State Aid to Public Schools: An Analysis of State Responsiveness to School District Needs

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STATE AID TO PUBLIC SCHOOLS:
AN ANALYSIS OF STATE RESPONSIVENESS TO
SCHOOL DISTRICT NEEDS

John P. PELISSERO, Loyola University of Chicago
David R. MORGAN, The University of Oklahoma

Despite decades of attempted fiscal reforms throughout virtually every state, most state school aid is still allocated on a per pupil basis. The chance exists, nonetheless, that the remaining funds are at least somewhat targeted to socioeconomic or fiscal need. This research, covering two recent time periods, finds little evidence that non-enrollment-based state aid is targeted to need.

A major issue in intergovernmental relations is the degree to which state or federal aid reaches those individuals, groups, or places with the greatest need. One of the textbook justifications for intergovernmental assistance, especially federal aid, is that such funds often perform an important redistributive function. This rationale is based on the assumption, of course, that such assistance to some extent does reach those that need it most. This issue of targeting has taken on new significance recently as the federal government, under Reagan's New Federalism, has attempted to return more power, discretion, and funds to state governments. To the extent a more state-centered federalism emerges, is this likely to improve or diminish intergovernmental responsiveness to the needs of lower-level governments? How effective have state aid programs been in the past in assuring that funds reach those most in need?

Recent literature at the city level has analyzed state responses to city need. For example, a number of studies (Dye and Hurley, 1978; Stein, 1981; Pelissero, 1984) have found that state aid programs are somewhat responsive

1 We would like to thank James Granato for help with the data collection. This article is a revised version of a paper presented at the 1985 Midwest Political Science Association annual meeting. We also appreciate the helpful comments and advice from the anonymous reviewers.

Editor's note: Reviewers were Thomas Dye, David Lowery, Robert Stein, and Frederick Wirt.

State Aid and Educational Equity

As a recent assessment of equity in school finance observed, "Throughout the Twentieth Century, the criterion of fairness has been continually applied to the American system of education" (Berne and Stiefel, 1984:270). But fairness for what or whom? Berne and Stiefel (1984:7) contended that equity applies to two groups—children and taxpayers—and that most reform efforts try to take account of both in devising various state aid formulas. Although this is not the place to provide a detailed discussion of the history of the movement to equalize educational funding, we do need to consider briefly the various concepts of equity and to weigh the arguments in behalf of using state money to level up poor districts.

For a good bit of this century educational reformers have searched for ways to reduce interdistrict disparities in per pupil expenditures (see Friedman and Wiseman, 1978). The problem has been, quite simply, that, since local support for public education comes predominantly from the property tax, local school
funds are determined largely by the property wealth of the district. In fact, under one definition, equity exists when a child's educational opportunity does not depend on his or her parent's economic circumstances or geographic location (Wise and Darling-Hammond, 1981:298). State aid has been viewed historically as one important means of weakening this link between local resources and school spending.

More recently, a renewed effort to channel greater state resources to needy districts has swept the country. A number of states now distribute funds specifically for various categories of "disadvantaged" students, while nine states offer specific adjustments for poverty (Goertz, 1981). In all, this movement to improve equity has been termed the educational issue of the 1970s, as some 28 states reformed their system of school aid largely in hopes of improving funding equity (Fuhrman, 1982). Some contend this effort has paid off. According to Odden (1982), "Important progress was made in reducing the relationship between per pupil expenditures and local property wealth per pupil, with the reform states making more progress on this goal."

...others (Geski, 1982) have disagreed. Thus the extent to which recent events have reduced the historical nexus between local wealth and school spending appears to require further investigation.

An analysis of the extent to which state money reaches districts most in need should proceed within the context of an overall examination of those factors that determine the distribution of state aid to local schools. Empirical research on this subject in which a large number of districts are used is less prevalent than expected. Most of the studies include state aid as one of several variables to explain variations in per pupil expenditures, with a particular concern for the extent to which state funds have an equalizing effect. The basic conclusion: "Where there is greater relative use of state aid, there is consistently less inequality of expenditures" (Harrison, 1976:50). In effect, considerable research suggests that those districts with fewer financial resources tend to receive proportionately more state aid than other districts.

The literature on state funding indicates no clear-cut pattern with regard to the effects of the distribution formula itself. Cohn (1974:37) argued that the type of financial plan used and the percentage of state funds relative to total school costs are the two most important variables determining the equalizing effect of state aid. Brown and Elmore (1982:132), however, insisted that the type of formula employed is not the decisive factor in determining the equity impact of state funding. At this point, then, we will tentatively assume that the amount of non-enrollment-determined state aid received by local districts will be unrelated to the type of distributional formula used, when other variables are taken into account.

One other potential influence on state aid should be considered. Johns and associates (1983:167) insisted that where a state contains a large number of districts, each individual district is likely to receive proportionately less...
intergovernmental aid, Pelissero (1984) has suggested an alternative dependent variable that permits the researcher to concentrate on the proportion of aid not determined by population. This can be done by regressing state aid on school district enrollment figures to produce a residual aid measure free of the confounding effects of enrollment. The formula essentially assumes the following:

\[
\text{State Aid} = f(\text{Enrollment}) + \text{Error}
\]

The residualized measure thus created represents that portion of state money that is allocated on some basis other than enrollment.\(^3\) Residual state aid for the 173 school districts is then examined at two time points, 1971 and 1981. Because of the flurry of public school finance reform activities during the 1970s, we suspect that states were not good targeters during the initial period. By 1981, however, more responsiveness to local socioeconomic and fiscal needs should be apparent. (The identical 173 school districts are employed in both years' analysis.)\(^4\)

Next the various indicators of the districts' fiscal need should be described. The most commonly used measure is property value per student, although some studies also include family income. Unfortunately district property values are not widely available across states. In lieu of such a measure, this analysis will include the following as fiscal need variables:

1. school district budget deficit (revenue less expenditure) per pupil (1971, 1981);
2. local revenue base (own-source revenue) per pupil (1971, 1981).\(^5\)

District socioeconomic need will be represented by the following school-district- (not city-) level measures:\(^6\)

- measures is "a dangerous strategy," since "without per capita transformations everything would be related to everything" (p. 182).
- Using per capita dependent variables was considered as an alternative strategy. An analysis using both a residual measure of state aid and a per capita measure was undertaken. The results were quite similar in large part because these two types of aid measures are very much alike. This appears in the simple correlation between residual state aid and per capita state aid: \(r = .82\) in 1971 and \(.84\) in 1981.
- These school districts include many large county and areawide districts in addition to the majority of central city districts. Districts excluded because of incomplete information or strong deviations from the sample were: Hawaii Schools, Houston Independent, Los Angeles Unified, Louisville City, Montgomery County (Maryland), New York City, North East Independent (Texas), Philadelphia, St. Louis, and Sweetwater Union High (California).

Per capita measures of the socioeconomic variables were employed in this analysis because they were more readily available in the above sources. The use of certain residual measures of socioeconomic need in this analysis, following Pelissero (1984), did not change the substantive findings, largely because of the close similarity between the two transformed measures. For example the correlation between percent unemployed and residual unemployment was very high: \(r = .68\) in 1970 and \(.70\) in 1980.

\(7\) State system data were obtained as follows: (a) number of school systems (1972, 1982), spending per pupil (1971, 1981), and state aid provided on an equalizing basis (1982) from the state, 1971, 1981, from Book of the States for 1972-73 (p. 312) and 1984-85 (p. 365); (c) state and local government aid provided on an equalizing basis for 1972 from Public School Finance Programs, 1971-72, Table 1; and (d) finance reform activity from Brown and Elmore (1982:108).
a much smaller increase in slope should have occurred over the ten-year period.

In effect, it appears that for most large districts around the country all the activity by state government during the 1970s to improve educational equity has gone for naught. Enrollment is the dominant force determining state aid has not increased as much now as ten years ago. We should hasten to add, of course, that a hefty amount remains to be allocated on some other basis. Thus we employ the residuals—that 10 or 12 percent of state aid not determined by enrollment variables—as the new dependent variables for the remaining analysis.8 The important questions at this point are the following: How much of the residual aid is associated with district socioeconomic need? How much is targeted to the fiscal needs of the school districts? And, how important are state system variables in the determination of this residual?

Table 1 displays the multivariate model of residual aid and two of the need variables that are significant simple correlates of aid in either 1971 or 1981. (The minority, poverty, and deficit measures did not attain significance.) For 1971 both the socioeconomic need variable (unemployment) and the fiscal need variable (own revenue) are significant determinants. Own revenue per pupil is the strongest need predictor, with school district unemployment also a prominent effect. This initial year model demonstrates that higher residual state aid payments were, as expected, associated with greater need in school districts. Specifically, for every dollar per pupil that a school district was able to raise on its own there was a corresponding decrease of $9,776 in residual state aid. Likewise, a 1 percent increase in a district’s unemployment was associated with a more than a $1 million increase in such aid.

The 1981 model shown in Table 1 differs slightly from the earlier year’s equation. Again, our revenue per pupil is the strongest predictor, with each increase in own-source revenue producing a $9,094 increase in school district unemployment, which was as expected, associated with greater need in school districts. Specifically, for every dollar per pupil that a school district was able to raise on its own there was a corresponding decrease of $9,776 in residual state aid. Likewise, a 1 percent increase in a district’s unemployment was associated with more than a $1 million increase in such aid.

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The model for 1981 reinforces what was found in state school aid. The overall model for 1981 demonstrates that higher residual state aid payments were, as expected, associated with greater need in school districts. Specifically, for every dollar per pupil that a school district was able to raise on its own there was a corresponding decrease of $9,776 in residual state aid. Likewise, a 1 percent increase in a district’s unemployment was associated with more than a $1 million increase in such aid.

Hypotheses 3 through 5 address the relationship between residual aid and several structural components of the state systems. While distributing state aid on an equalizing basis did not correlate significantly with the dependent variable, the other two state system measures—school systems per 10,000 population and school finance reform—were important enough correlates in

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8 Ten percent of state aid is still a large sum of money. For our 173 school districts, there was an average of $2.4 million in non-population-based state aid in 1971 and an average of $6.2 million in 1981.

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### TABLE 1

<table>
<thead>
<tr>
<th>Predictors</th>
<th>1971</th>
<th>1981</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Socioeconomic Need</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployment (%)</td>
<td>1,041,746.74*</td>
<td>1,668,432.93*</td>
</tr>
<tr>
<td><strong>Fiscal Need</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Own revenue/pupil</td>
<td>-9,775.84*</td>
<td>-9,094.39*</td>
</tr>
<tr>
<td>(Constant)</td>
<td>1,905,803.34*</td>
<td>1,905,464.60</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.11</td>
<td>.09</td>
</tr>
<tr>
<td>$F$</td>
<td>10.20*</td>
<td>8.75*</td>
</tr>
</tbody>
</table>

Note: Residual state aid is unstandardized. The dependent variable reflects the actual dollar difference between the observed state aid and that predicted by school district enrollment. A similar regression using the standardized residuals produced identical regression coefficients (beta, $R^2$, and $F$). Only the unstandardized slope coefficients (b) and the constants are different in the analysis reported here.

*p ≤ .05.

### TABLE 2

<table>
<thead>
<tr>
<th>Predictors</th>
<th>1971</th>
<th>1981</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Need Measures</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Own revenue/pupil</td>
<td>-9,264.78*</td>
<td>-9,297.32*</td>
</tr>
<tr>
<td>Unemployment (%)</td>
<td>1,061,655.68*</td>
<td>1,708,502.99*</td>
</tr>
<tr>
<td><strong>State System Measures</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School districts/10,000 population</td>
<td>-1,250,467.44*</td>
<td>1,102,946.76</td>
</tr>
<tr>
<td>School finance reform</td>
<td>4,582,230.93*</td>
<td>6,483,633.01*</td>
</tr>
<tr>
<td>(Constant)</td>
<td>2,396,273.79</td>
<td>-7,330,507.81</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.14</td>
<td>.11</td>
</tr>
<tr>
<td>$F$</td>
<td>6.99*</td>
<td>5.37*</td>
</tr>
</tbody>
</table>

Note: Residual state aid is unstandardized. The dependent variable reflects the actual dollar difference between the observed state aid and that predicted by school district enrollment. A similar regression using the standardized residuals produced identical regression coefficients (beta, $R^2$, and $F$). Only the unstandardized slope coefficients (b) and the constants are different in the analysis reported here.

*p ≤ .05.
State Responsiveness to School District Needs

Although these findings confirm much of the previous research on state aid to local schools, there are several ways in which this study is different. Our analysis focuses more directly than other research on that component of aid that is not determined by enrollment. And those assumptions about the interplay between district need and state aid have been tested with a sizable sample of the nation's largest school districts. The use of two time periods provides a perspective over time that has often been lacking in earlier research. More particularly, our knowledge of the determinants of aid has been extended in several ways. First, this analysis reveals that overall state aid is as enrollment driven in the early 1980s as it was a decade earlier. This finding supports those who have argued that on balance the various reforms to state aid systems implemented during the 1970s contributed little or nothing to greater educational equity. Second, the analysis of residual state aid shows little targeting on the basis of a district's socioeconomic needs. Some responsiveness to district fiscal needs is apparent, however. But perhaps less so now than ten years ago. Further, it is not the particular formula for distributing aid that matters, nor do state school finance reforms and the number of school districts in a state appear to affect state aid more than marginally. Finally, while the regression models do not explain the majority of the variance, we should remember that 90 percent of this aid variance has already been explained by district enrollment. We have simply attempted to explain a bit more of the remaining variability in school aid allocation.

We do not intend to suggest that these models of residual state aid provide a complete picture of how state aid is allocated to local districts. But some important assumptions have been tested using the best data available at this time. Hence, we believe the limitations of the model (or its specification) are largely attributable to the data at hand. Such limitations can only be overcome, we suspect, through a more detailed analysis of intrastate variations to school district need. This appears to be the next step for researchers seeking to understand the differences between the responsiveness of "State A" versus that of "State B" in the school aid area. A state-by-state examination of state policy in funding local school costs would also control for the effects of 50 separate state aid systems—the existence of which we tried to address by including the state-level factors as part of the cross-sectional analysis.\(^\text{10}\)

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\(^9\)The state governments for our 173 school districts supported an average of 73 districts for every 10,000 state residents in 1971. By 1981, consolidation in the states had reduced this figure to 82 districts for every 10,000 state residents.

\(^{10}\)One reviewer has objected to using cross-state data to test the basic hypothesis that residual aid is being targeted to local districts on the basis of need, insisting that only an intrastate analysis can answer this question. No doubt, intrastate analysis is crucial. But in the meantime we contend that information about whether St. Paul receives more or less residual aid than Gary, when certain characteristics of the state's funding system are taken into account, is indeed useful in addressing the issue of responsiveness. This cross-sectional analysis of pooled data also permits us to learn more about how the largest school districts in the country are treated by the states. These districts generally have the greatest problems and needs, which place a heavy burden on state governments. (These large districts represent only about 1 percent of all the school districts in the country, yet in 1981 they collectively received about 30 percent of all state aid.) Moreover, most states...
this point we simply conclude that non-enrollment-based state aid is only somewhat responsive to school district needs. SSQ

REFERENCES


have only a few districts with large (25,000+) enrollments, and an in-state analysis of such states' responsiveness may not be very revealing. Therefore we think a pooled data set can be used to do a comparative analysis of state responsiveness to answer the question: do those needy districts around the country receive more state assistance than their better-off counterparts? Whatever the answer in general, a comparative intrastate analysis undoubtedly would reveal that some states are better targeters than others. Nonetheless, we contend that the overall question can be addressed profitably with the design employed here.
INTERGOVERNMENTAL AID FOR CITIES AND SCHOOLS: A COMMENT ON RESEARCH METHODS

John P. PELISSERO, Loyola University of Chicago
David R. MORGAN, The University of Oklahoma

The literature on intergovernmental aid and its responsiveness to needs in cities and school districts has been growing since the mid-1970s. Researchers have explored the fundamental political question of "who gets what" from alternative perspectives that have enriched our understanding of federal and state aid for local governments. This research has also stimulated discussion and debate over two policy analysis questions: (1) how to control for the confounding effects of different population bases in cross-sectional studies of aid receipts by city governments and school districts; and (2) how to account for differences in state aid systems when analyzing a pooled cross-state data set of local governments. These questions are again addressed in the Pelissero and Morgan article and the piece by Lyons and Fitzgerald in this issue. Since Lyons and Fitzgerald take a strong position regarding certain methodological issues evolving from these questions, a position that objects specifically to certain techniques we employ to control for the effects of population, we think a response and further elaboration on our part is appropriate.

Lyons and Fitzgerald deal first with the basic question of how to control for population differences in cross-sectional analysis of state responsiveness to city needs. This issue, first raised in the intergovernmental aid literature in Ward's (1981) critique of Dye and Hurley's (1978) responsiveness research, concerns the appropriateness of per capita measures of city government aid receipts and social and economic need. What we have done in the analysis of school district aid in this issue and in our separate research (e.g., Morgan and England, 1984; Pelissero, 1984, 1985) is to explore alternative means of studying state aid responsiveness. We have not and do not reject per capita measures as inappropriate in all state and urban policy research, as suggested by Lyons and Fitzgerald. Rather, we search for ways to better understand intergovernmental aid allocations that are population-driven—whether of federal (Coneloland and Meier, 1984) or state origin (Ward, 1981; Pelissero,
The use of residual measures of aid is appropriate for such an analysis (Kmenta, 1971:201-5) because residual measures (1) are derived from a linear transformation rendering them well suited for use in the general linear model; (2) are independent of population, or the variable used to produce them; and, most importantly, (3) permit one to examine the discretionary portion of state aid and those factors influencing its allocation (e.g., state/local politics, local needs, legal-structural arrangements). Further, as Lyons and Fitzgerald acknowledge, a dependent variable residualized by population is interpretable. Far from producing "artifacts," the residual analysis provides another way of exploring the responsiveness issue, a method that does follow the logic of social theory in key ways.

First, we are attentive to important components of social theory and do examine population and enrollment influences. Enrollment is the first variable taken into account in our study of aid to public schools, for example, and it alone explains from 88 to 90 percent of the variation in state school assistance. This is an important finding, one which we do not ignore. Indeed, learning that school aid is still largely enrollment-driven despite more than a decade of school finance reform is quite significant. Beyond that, we want to know what else matters in aid receipts of local governments. Second, population/enrollment adjustments in the predictors of residual aid are appropriate, although the form of the independent measures (residual or per capita) is somewhat subjective. The key question is, Would the substantive results change significantly if the other form of the variable (i.e., per capita) were employed? In our case the coefficients in the regression or correlational analysis would be different, but the findings would still be the same. One of the reasons for this is the close similarity between the two measurement forms of the same concept. This can be seen by correlating the per capita (or percentage) and residual measures of the same 1970 social need predictors used in Pelissero (1984):

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>NonwhiteRes-%Nonwhite</td>
<td>.82</td>
</tr>
<tr>
<td>ElderlyRes-%Elderly</td>
<td>.82</td>
</tr>
<tr>
<td>PovertyRes-%Poverty</td>
<td>.83</td>
</tr>
<tr>
<td>MobilityRes-%Mobile</td>
<td>.62</td>
</tr>
</tbody>
</table>

The same concept is being measured with either indicator when the correlations are so high. The substitution of the per capita measures for residual need measures in the regression analysis produces different coefficients, but the same finding emerges; residual aid to cities in 1976 is responsive to economic and fiscal need but has not improved in its targeting to social need from the 1962 pattern (Pelissero, 1984: tables 3 and 4).

The second question—how to account for difference in state aid systems when analyzing pooled data—is an additional concern of Lyons and Fitzgerald (in their comments on Pelissero, 1985). This concern is addressed in footnote 10 in our article in this issue, in response to the same point made by one of our referees, and in our conclusion to that paper. First, we admit that the ideal design would allow for an intrastate analysis for the reasons outlined by Lyons and Fitzgerald. Quite often, however, data are not available for cities or school districts below a certain size, either 25,000 or 50,000 population. In such cases, the N within any one state may be quite limited, precluding a thorough cross-sectional analysis. In some instances, it may prove possible to gather enough data on a large group of local jurisdictions within certain populous states to reach a respectable total N. Unless one wants to generalize from only one state or perhaps from only a very few such large states, or unless a massive nationwide data set is available permitting intrastate analyses within a large number of states, the problem is not easily resolved.

In our foregoing article we try to take account of various state differences in school structure as a partial substitute for individual state variations. This option is not altogether satisfactory, but should control for some of the potential level-of-analysis problems raised by Lyons and Fitzgerald. Their criticism, of course, can be levied at any effort to assess variations in targeting by state governments that relies on cross-sectional pooled data across a number of states regardless of the technique employed to create the independent and dependent variables.

In sum, the issues raised by Lyons and Fitzgerald are obviously worth further consideration and debate. We do not contend that our regression-based technique of controlling for population effects should be universally used in lieu of the ratio measures more commonly employed in cross-sectional analysis. In certain special cases where population is particularly dominant, however, it seems to us an attractive way to remove that confounding effect. No
one quarrels with the view that a comprehensive state-by-state analysis will produce the most precise estimates of the targeting effects of state aid. This approach certainly appears to be the next step in ascertaining whether, for example, Tennessee or Oklahoma more effectively employs state dollars to meet local government needs. SSQ

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