the principal so-called cost factor now in use, a bounded index of education spending per pupil, is not a valid proxy for the cost of education. The consequence of including the per-pupil expenditure factor in all the Chapter 1 formulas is that some states receive significantly more aid and some significantly less aid than would be coming to them under a formula properly adjusted for costs. Moreover, the errors are systematic rather than random. The per-pupil expenditure measure generally exaggerates the cost of education in high spending states and underestimates it in low-spending states. The net effect is to shift funds toward the former and away from the latter, making the aid distribution significantly less equitable. Immediately available alternative indicators such as indices of teachers' salaries and private-sector wages have important shortcomings of their own but probably approximate interstate differences in costs

more closely than does the present Chapter 1 factor. It is not necessary to rely on these crude proxies, however, because improved indices could be constructed from available or feasible-to-collect data. Such indices, though still imperfect, would be superior to the per-pupil expenditure proxy and hence candidates for use not only in the Chapter 1 formulas but also in other formulas that now contain no cost adjustments at all.

CHANGES IN FORMULA CONSTRAINTS

As explained in Chapter 2, two principal kinds of constraints are attached to the existing elementary-secondary grant formulas: those imposing lower bounds on state percentage shares or dollar amounts of aid and those "holding harmless" state allocations at levels based on allocations in earlier years. Each type of constraint alters the interstate distributions of federal aid, essentially by exempting certain states from the full effects of the basic fund allocation methods. Each creates exceptions to the general principle that each state, other things being equal, receives aid in proportion to the designated indicator(s) of need. Apart from the argument that certain hold-harmless provisions (those guaranteeing less than 100 percent of prior-year funding to each state) perform the useful function of smoothing the flow of federal aid over time, little justification has been offered for these exceptions. We consider here, therefore, what the allocative effects of the constraints have been and how the distributions would be altered if they were deleted from the formulas.

The Effects of Lower Bounds on State Shares or Amounts of Aid

Allocations under six of the formulas covered by this report are constrained by lower-bound provisions.[48] Four programs, Chapter 2 Block Grants, Vocational Education, Mathematics and Science, and Drug-Free Schools, require that each state receive at least 1/2

of 1 percent of the available funds.[49] The Adult Education formula contains the built-in constraint that each state must receive a fixed grant of $250,000 before the remaining funds are distributed in proportion to the specified indicator of need. The Chapter 1 Concentration Grant formula contains a complex lower-bound provision according to which, in FY 1989, each state was guaranteed either 1/4 of 1 percent of the available funds or no less than $340,000. All six provisions generate more aid for states with small populations than such states would otherwise have received under the corresponding regular grant formulas.

Table 58 shows how the distributions of funds are affected by these lower bounds. The table covers each of the aforesaid six programs individually and shows, in its final section, the effects of all six lower-bound provisions combined. Allocations under the first four programs represented in the table are all subject to the 1/2 of 1 percent minimum allocation rule, and the effects are similar in all four instances: the allotments of the least-populous states rise sharply because of the aid floors, in some cases more than doubling; aid allocations to most other states fall by amounts ranging from 2 to 3 percent. Under the Chapter 2 Block Grant program, for example (and under the Drug-Free Schools program, which, in FY 1989, had exactly the same formula), Alaska, Delaware, the District of Columbia, Vermont, and Wyoming each receive from 200 to 250 percent as much federal aid because of the 1/2 of 1 percent rule as they would have received otherwise. Hawaii, Montana, Nevada, New Hampshire, North Dakota, Rhode Island, and South Dakota enjoy increases ranging from 17 to 75 percent, and Idaho and Maine receive small increments. All other states lose 2.5 percent of what they would have otherwise received. The results under the Mathematics and Science program and the Vocational Education program are similar, except for relatively minor differences attributable to the hold-harmless provisions and the different

Table 58

Effects of Lower Bounds on State Percentage Shares
or State Allotments of Aid, by Program, Fiscal Year 1989
(Allocations in thousands of dollars)

State	Chapter 2 Block Grants				Mathematics and Science			
	Allocation without Lower Bounds	Actual Allocation (with Lower Bounds)	Difference	Percentage Change	Allocation without Lower Bounds	Actual Allocation (with Lower Bounds)	Difference	Percentage Change
Alabama	8,175	7,969	-206.0	-2.5	2,330	2,260	-69.8	-3.0
Alaska	1,114	2,296	1182.0	106.1	370	635	265.7	71.9
Arizona	6,285	6,127	-158.4	-2.5	1,545	1,502	-42.9	-2.8
Arkansas	4,724	4,605	-119.0	-2.5	1,428	1,384	-43.9	-3.1
California	49,726	48,473	-1253.0	-2.5	13,858	13,448	-410.6	-3.0
Colorado	6,017	5,865	-151.6	-2.5	1,450	1,411	-39.8	-2.7
Connecticut	5,400	5,264	-136.1	-2.5	1,457	1,414	-42.5	-2.9
Delaware	1,144	2,296	1152.2	100.7	374	635	261.6	70.0
District of Columbia	895	2,296	1400.8	156.5	428	635	207.0	48.3
Florida	18,816	18,342	-474.1	-2.5	5,476	5,310	-165.5	-3.0
Georgia	12,521	12,205	-315.5	-2.5	3,333	3,236	-96.5	-2.9
Hawaii	1,959	2,296	336.7	17.2	456	635	179.5	39.4
Idaho	2,208	2,296	88.0	4.0	524	635	111.0	21.2
Illinois	21,621	21,076	-544.8	-2.5	6,020	5,841	-178.2	-3.0
Indiana	10,741	10,470	-270.6	-2.5	2,453	2,502	49.3	2.0
Iowa	5,331	5,196	-134.3	-2.5	1,230	1,264	33.9	2.8
Kansas	4,555	4,440	-114.8	-2.5	1,106	1,076	-30.5	-2.8
Kentucky	7,340	7,155	-184.9	-2.5	2,096	2,033	-62.8	-3.0
Louisiana	9,249	9,016	-233.1	-2.5	2,788	2,702	-85.5	-3.1
Maine	2,188	2,296	107.9	4.9	632	635	3.0	0.5
Maryland	7,877	7,678	-198.5	-2.5	2,119	2,057	-61.7	-2.9
Massachusetts	9,418	9,181	-237.3	-2.5	2,902	2,813	-89.9	-3.1
Michigan	17,852	17,402	-449.8	-2.5	4,977	4,830	-147.5	-3.0
Minnesota	7,837	7,639	-197.5	-2.5	1,812	1,804	-8.0	-0.4
Mississippi	5,768	5,623	-145.3	-2.5	1,915	1,854	-61.1	-3.2
Missouri	9,348	9,113	-235.6	-2.5	2,259	2,197	-62.1	-2.8
Montana	1,591	2,296	704.6	44.3	416	635	219.0	52.6
Nebraska	3,003	2,928	-75.7	-2.5	713	694	-19.4	-2.7
Nevada	1,750	2,296	545.5	31.2	374	635	261.7	70.0
New Hampshire	1,890	2,296	406.3	21.5	412	635	223.6	54.3
New Jersey	13,108	12,777	-330.3	-2.5	3,826	3,710	-115.8	-3.0
New Mexico	3,103	3,025	-78.2	-2.5	879	853	-26.2	-3.0
New York	30,959	30,179	-780.1	-2.5	10,828	10,476	-351.6	-3.3
North Carolina	11,825	11,527	-298.0	-2.5	3,075	2,987	-88.0	-2.9
North Dakota	1,313	2,296	983.1	74.9	325	635	310.5	95.6
Ohio	20,517	20,000	-517.0	-2.5	5,008	4,870	-138.4	-2.8
Oklahoma	6,315	6,156	-159.1	-2.5	1,505	1,464	-41.0	-2.7
Oregon	4,933	4,809	-124.3	-2.5	1,336	1,297	-39.0	-2.9
Pennsylvania	20,567	20,048	-518.2	-2.5	6,015	5,833	-182.2	-3.0
Rhode Island	1,631	2,296	664.9	40.8	458	635	177.1	38.7
South Carolina	6,812	6,641	-171.7	-2.5	1,866	1,811	-54.8	-2.9
South Dakota	1,372	2,296	923.4	67.3	360	635	275.1	76.4
Tennessee	9,179	8,948	-231.3	-2.5	2,513	2,439	-73.8	-2.9
Texas	34,629	33,756	-872.6	-2.5	9,404	9,129	-275.1	-2.9
Utah	4,426	4,314	-111.5	-2.5	834	962	127.9	15.3
Vermont	1,004	2,296	1291.4	128.6	308	635	327.5	106.4
Virginia	10,323	10,063	-260.1	-2.5	2,606	2,533	-73.4	-2.8
Washington	8,225	8,017	-207.2	-2.5	2,041	1,984	-56.9	-2.8
West Virginia	3,710	3,616	-93.5	-2.5	1,065	1,033	-32.0	-3.0
Wisconsin	9,080	8,851	-228.8	-2.5	2,172	2,112	-59.3	-2.7
Wyoming	1,044	2,296	1251.6	119.9	240	635	395.5	164.9
Puerto Rico	8,755	8,535	-220.6	-2.5	3,149	3,046	-103.2	-3.3
United States	459,171	459,171	0.0	0.0	127,067	127,067	0.0	0.0

Table 58 (contd)

Effects of Lower Bounds on State Percentage Shares
or State Allotments of Aid, by Program, Fiscal Year 1989
(Allocations in thousands of dollars)

State	Drug-Free Schools				Vocational Education			
	Allocation without Lower Bounds	Actual Allocation (with Lower Bounds)	Difference	Percentage Change	Allocation without Lower Bounds	Actual Allocation (with Lower Bounds)	Difference	Percentage Change
Alabama	5,061	4,933	-127.5	-2.5	16,699	16,375	-324.5	-1.9
Alaska	690	1,421	731.7	106.1	1,566	4,121	2554.9	163.1
Arizona	3,891	3,793	-98.0	-2.5	11,560	11,335	-224.6	-1.9
Arkansas	2,924	2,851	-73.7	-2.5	9,467	9,283	-183.9	-1.9
California	30,783	30,008	-775.7	-2.5	73,726	72,293	-1432.5	-1.9
Colorado	3,725	3,631	-93.9	-2.5	10,326	10,125	-200.6	-1.9
Connecticut	3,343	3,259	-84.2	-2.5	8,376	8,224	-152.2	-1.8
Delaware	708	1,421	713.3	100.7	2,682	4,121	1439.1	53.7
District of Columbia	554	1,421	867.2	156.5	2,514	4,121	1606.9	63.9
Florida	11,648	11,355	-293.5	-2.5	35,424	34,735	-688.3	-1.9
Georgia	7,751	7,556	-195.3	-2.5	23,472	23,016	-456.1	-1.9
Hawaii	1,213	1,421	208.4	17.2	3,919	4,121	201.9	5.2
Idaho	1,367	1,421	54.5	4.0	3,929	4,121	192.4	4.9
Illinois	13,385	13,047	-337.3	-2.5	35,414	34,726	-688.1	-1.9
Indiana	6,649	6,482	-167.5	-2.5	20,569	20,169	-399.7	-1.9
Iowa	3,300	3,217	-83.2	-2.5	9,846	9,671	-174.9	-1.8
Kansas	2,820	2,749	-71.1	-2.5	7,822	7,670	-152.0	-1.9
Kentucky	4,544	4,429	-114.5	-2.5	15,233	14,937	-296.0	-1.9
Louisiana	5,726	5,581	-144.3	-2.5	18,114	17,762	-352.0	-1.9
Maine	1,354	1,421	66.8	4.9	4,465	4,378	-86.7	-1.9
Maryland	4,876	4,753	-122.9	-2.5	13,039	13,039	0.0	0.0
Massachusetts	5,830	5,683	-146.9	-2.5	17,324	17,324	0.0	0.0
Michigan	11,051	10,773	-278.5	-2.5	31,478	31,283	-194.8	-0.6
Minnesota	4,851	4,729	-122.2	-2.5	13,438	13,438	0.0	0.0
Mississippi	3,571	3,481	-90.0	-2.5	11,114	10,898	-215.9	-1.9
Missouri	5,787	5,641	-145.8	-2.5	17,125	16,877	-248.0	-1.4
Montana	985	1,421	436.2	44.3	3,927	4,121	194.5	5.0
Nebraska	1,859	1,812	-46.9	-2.5	5,410	5,305	-105.1	-1.9
Nevada	1,084	1,421	337.7	31.2	3,313	4,121	808.3	24.4
New Hampshire	1,170	1,421	251.5	21.5	3,913	4,121	207.7	5.3
New Jersey	8,114	7,910	-204.5	-2.5	20,067	19,677	-389.9	-1.9
New Mexico	1,921	1,872	-48.4	-2.5	6,030	5,913	-117.2	-1.9
New York	19,166	18,683	-482.9	-2.5	51,362	51,362	0.0	0.0
North Carolina	7,320	7,136	-184.5	-2.5	25,290	24,799	-491.4	-1.9
North Dakota	813	1,421	608.6	74.9	3,227	4,121	894.4	27.7
Ohio	12,701	12,381	-320.0	-2.5	37,571	36,841	-730.0	-1.9
Oklahoma	3,909	3,811	-98.5	-2.5	12,284	12,045	-238.7	-1.9
Oregon	3,054	2,977	-76.9	-2.5	9,168	8,990	-178.1	-1.9
Pennsylvania	12,732	12,411	-320.8	-2.5	39,140	38,550	-589.8	-1.5
Rhode Island	1,010	1,421	411.6	40.8	3,911	4,121	210.4	5.4
South Carolina	4,217	4,111	-106.3	-2.5	14,359	14,080	-279.0	-1.9
South Dakota	850	1,421	571.7	67.3	3,508	4,121	613.3	17.5
Tennessee	5,683	5,539	-143.2	-2.5	19,098	18,726	-371.1	-1.9
Texas	21,437	20,897	-540.2	-2.5	60,031	58,865	-1166.5	-1.9
Utah	2,740	2,671	-69.0	-2.5	6,767	6,635	-131.5	-1.9
Vermont	622	1,421	799.5	128.6	2,779	4,121	1342.0	48.3
Virginia	6,391	6,230	-161.0	-2.5	18,971	18,603	-368.6	-1.9
Washington	5,092	4,963	-128.3	-2.5	14,267	13,990	-277.2	-1.9
West Virginia	2,296	2,239	-57.9	-2.5	7,629	7,480	-148.2	-1.9
Wisconsin	5,621	5,479	-141.6	-2.5	16,540	16,349	-191.2	-1.2
Wyoming	646	1,421	774.8	119.9	1,848	4,121	2273.1	123.0
Puerto Rico	5,420	5,283	-136.6	-2.5	15,144	14,850	-294.3	-1.9
United States	284,255	284,255	0.0	0.0	824,193	824,193	0.0	0.0

Table 58 (contd)

Effects of Lower Bounds on State Percentage Shares
or State Allotments of Aid, by Program, Fiscal Year 1989
(Allocations in thousands of dollars)

State	Adult Education				Chapter 1 Concentration Grants				Total: 6 Programs Combined			
	Allocation without Lower Bounds	Actual Allocation (with Lower Bounds)	Difference	Percentage Change	Allocation without Lower Bounds	Actual Allocation (with Lower Bounds)	Difference	Percentage Change	Allocation without Lower Bounds	Actual Allocation (with Lower Bounds)	Difference	Percentage Change
Alabama	2,795	2,777	-17.6	-0.6	4,954	4,905	-49.3	-1.0	40,014	39,219	-794.7	-2.0
Alaska	142	378	236.4	166.7	177	340	162.7	91.7	4,058	9,192	5133.4	126.5
Arizona	1,368	1,487	119.0	8.7	2,379	2,355	-23.7	-1.0	27,028	26,599	-428.6	-1.6
Arkansas	1,695	1,782	87.8	5.2	2,622	2,596	-26.1	-1.0	22,860	22,501	-358.9	-1.6
California	11,889	11,001	-888.3	-7.5	21,053	20,843	-209.7	-1.0	201,035	196,065	-4969.7	-2.5
Colorado	1,209	1,343	134.2	11.1	1,139	1,128	-11.3	-1.0	23,866	23,503	-363.0	-1.5
Connecticut	1,684	1,773	88.8	5.3	1,373	1,359	-13.7	-1.0	21,633	21,293	-339.9	-1.6
Delaware	329	547	218.5	66.4	450	446	-4.5	-1.0	5,686	9,466	3780.1	66.5
District of Columbia	392	605	212.4	54.1	1,067	1,056	-10.6	-1.0	5,851	10,135	4283.7	73.2
Florida	5,951	5,631	-319.8	-5.4	8,630	8,544	-86.0	-1.0	85,945	83,918	-2027.1	-2.4
Georgia	3,919	3,794	-125.2	-3.2	5,684	5,627	-56.6	-1.0	56,680	55,435	-1245.3	-2.2
Hawaii	442	650	207.7	47.0	359	432	72.9	20.3	8,348	9,556	1207.1	14.5
Idaho	440	648	207.8	47.2	362	432	70.5	19.5	8,830	9,554	724.2	8.2
Illinois	6,681	6,291	-389.6	-5.8	8,045	7,965	-80.1	-1.0	91,164	88,946	-2218.2	-2.4
Indiana	3,190	3,135	-55.4	-1.7	986	976	-9.8	-1.0	44,588	43,734	-853.8	-1.9
Iowa	1,481	1,589	108.3	7.3	551	545	-5.5	-1.0	21,738	21,482	-255.7	-1.2
Kansas	1,149	1,289	140.0	12.2	530	525	-5.3	-1.0	17,982	17,748	-233.6	-1.3
Kentucky	2,806	2,787	-18.6	-0.7	3,744	3,707	-37.3	-1.0	35,762	35,048	-714.1	-2.0
Louisiana	2,863	2,839	-24.1	-0.8	4,996	4,947	-49.8	-1.0	43,736	42,847	-888.7	-2.0
Maine	624	815	190.2	30.5	576	570	-5.7	-1.0	9,840	10,115	275.5	2.8
Maryland	2,443	2,459	16.1	0.7	2,320	2,297	-23.1	-1.0	32,674	32,284	-390.0	-1.2
Massachusetts	2,906	2,877	-28.2	-1.0	3,681	3,644	-36.7	-1.0	42,061	41,522	-539.0	-1.3
Michigan	5,155	4,911	-243.5	-4.7	5,808	5,750	-57.8	-1.0	76,321	74,949	-1372.0	-1.8
Minnesota	1,964	2,026	62.0	3.2	1,260	1,248	-12.6	-1.0	31,162	30,884	-278.3	-0.9
Mississippi	1,827	1,902	75.0	4.1	4,350	4,307	-43.3	-1.0	28,546	28,065	-480.6	-1.7
Missouri	3,103	3,056	-47.1	-1.5	2,640	2,614	-26.3	-1.0	40,264	39,499	-764.9	-1.9
Montana	370	584	214.6	58.1	304	390	86.8	28.6	7,592	9,448	1855.7	24.4
Nebraska	745	924	178.6	24.0	524	519	-5.2	-1.0	12,256	12,182	-73.6	-0.6
Nevada	378	592	213.8	56.6	119	340	221.4	186.6	7,017	9,405	2388.4	34.0
New Hampshire	461	667	205.9	44.7	34	340	306.4	912.0	7,879	9,480	1601.4	20.3
New Jersey	4,278	4,119	-159.6	-3.7	5,532	5,477	-55.1	-1.0	54,925	53,670	-1255.1	-2.3
New Mexico	704	886	182.6	25.9	1,844	1,825	-18.4	-1.0	14,480	14,374	-105.7	-0.7
New York	10,473	9,720	-752.7	-7.2	20,284	20,082	-202.0	-1.0	143,071	140,502	-2569.4	-1.8
North Carolina	4,390	4,220	-170.3	-3.9	3,901	3,862	-38.9	-1.0	55,802	54,531	-1271.0	-2.3
North Dakota	359	575	215.6	60.1	256	402	146.0	57.0	6,292	9,450	3158.2	50.2
Ohio	6,215	5,870	-345.0	-5.6	4,131	4,090	-41.1	-1.0	86,143	84,052	-2091.6	-2.4
Oklahoma	1,794	1,872	78.2	4.4	1,549	1,534	-15.4	-1.0	27,357	26,883	-474.5	-1.7
Oregon	1,271	1,354	133.1	10.9	379	432	53.5	14.1	20,090	19,858	-231.8	-1.2
Pennsylvania	7,226	6,785	-441.9	-6.1	5,881	5,822	-58.6	-1.0	91,561	89,450	-2111.5	-2.3
Rhode Island	632	821	189.5	30.0	643	637	-6.4	-1.0	8,285	9,932	1647.0	19.9
South Carolina	2,324	2,351	27.5	1.2	3,083	3,052	-30.7	-1.0	32,662	32,047	-614.9	-1.9
South Dakota	376	590	214.0	56.9	522	517	-5.2	-1.0	6,988	9,580	2592.3	37.1
Tennessee	3,365	3,292	-72.1	-2.1	4,596	4,550	-45.8	-1.0	44,433	43,496	-937.3	-2.1
Texas	9,054	8,437	-616.9	-6.8	12,853	12,725	-128.0	-1.0	147,409	143,810	-3599.2	-2.4
Utah	523	723	199.9	38.2	279	432	152.9	54.8	15,568	15,737	168.7	1.1
Vermont	259	484	225.2	87.0	241	340	99.4	41.3	5,213	9,298	4085.0	78.4
Virginia	3,477	3,394	-82.9	-2.4	3,220	3,188	-32.1	-1.0	44,988	44,010	-978.2	-2.2
Washington	1,803	1,880	77.4	4.3	1,130	1,119	-11.3	-1.0	32,558	31,954	-603.6	-1.9
West Virginia	1,418	1,532	114.2	8.1	1,737	1,720	-17.3	-1.0	17,855	17,620	-234.6	-1.3
Wisconsin	2,503	2,514	10.3	0.4	1,389	1,375	-13.8	-1.0	37,305	36,681	-624.5	-1.7
Wyoming	194	425	231.4	119.3	16	340	324.4	2074.9	3,988	9,239	5250.7	131.7
Puerto Rico	2,792	2,775	-17.4	-0.6	8,715	8,628	-86.8	-1.0	43,976	43,117	-858.8	-2.0
United States	135,781	135,781	0.0	0.0	172,900	172,900	0.0	0.0	2,003,367	2,003,367	0.0	0.0

need indicators used in those programs. The lists of gainers are virtually the same in all four cases.

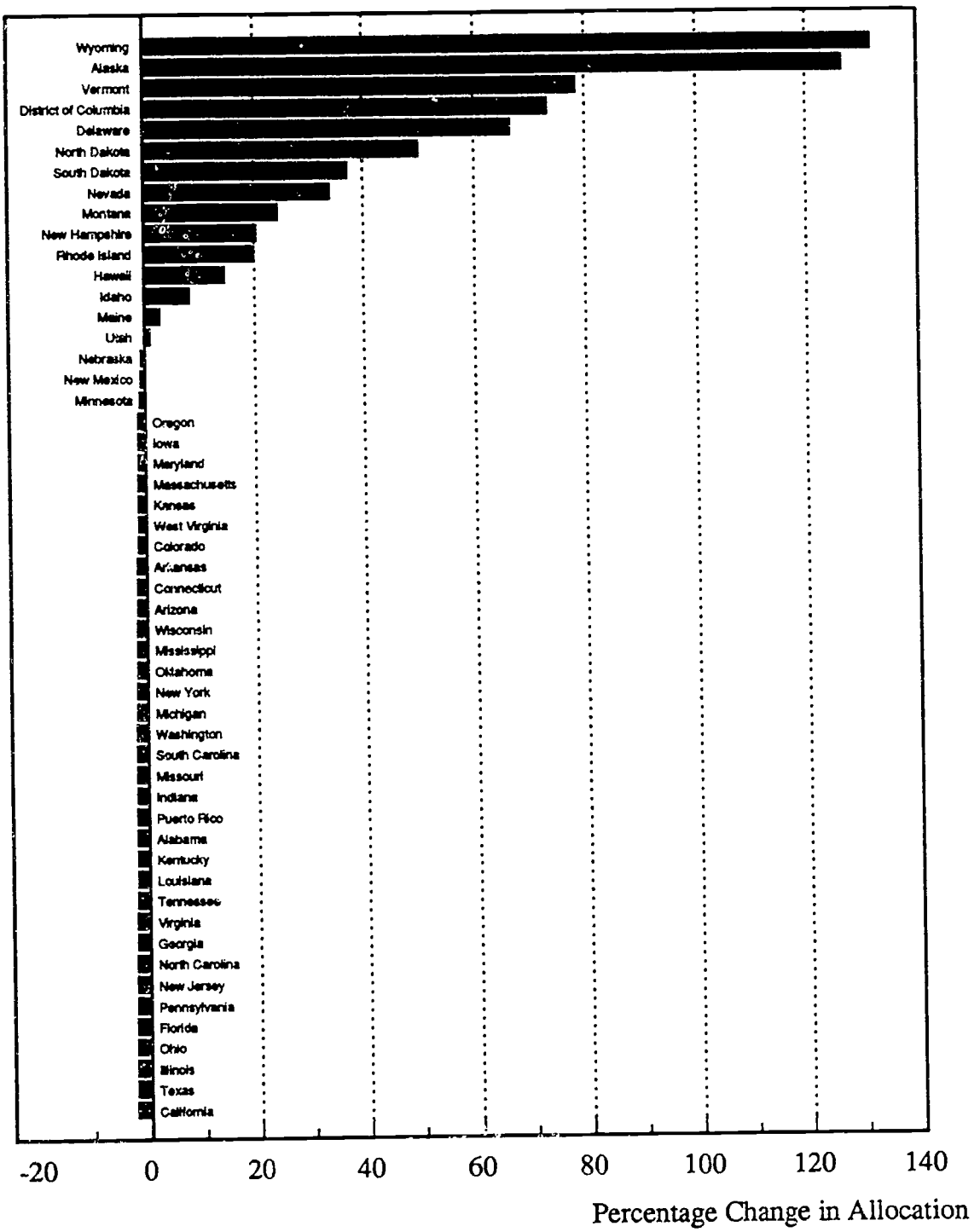
The different mathematical form of the Adult Education formula causes the gains from its $250,000 fixed-grant component to be somewhat more widely diffused. The same states as just listed are the main beneficiaries (in percentage terms) under this program as well, but they are joined by Utah, Nebraska, and New Mexico.

The effects of the Concentration Grant program's complex lower-bound provision are even more narrowly focused than those of the lower-bound rules in the other programs. Only 11 states gain from this provision, 2 of which, New Hampshire and Wyoming, receive 9 times as much and 21 times as much, respectively, as the trivial amounts that would have been coming to them in the absence of the aid floors. All other states lose 1 percent of their funding because of the constraints.

The combined effects of the lower-bound provisions of all six programs are shown in the last part of Table 58 and also in Figure 22. In the aggregate, these provisions yield major gains (30 percent or more) for Alaska, Delaware, the District of Columbia, Nevada, North Dakota, South Dakota, Vermont, and Wyoming; more moderate gains (8 to 24 percent) for Hawaii, Idaho, Montana, New Hampshire, and Rhode Island; and marginal gains for Maine and Utah. To finance these benefits, all other states give up amounts ranging from 0.6 percent to 2.5 percent of what they would have received in the absence of the constraints. All together, the six sets of lower-bound provisions shift a total of $33.8 million to the least-populous states. This sum amounts to only 1.7 percent of all funds distributed under the six programs, but it represents a gain of 39 percent in federal aid to the dozen or so states that benefit most from these provisions.

Figure 22

Combined Changes in Allocations as a Result of Including Lower-Bound Provisions in Six Federal Aid Formulas



The Effects of Hold-Harmless Provisions

Hold-harmless constraints are imposed to protect aid recipients, either temporarily or permanently, against fund reductions that might be caused by changes in formula factors. The two main hold-harmless provisions in the current elementary-secondary education programs are those attached to the Vocational Education and Chapter 1 Basic Grants formulas. The effects of these provisions turn out to be so minor (in FY 1989) that they are of little consequence for the analysis of federal fund distribution methods. These effects can be summarized as follows:

The hold-harmless provision in the Vocational Education formula stipulates that no state may receive less aid than it received in FY 1985. In FY 1989 this rule protected five states. Massachusetts would have received 11.9 percent less aid without it; New York would have received 5.3 percent less; and three other states, Maryland, Michigan, and Minnesota, would have lost smaller amounts. Most other states would have received slightly less than 1 percent more aid if the provision had not been in effect.

Under the Chapter 1 Basic Grant formula no county may receive less than 85 percent of the aid it received in the prior year. However, two features of the Chapter 1 program render this provision virtually irrelevant: (1) the main need indicator, the number of poor children in a county in 1979, remains fixed from year to year; and (2) the total pool of Chapter 1 money has been increasing. The state most affected by the hold-harmless rule, Wyoming, received 0.2 percent more aid because of it; no other state allocation changed by even 0.1 percent.

Two kinds of developments could make hold-harmless provisions more relevant in the future. One is that levels of program funding could stabilize or decline. Even a stable level

of funding would soon bring the hold-harmless provisions into play, as changes in values of the formula factors would cause some states' calculated allotments to decline. The other is that major, or even moderate, changes in formulas could trigger the hold-harmless provisions, assuming that they were retained when other formula features were modified. It has to be noted, however, that retaining hold-harmless provisions--or at least provisions of the permanent, 100 percent type--could preclude significant distributional reforms.

It does seem quite reasonable, however, to consider the possibility of adding *new* hold-harmless provisions--but of the type that are temporary and that guarantee less than 100 percent of prior funding--to formulas undergoing substantial alteration. Such provisions would stipulate, for example, that no state could receive, under a new or modified formula, less than, say, 90 percent of what it received in the previous year. As a consequence, large aid reductions would not be made abruptly but would be phased in over several years. These "fractional" hold-harmless provisions would serve as transitional devices rather than permanent impediments to redistributions of aid. As such, they might diminish the political opposition to changes, easing the task of distributional reform.

COMBINATIONS OF ALTERNATIVES

Although this chapter examines a variety of alternatives to the present fund allocation formulas, it does not come close to covering the full range of possibilities; in particular, limitations of space and time have precluded consideration of more than a few of the innumerable *combinations* that might be formed of changes in individual formula features. Such combinations can be expected to figure prominently in any serious effort to redesign the formulas, because they are the means by which compromises may be forged between conflicting visions of distributional reform.

The following are examples of the types of combined changes that might be proposed, or that might be appropriate to consider, in debates over formula design:

- In the case of Chapter 1 Grants to LEAs, there might be reason to consider simultaneous changes in the way in which poverty is measured and in the role assigned to poverty concentration in distributing funds. For example, a shift from Census poverty counts to counts of children eligible for free school lunches, which would tend to benefit western and Sunbelt states, could be partly offset, or "balanced" by raising the percentage threshold for Concentration Grants, which would tend to benefit urban states in the Northeast. Other potentially relevant combinations include simultaneous changes in the formula's cost adjustment factor and either (or both) the poverty indicator and the Concentration Grant share of total program funds.

- In attempting to improve the adjustment for fiscal capacity in the Vocational Education formula, it would be important to consider various combinations of changes in the method of measuring state fiscal capacity and the method of incorporating the fiscal capacity indicator into the allocation formula. For example, a shift from a per capita to a per-pupil measure of capacity might be accompanied by an offsetting or reinforcing change in the steepness of the aid-versus-fiscal capacity relationship. (There would also be reason to consider multiple combinations of the same features in developing a fiscal capacity adjustment for a formula that does not now have one.)

- The possibility of combining rewards for state fiscal effort with adjustments for differences in fiscal capacity has already been discussed (in the context of variable matching formulas), but the possibility of combining either or both of those changes with adjustments for interstate cost differentials also merits consideration. In particular, it can be argued that an adjustment for fiscal capacity alone would be unfair to the higher-income states if cost differentials were not taken into account and, therefore, that combinations of capacity and cost adjustments need to be considered.

It is evident that there are far too many combined alternatives to examine comprehensively, especially considering that (1) some combinations are applicable to multiple fund allocation formulas, or even to all formulas, rather than to just a single program, and (2) many pertinent formula changes are matters of degree. A thorough investigation of just the combined effects of changes in poverty indicators and changes in Concentration Grant

thresholds, for example, could easily involve as many separate formula simulations as are presented in this entire chapter. As a practical matter, the effects of combined changes will have to be determined in more specialized studies, focused on individual programs or particular formula design issues. This report provides guideposts for such studies but does not substitute for detailed issue-specific and program-specific analyses.

Notes

1. The first set of state-level indicators from the National Assessment of Educational Progress (NAEP), covering eighth grade mathematics achievement in 37 states, has just been released. If and when such indicators are produced in more subjects and for all states, the feasibility and desirability of using the results in aid formulas will merit a careful assessment.

2. When the 1990 Census data become available, it will be important to revisit not only the question of the poverty threshold but also such related issues as whether indicators of the severity of poverty (e.g., poverty "gaps") should be included in federal funding formulas instead of or in addition to the present indicator of poverty incidence.

3. This scaling procedure pertains only to the main component of the present count of Chapter 1 eligibles, which is the 1980 Census count of children in each county from families with incomes below the poverty line. It does not apply to the other (much smaller) components of the count of eligibles (certain AFDC [Aid to Families with Dependent Children] recipients, etc.), which are already updated routinely.

4. Note that adoption of the type of alternative discussed here--or any alternative that involves changing Chapter 1 allocations on the basis of state-level data--presupposes a separation between the interstate and intercounty allocation processes that does not exist under the present Chapter 1 fund allocation method. In this respect, the Chapter 1 allocation process would become more like the processes applicable to other major federal education aid programs, in which federal funds are first distributed among the states and then, in a separate procedure, allocated among eligible local recipients within each state.

5. That the mid-1980s poverty estimates for small states are relatively unreliable has been confirmed with a staff member of CDF (personal communication).

6. Specifically, the effects of this alternative are computed by replacing each county's actual count of Chapter 1 eligibles with an estimated count obtained by (1) multiplying the official Census poverty count for the county by the ratio of (a) the CDF/CPS mid-1980s estimate of the child poverty rate in the state in which the county is located to (b) that state's poverty rate corresponding to the official Census poverty count and (2) adding to the result the other (minor) categories of Chapter 1 eligibles. Note that because CDF poverty estimates are not available for Puerto Rico, the aid allocation to Puerto Rico was held constant in this exercise.

7. Children are eligible for free school lunches if their family income falls below 130 percent of the official poverty line and for reduced-price lunches if family income falls between 130 and 185 percent of the poverty line. This compares, of course, with a criterion of 100 percent of the poverty line (in 1979) to be counted as an official Chapter 1 eligible.

8. The results shown in Table 25 are only approximate because the formula simulation has been carried out with a state-level analog of the Chapter 1 formula rather than with the actual county-level formula. The base-case allocations shown in the table also were produced with the state-level formula and consequently do not exactly match the Chapter 1 allocations presented earlier. However, the errors are small and have negligible effects on the results.

9. The Food and Nutrition Service of the Department of Agriculture, the agency that administers the federal school lunch program, has only recently begun to produce tabulations of the number of children certified as eligible for free or reduced-price lunches by state. NCES has published such data for earlier years, but NCES analysts acknowledge that the reports on which these published figures were based contained major gaps and other inaccuracies.

10. Note that these figures reflect the assumption that only the percentage criterion of eligibility for Concentration Grants is in effect. If an absolute criterion were in effect as well, aid would be more widely diffused and the degree of concentration would be less than suggested in Table 27.

11. These three alternatives were selected for illustrative purposes out of a much larger array of Concentration Grant threshold combinations examined in the study. The questions of how other combinations would alter the distributions and affect particular states are of interest, but exploring them in detail would require a specialized paper on the Concentration Grant formula.

12. These results reflect the presence of the lower-bound provision (1/2 of 1 percent floor) in the Mathematics and Science grant formula. In the absence of that provision, some of the states protected by the lower bound would also be adversely affected by including either the Chapter 1 allocation or the Chapter 1 poverty count as a formula factor.

13. Note that states are already required under Chapter 2 to distribute funds among local school districts in a way that takes into account the number of "costly to educate" children--meaning mainly handicapped and disadvantaged children--in each LEA. It can reasonably be argued that if this principle is appropriate at the substate level, it deserves consideration at the interstate level as well.

14. The major study is Moore et al. (1988), but the explicit estimates of excess costs by handicapping condition appear in a supplemental paper by Strang (1989).

15. The OSERS reports present data on numbers of handicapped children of all ages (0-21), but only the counts of children ages 6-21 are broken down by handicapping condition. For this formula simulation exercise, therefore, it has been necessary to assume (undoubtedly with some error) that the breakdowns by handicapping condition for children in the 6-21 age range apply to handicapped children in all the age groups taken into account in the fund allocation formulas.

16. The weighting factors are substantially higher under the Chapter 1 Handicapped program than under the EHA program because the former program, which covers children served in state-operated programs for the handicapped, usually (but not always) serves children with more severe handicapping conditions.

17. Note, however, that there is an important offsetting consideration: states or LEAs might have to incur higher costs of their own to provide the services normally called for in the individualized education programs (IEPs) written for children identified as having more severe

handicapping conditions. Thus a pupil classified as retarded might be entitled, under state and local rules or established practices, to a more expensive set of "appropriate" services than one classified as learning disabled.

18. The alternative formulas in this case are being compared with the actual FY 1989 Drug-Free Schools formula, which included no poverty factor. The actual Drug-Free Schools formula now in effect does reflect poverty through the inclusion of each state's Chapter 1 allocation as a formula factor.

19. The current formula for allocating Migrant Education funds also contains the same per-pupil expenditure factor, supposedly a proxy for the cost of education in a state, as influences allocations under all the other major grant programs funded under Chapter 1.

20. One important argument to the contrary is that it would not be satisfactory to allocate funds according to numbers of pupils actually served without simultaneously defining acceptable minimum levels of service. Without such a definition, states could distribute minimal or token services widely to inflate their counts of pupils served, and hence their shares of the available funds. Note that the same problem does not arise in allocating funds for the handicapped according to numbers of pupils actually served because states are required, in the case of the handicapped, to provide "appropriate" services to each child, as defined in the child's IEP.

21. The most important examples of such aid programs outside education are the Medicaid and AFDC programs, both of which distribute funds according to formulas that contain per capita income factors similar to that found in the Vocational Education formula (see GAO, 1986, for formula descriptions).

22. See, for example, Break (1980).

23. Puerto Rico and the other territories would gain about 11 percent and 8 percent, respectively, from deletion of the 0.6 limit under a rule setting their income factors equal to the highest income factor of any state.

24. The states with income factors greater than 0.62 are Mississippi (.668), West Virginia (.640), Utah (.625), and Arkansas (.624); those with factors below 0.38 are Connecticut (.329), the District of Columbia (.351), New Jersey (.355), and Alaska (.371).

25. As can be seem from the mathematical definition of the income factor, a state's allocation falls to zero (in the absence of a lower bound) if its per capita income, *PCI*, exceeds *USPCI/k*. Therefore, with $k = 0.5$, a state would have to have twice the U.S. average *PCI* (a level not actually attained by any state) to receive zero aid, but with $k = 0.8$, all states with more than 125 percent of the U.S. average *PCI* would receive zero allocations. Note also that at high settings of k, the income factor must be constrained to be greater than zero to prevent the formula from allotting some states negative amounts of aid.

26. This discussion draws heavily on the author's previous research on indicators of state fiscal capacity, as presented in a report to the U.S. Department of Housing and Urban Development (Barro, 1985) and in a subsequent shorter paper (Barro, 1986).

27. Estimates of tax exportation rates by state are reported in Barro (1985). However, these and other extant estimates of tax exportation are of dubious reliability, because many conceptual and technical problems of quantifying tax exportation have not yet been resolved.

28. The states mentioned fall into the high-tax-exportation category for a variety of reasons: Delaware because it is the headquarters for many national corporations, Hawaii because it has so much tourism, Nevada because it has a huge gambling and entertainment industry, and the District of Columbia because much of its work force and daytime population resides in its Maryland and Virginia suburbs.

29. For literature reviews and discussions of the advantages and disadvantages of various alternatives, see Barro (1985) and U.S. Department of the Treasury (1986).

30. For detailed explanations of these points, see Barro (1985, 1986).

31. Unfortunately, the most recent data on gross state products and the most recent ACIR RTS and RRS indices available for these analyses were for 1986; as a result, an extraneous factor, a difference in timing, is introduced into the interindex comparison. Yet comparing the most recent indices available, timing differences notwithstanding, may be appropriate for formula simulation purposes, because the most recent available version of an index would presumably be chosen if a decision were made to incorporate that index into a grant formula.

32. The difference between a state's score on a per capita measure of fiscal capacity and the corresponding per-pupil measure of capacity depends only on the state's pupil-to-population ratio, which means that the effect on the state's relative capacity rating of switching from one to the other should be independent of the choice of a capacity measure. In this case, however, an extraneous complicating factor, the fact that the income data are for 1988 and the other capacity data are for 1986, causes the results to vary slightly with the indicator chosen.

33. The reference to the short run pertains to the possibility that effort-based federal aid could, in the long run, induce states to spend more than they might otherwise have spent on the federally aided activities. Thus the short-run distributional effects (with effort constant) may differ from the long-run effects (with effort stimulated by federal rewards). As a practical matter, however, any incentives created by rewarding general effort to support education (as opposed to effort to support particular programs or activities) would probably be far too weak to have any discernible effects on levels of state fiscal effort.

34. Some data purporting to represent state and local outlays for education of the handicapped are presented in the previously cited annual reports of the Office of Special Education and Rehabilitative Services (e.g., OSERS, 1989), but these figures, according to the data compilers, are incomplete, unreliable, and inconsistently defined across states (personal communication). They are not close to being suitable for use as formula allocation factors.

35. To bring out the effects of the effort factor itself, the comparisons in Table 49 have been made with the lower-bound constraint (1/2 of 1 percent floor) excluded from the fund allocation formula. Thus the base case for the comparison is not the actual allocation of Chapter 2 funds but rather a hypothetical "pure" allocation in strict proportion to each state's population 5-17.

36. The reduction of the highest-capacity state's aid to zero could be avoided, if that were thought desirable, either by setting a lower bound on aid per pupil or by replacing *MAXPPI* with a standard of reference higher than the per-pupil income of the highest-income state.

37. Strictly speaking, the factor is defined as 40 percent of state per-pupil expenditure but not less than 80 percent or more than 120 percent of the U.S. average of the same variable, but the presence of the constant 40 percent factor has no effect on the resulting distribution of aid.

38. The hypothetical formula without an expenditure factor also excludes the 85 percent hold-harmless provision found in the actual Chapter 1 formula, because retaining that provision would make it impossible to observe the effects of eliminating the per-pupil expenditure variable. Note also that the allocation of Chapter 1 funds to Puerto Rico is held constant in this analysis. Allowing Puerto Rico's allocation to vary would distort the results because Puerto Rico has a per-pupil expenditure level much lower than, and not comparable with, expenditure levels in the states.

39. In addition to the ED Inspector General's report (1989), which covers only selected states, a recently released NCES report (NCES, 1991) provides a more detailed analysis of interstate differences in methods of defining and measuring ADA.

40. Specifically, ADA is computed by dividing the number of pupil-days of attendance during the school year by the number of days in the year.

41. The data on average teacher salaries used in this analysis were compiled by the National Education Association (NEA) and are reported in NEA (1989). A similar formulation of a cost-of-education index, with index weights of .75 and .25 for personnel costs and "all other" costs, is used by Rafuse (1990) in his effort to construct a cost-adjusted measure of each state's relative need for education funds.

42. The term outer bound pertains, in this context, to the absolute deviation of the index value for a state from the average value for the nation. The proposition that the teacher salary index provides an outer-bound estimate of cost variation is subject to certain qualifications. It would be contradicted, for example, if states facing above-average prices for teachers (of given quality) tended to compensate for their high price levels by hiring low-quality teachers. Such behavior seems unlikely, however, because states with high salary levels also tend to be high-income, high-spending states (even after adjusting for salary differentials), and so may be expected to use some of their above-average outlays to buy above-average teacher quality.

43. The private-sector wage data come from a Bureau of Labor Statistics (BLS) annual report on employment and wages by industry (BLS, 1989).

44. Specifically, the coefficient of variation in the per-pupil expenditure index is .15, while the coefficients of variation in the teacher salary index and the private sector wage index are, respectively, .12 and .11.

45. As Ginsburg, Noell, and Rosenthal (1985) have indicated, the formula designers were aware of this excessive variation and sought to deal with it by imposing the 80 and 120 percent bounds on the per-pupil expenditure factor, thereby limiting its range to that of a teacher salary index. But making the ranges identical is not sufficient to make the variances identical. Despite the 80 and 120 percent restrictions, the variance in the per-pupil expenditure factor is still significantly greater than the variance in relative teacher salary (see note 44).

46. A possible complicating factor is that the levels of per-pupil expenditure in these states may be high partly because of diseconomies of small-scale operation ("sparsity"), a factor often recognized in state education aid formulas. Such a scale effect, if it exists, could be construed as a legitimate cost factor not captured by indices of salaries and other resource prices.

47. It is of interest, in this connection, to note the difference in the statutory definition of "full funding" of programs in Chapter 1 and EHA. Under the former, a grant per eligible pupil of 40 percent of state average per-pupil expenditure is considered "full funding"; under the latter, the corresponding standard is 40 percent of the average expenditure per pupil in the United States--not the per-pupil expenditure of the individual state.

48. The Chapter 1 Basic Grants formula also has a lower-bound constraint, but it was latent as of FY 1989--that is, Chapter 1 appropriations had not yet reached the specified levels at which the constraint would become effective.

49. Under the Vocational Education formula, the rule that each state must receive at least 1/2 of 1 percent of the available funds is not absolute but rather is subject to the stipulation that no state may, by virtue of the rule, receive more than 150 percent of its prior-year allocation.

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