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AUTHOR Lee, Jaekyung
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ABSTRACT

Given state activism in education reform during the 1980s, a major concern in the development of education policy is whether reform states have increased their financial support for education in order to achieve desired objectives. This paper describes findings of a study that explored the distributive nature of state and local policy choices in education through comparative analyses of their long-term fiscal effort for three distinctive public services--welfare, highways, and police. The study built upon the unitary model of taxation and expenditure policies. The findings imply that policy shifts may have led to changes in educational expenditure patterns. Providing the general structures of state-level distributive effects, multilevel analyses suggest that the first wave of state reform affected not only fiscal effort for education but also distributive tendencies in education expenditures. While state reform appeared to increase the level of resources allocated to public education versus other social services, the distributive effects of state education reform tend to vary among states with different racial compositions. Redistributive tendencies in education expenditures tend to be accompanied by a low level of fiscal effort for education. In addition, developmental versus redistributive tendencies in education expenditures tend to be highly conflicting. One figure, 5 tables, and 13 endnotes are included. (Contains 36 references.) (LMI)

State and Local Policy Choices and Fiscal Effort for Education: Exploratory Analysis of the Distributive Effects of State Education Reform

Jaekyung Lee
Department of Education
University of Chicago

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Abstract

Building on the unitary model of taxation and expenditure policies, this study explores the distributive nature of state and local policy choices in education through comparative analyses of their long-term fiscal effort for three distinctive public services. Given state activism in education reform during the 1980s, the findings of this study imply that policy shifts may have led to changes in educational expenditure patterns. Providing the general structures of state-level distributive effects, multi-level analyses suggest that the first wave of state reform affected not only fiscal effort for education but also distributive tendencies in education expenditures. While state reform turned out to increase the level of resources allocated to public education versus other social services, the distributive effects of state education reform tend to vary among states with different racial compositions. Redistributive tendencies in education expenditures tend to be accompanied by a low level of fiscal effort for education. In addition, developmental versus redistributive tendencies in education expenditures tend to be highly conflicting.

Given state activism in education reform during the 1980s, a major concern in the development of education policy is whether reform states have increased their financial support for education in order to accomplish intended changes. Although education reform states have been quite aggressive in finding new sources of revenues for public schools, new state dollars restricted to reform activities were at the margin of education support (Verstegen and McGuire, 1991).[1] Moreover, it is not clear whether state education reform has a fiscally stimulating effect where additional local resources are allocated to public schools. While attention to the simultaneous pursuit of fiscal equity and educational excellence has been urged, it is unclear how state and local systems have allocated educational resources to affect the social distribution of learning opportunities and academic achievement. As policymakers directed their attention toward excellence in education and away from issues of equity in educational opportunity, judicial and legislative efforts to equalize school funding slowed considerably in the second half of the 1980s (Barton, Coley, and Goertz, 1991). Moreover, it is unlikely that states will address the needs of disadvantaged students in times of budgetary stress (Wong, 1991).

In light of these concerns, we need to understand whether and how state and local governments in the U. S. federal system have changed their allocative practices. Since states and localities have an interest in policies that enhance their economic well-being, public policies are treated differentially, depending upon their impact on the economic vitality of the community (Peterson, 1981).[2] Developmental policies enhance the economic position of political systems whereas redistributive policies benefit low-income residents but at the same time negatively affect local economy. Thus, the critical policy choice is between redistribution and development. Indeed, the 1983 national report, *A Nation at Risk*, attributed economic decline to the poor performance of public education in the United States. Concerns for economic development motivated states to compete with each other in the scope of reform initiatives.[3] Even though the reform activities did not lead to a major redistribution in spending between sectors of government or to an increase in taxpayers' willingness to pay for education, they may have reinforced that willingness and helped target ideas about how funds should be spent (Firestone, 1990). Further, as state and local governments are required to reconcile expenditure priorities with limited tax resources, there is

heightened public attention to the way public education is aligned with other social services that affect needy children (see Adler and Gardner, 1994).[4]

Notwithstanding the seemingly developmental tendency of state education reform (Odden and Marsh, 1989), we need to examine whether critical policy choices, as reflected in general education expenditure patterns, have been led by longstanding public devotion to equality of educational opportunity (i.e., redistributive tendency) or by increasing public interests in improving the quality of public schools (i.e., developmental tendency). The distributive nature of educational expenditures, however, is more difficult to discern at the state and local district levels than at the school and classroom levels because real beneficiaries can hardly be identified.[5] Thus, this study takes a comparative approach in that fiscal effort for public education is related to fiscal effort for other public services which represent developmental and redistributive policies. On the other hand, when making inferences about policy choices from expenditure patterns, it is necessary to consider equally stable, external, non-economic sources of influence on state and local policymaking (Wong, 1990). Thus, between-state differences in policy activities and contextual factors are taken into account in examining interstate variation in the time-series patterns of education expenditures.

Analytic Framework and Assumptions

During the early 1980s, many states increased course credit requirements for graduation, raised standards for teacher preparation, and established statewide student assessments. Despite the stronger policy-making and administrative role of the state in the functional areas, interstate divergence in school financing is reported (Wong, 1989a). Further, given the number of "unfunded" initiatives and/or the relatively low magnitude of dedicated funds for education reform policies and programs, it appears that numerous education reform initiatives have been leveraged through lump-sum funding increases (Jordan and McKeown, 1990). While local districts are the critical organizational levels with respect to resource allocation, they often routinize the delivery of educational services subject only to efficiency considerations. However, the decisions of governments to adopt rational

service delivery rules can differentially benefit citizens (Jones, Greenberg, Kaufman, & Drew, 1978).

Schooling services can be classified as more of a developmental policy or more of a redistributive policy depending on the degree to which the benefits of schooling are distributed either in proportion to the amount paid for the services or to all members of the community equally (Peterson, 1981). While it is difficult to apply the development-redistribution distinction to the provision of routine services such as public safety and other housekeeping activities, public education covers various kinds of programs and activities at different levels of school organization such that both developmental and redistributive tendencies can be found in allocative practices. Even when we narrowly define the benefits of schooling in terms of money spent on public education, it is not feasible to directly examine the distributive nature of general education expenditures at the highly aggregate level. Thus, I decide to compare education expenditures with expenditures on other major public services where the distributive nature is treated as known and fixed: highways and welfare are chosen for both conceptual and empirical reasons.

Highways and welfare are often regarded as bipolar in terms of benefit/tax ratio (Peterson, 1981). Those policies which can be financed out of user charges paid by community residents or taxes levied on users of the service can usually be treated as developmental policies: highways are typical of the latter case. By contrast, welfare is representative of redistributive policies in that primary beneficiaries are not identical to taxpayers. On the other hand, previous studies of public expenditures found differential determinants of expenditures on highways and welfare.[6] For example, in an attempt to differentiate among different kinds of public policies, Sharkansky and Hofferbert (1969) empirically distinguished two major categories through factor analysis: "welfare and education" and "highways and natural resources." Further, cross-sectional comparisons of public expenditures indicated differential fiscal responsiveness of major public services to changes in fiscal capacity. For example, Borcherding and Deacon's (1972) study of 6 public services in 44 states showed that police, fire, sanitation, and park-recreation are income elastic while health, local education, and highways are income inelastic.

Figure 1

Because state-local relationships are so intertwined, it is necessary to examine the combined expenditures of state and local governments. The comparable unit of analysis thus becomes the fifty state-local government systems. I also choose to examine general expenditures as percent of personal income so that the cross-state comparison can be adjusted for between-state differences in fiscal capacity.[7] Figure 1 shows that the aggregate trend of state and local fiscal effort varies among major public services over last two decades. In the literature on public expenditures, some attention has been paid to the issue of whether public services are an essential good or luxury good[8], but not to the issue of how the delivery of public services relates to the expenditure patterns. Given their fiscal constraints and taxpayers' preferences, state and local governments are required to efficiently allocate resources among competing public services. Thus, an increase in fiscal effort for developmental policies is likely to lead to a decrease in redistributive ones, and vice versa. It is not only the fiscal effort for education itself but also its relation with fiscal effort for other public services that is major concern of this study. The point I wish to make in this study is based on the observation that the same types of public services tend to follow the same income expansion path. As shown in Table 1, the factor analysis of state and local expenditures as percent of personal income during 1971-1990 shows that the selected five public services are differentiated into two categories. Each of the two factors retained may be named "development" and "redistribution" in that the observed factor loading pattern, especially for highways and welfare, meets the expectation of the policy typology.

Table 1

Policy Shifts and Expenditure Patterns between 1971-1990

During the last decade, there has been a subtle shift in the basic goals of the American education system from an emphasis on equity and freedom of access to concern for quality education and an awareness of the importance of higher order skills (Mitchell, Roysdon, Wirt, & Marshall, 1990). Moreover, since the Reagan administration, the resurgence of the states' role in

American federalism had led to growth management and the provision of new infrastructure to enhance economic development (Nathan, 1990).[9] Along with new policy priorities and fiscal relations among the three levels of government, the first wave of state education reform may have affected the time-series patterns of state and local education expenditures by changing not only the level of resources allocated to public education but also within-sector distribution. Thus, in order to examine the relationship between policy shifts and expenditure patterns during last two decades, the 20-year data set is roughly decomposed into the period of state education reform (1982-1990)[10] vs. pre-reform period (1971-1981). The education expenditure patterns of these two periods is separately analyzed.

Given multivariate relationships between education and other public services, any potential change in education expenditure patterns during the last two decades is examined by regressing fiscal effort for education on fiscal efforts for welfare and highways while controlling for fiscal capacity and federal aid as well as temporal and spatial effects. Let E_{it} represent fiscal effort for education (i.e., the proportion of per capita income spent on elementary and secondary education for state i and year t), and let H_{it} and W_{it} each represent fiscal efforts for typical developmental and redistributive policies (i.e., the proportion of per capita income spent on highways and on welfare for state i and year t). Suppose that the E_{it} is determined by an equation of the form

$$E_{it} = \delta_i + \sigma_t + X_{it}\beta + H_{it}\rho + W_{it}\tau + \varepsilon_{it} \qquad (1)$$

where δ_i represents a fixed effect for each state, σ_t represents a fixed effect for each year, X_{it} represents a set of measured covariates (per capita income and federal aid), and ε_{it} represents a stochastic error term. Equation (1) assumes a linear specification of the relation of education expenditures with other major expenditures (i.e., highways and welfare), consisting of two components: developmental tendency (ρ) and redistributive tendency (τ).

Table 2

Separate OLS regressions are conducted for the two periods to examine whether and how fiscal relations of education to welfare and highways have

changed during the last two decades. As shown in <Table 2>, it is worth noting that fiscal effort for education is positively associated with both fiscal effort for welfare and fiscal effort for highways. However, the strength of fiscal relations is different between the two periods. While the fiscal relation of education to welfare is twice as strong as the fiscal relation of education to highways in the pre-reform period, the pattern of fiscal relations is reversed in the reform period. It implies that a predominant policy tendency in elementary and secondary education may have shifted from redistributive to developmental at the aggregate state level. In addition, the negative relation of fiscal capacity to fiscal effort for education suggests that public education is regarded as a necessity.[11] Finally, the negative change in the impact of federal aid implies that the supporting role of the federal government in state and local school finance has deteriorated. On the other hand, in this OLS analysis, an implicit assumption is that the utility function remains unchanged over the sample space. However, diverse backgrounds of the 50 states make differences in preferences more likely so that observed education expenditure patterns relative to highways and welfare can vary among states and modeling any between-state differences in the developmental (i.e., variation in ρ) and redistributive (i.e., variation in τ) tendency of education expenditures.

Multi-level Analysis of the Fiscal Effects of State Education Reform

Building on the relationship between policy choices and expenditures patterns, this study attempts not only to estimate the developmental and redistributive tendency of state and local education spending during the last decade of state education reform, but also to explain interstate variation in their inferred policy choices. This research involves a hierarchical data structure, which requires an application of the hierarchical linear model, HLM (see Bryk and Raudenbush, 1992). Multiple observations are gathered over the reform period (1982-1990) on whole states to examine interstate variation in education expenditure patterns. At Level 1, each state's fiscal effort for education is represented by a growth trajectory that depends on a unique set of parameters. A major concern is interstate variation in average fiscal effort for education and its relations to fiscal efforts for highways and

welfare. These parameters become the outcome variables in a Level-2 model, where they depend on some state-level characteristics.

The time-series patterns of state and local fiscal effort for education during the 1980s show curvilinear growth trajectories, which lead to a quadratic growth model. At Level 1, it is assumed that $(FEDUC)_{ti}$, the observed fiscal effort for education at year t in state i, is a function of systematic growth pattern plus random error (see Equation 2). A visual examination of the state's growth trajectories in fiscal effort for education indicated a nonlinear growth pattern, suggesting a quadratic growth model as in Equation 2. The centering parameter was deliberately set at year 1984 when the first wave of education reform was at its peak. Per capita income, fiscal efforts for highways and welfare, and federal aid are specified as time-varying covariates, that is, other level-1 predictors, besides time, that explain variation in fiscal effort for education.

$$(FEDUC)_{ti} = \pi_{0i} + \pi_{1i}(YEAR)_{ti} + \pi_{2i}(YEAR)^2_{ti} + \pi_{3i}(FISCAP)_{ti} + \pi_{4i}(FEDAID)_{ti} + \pi_{5i}(FHIGH)_{ti} + \pi_{6i}(FWELF)_{ti} + e_{ti} \quad (2)$$

$(FEDUC)_{ti}$ is fiscal effort for education, i.e., the ratio of education expenditures to personal income in state i;
$(YEAR)_{ti}$ is -2 to -1 for 1982 to 1983, 0 for 1984, and 1 to 6 for 1985 through 1990.
$(FISCAP)_{ti}$ is per capita income in state i.
$(FEDAID)_{ti}$ is per capita federal aid in state i.
$(FHIGH)_{ti}$ is fiscal effort for highways, i.e., the ratio of highways expenditures to personal income in state i.
$(FWELF)_{ti}$ is fiscal effort for welfare, i.e., the ratio of welfare expenditures to personal income in state i.

The seven level-1 parameters, i.e., an intercept and six regression slopes, may be interpreted as follows:
π_{0i} = the average fiscal effort for education of state i in 1984.
π_{1i} = the instantaneous growth rate of state i in 1984.
π_{2i} = the acceleration or deceleration during the reform period, i.e., 1982-1990;
π_{3i} = the relation between fiscal capacity and fiscal effort for education in state i.

π_{4i} is the relation between federal support and fiscal effort for education in state i.
π_{5i} = the fiscal relation of education to highways in state i. I refer to this as the developmental tendency of education expenditures.
π_{6i} = the fiscal relation of education to welfare in state i. I refer to this as the redistributive tendency of education expenditures.

The first step in the HLM estimation process involves fitting an unconditional, or random regression, model. Among the seven π coefficients, only three ones (i.e., π_{0i}, π_{5i}, and π_{6i}) are treated as random at the state level. A distinctive feature of HLM is that these structural relations are presumed to vary across states. For each π coefficient in the time-series model, the Level-2 model is simple:

$\pi_{pi} = \beta_p + r_{pi}$ for p=0, 5, 6 (random)
$\pi_{pi} = \beta_p$ for p=1, 2, 3, 4 (fixed)

where β_p is the mean value for the state-level effects.

Table 3 presents the results. The mean fiscal effort for education in 1984 is 4.58, which means that approximately 4.6 % of personal income was spent on elementary and secondary education at the aggregate state level. Both the mean growth rate in 1984 and the mean acceleration is positive and significant. This indicates that, on average, state and local governments were increasing their fiscal effort for education at an increasing rate during the last decade. In general, the average growth rate in any particular year is the first derivative of the growth model evaluated in that year. For quadratic growth,

growth rate in year t = $\pi_{1i} + 2\pi_{2i}$ (Year)

In 1982, for example, the mean growth rate is close to zero [.039+2(.01)(-2)=-.001]. By 1990, the mean growth rate has modestly grown to .159.

On the other hand, the estimates of time-varying covariates are basically congruent with the results of the previous OLS regression. Both the effects of fiscal capacity and federal aid on fiscal effort for education are negative and significant. At the same time, both the fiscal relation of education to highways and to welfare are positive and significant. In addition

to estimating the mean time-series regression equation, the correlations among the random effects indicate the general structure of distributive state effects. A high average level of fiscal effort for education is associated with pro-developmental (r = .457) and anti-redistributive (r=-.767) tendencies in education expenditures. There is also a extremely negative association between the developmental tendency and redistributive tendency (r = -.905). This high correlation suggests that these two distributive effects may share substantial common causes.

An indicator of the reliabilities of the random effects in these data may be derived by comparing the estimated parameter variances, Var (β_p), for each random effect to the total observed variance in the least squares estimates of these effects, Var ($\hat{\beta}_p$) (see Bryk and Raudenbush, 1992). These results are also displayed in Table 3. The estimates of average fiscal effort for education in 1984 are highly reliable (.996). By contrast, the other random regression coefficients are less reliable, implying that much of the observed variability in distributive effects is sampling variance and, as a result, unexplainable by state factors. Nevertheless, the results of homogeneity of variance tests (see the Chi-Square Chart in Table 3) indicate significant variation among states in the distributive effects. The interstate variation in fiscal effort for education in 1984 and the developmental and redistributive tendency in education expenditures are hypothesized to be explained by the level of state policy activities and contextual factors.

Given the comprehensive nature of reform legislation, it is meaningful to study the cumulative fiscal effects of all state reforms in omnibus bills. An objective measure of state "activism" in education reform is constructed by measuring 50 states and calibrating 26 policies through the Rasch measurement method (See Table 5).[12] The higher score means that the state is more active in adopting standards-based education policies during the early 1980s: most of the leading states in the first-wave education reform are concentrated in the South with relatively large black populations. On the other hand, educational policy choices are often constrained by contextual factors such as racial composition, which affects key decision points in the policy processes of determining "who gets what" (Meier, Stewart, and England, 1989). While most education policies of the 1980s intended to benefit all students, their ultimate distributive effects would depend on the way in which the decision-making on resource allocation is made. Different

reform effects by context are represented by the inclusion of a state reform-by-composition variable interaction (for example, REFXPWH = REFORM X PWHITE). After testing a series of conditional models, I came up with the following between-state model at Level 2:

Fiscal effort for education in 1984 = f (AVINC, PREFED, PWHITE, REFORM, REFXFED).
Developmental tendency = f (PREDEV, PWHITE, REFORM, REFXPWH).
Redistributive tendency = f (PRERED, PWHITE, REFORM, REFXPWH).

$(AVINC)_i$ is the per capita income averaged across 1982-1990 in state i.
$(PREFED)_i$ is the fiscal effort for education averaged across 1970-1981 in state i.
$(PWHITE)_i$ is the standardized logit of percentage white population in state i (as observed in 1980).
$(REFORM)_i$ is the standardized Rasch measure of state i's policy activities in standards-based education reform (as observed in 1984).
$(PREDEV)_i$ is the estimated fiscal relation of education to highways during 1970-1981 in state i.
$(PRERED)_i$ is the estimated fiscal relation of education to welfare during 1970-1981 in state i.
$(REFXFED)_i$ is the interaction term between (REFORM) and (PREFED).
$(REFXDEV)_i$ is the interaction term between (REFORM) and (PREDEV).
$(REFXRED)_i$ is the interaction term between (REFORM) and (PRERED).

As shown in Table 4, average fiscal effort for education in 1984 is well predicted by the index of pre-reform fiscal effort for education (PREFED). After pre-reform fiscal effort for education and some contextual factors are controlled for, state "activism" in education reform (REFORM) as of 1984 turns out to be marginally significant in predicting the state and local fiscal effort for education in the same year. Thus, state and local fiscal effort for education may have been increased as a result of state reform initiatives in early 1980s. However, the positive fiscal effect of state reforms seems to be attenuated by the state's pre-reform fiscal effort for education. It implies that mobilization of financial support was more difficult for the states which already had maintained relatively high fiscal effort before their reform legislation. Finally, the negative relationship between fiscal capacity and level

of resources allocated to public education turned out to be the case at the between-state (cross-sectional) level as well as the within-state (time-series) level.

The estimated developmental and redistributive tendencies of education expenditures during reform period are not significantly associated with corresponding fiscal patterns during pre-reform period. On the other hand, the effects of state education reform on state and local education expenditure patterns tend to vary among states with different racial compositions. The measure of reform activism (REFORM) interacts with the proportion of white population (PWHITE) to affect developmental and redistributive tendencies in education expenditures. For states with a relatively small minority population, the developmental tendency of state reform is likely to be positive while the redistributive tendency of state reform is negative. For example, if PWHITE=1, an active reform state (REFORM=1) would show developmental tendency (1.79) in education expenditures, but not redistributive tendency (-1.10).[13] However, if PWHITE=-1, the policy tendency of state reform, as inferred from expenditure patterns, would show the opposite results. Since most active states in the first wave of education reform are concentrated in the South where the percentage minority population is relatively high, the reform states and their localities were more likely to have taken redistributive direction in education expenditures. It requires in-depth case studies to further test the hypothesis that the political power of minority groups, as a contextual intervening factor, operates against the potentially biased policy tendency of state education reform towards development without redistribution.

Discussion

The three levels of government in the U. S. federal system maintain a different set of policy priorities because they operate under varying environmental constraints and resources. Faced with limited tax bases and taxpayers' threat of voting by foot, state and local governments are more likely to prefer developmental policies to redistributive policies than the federal government. On the one hand, state and local fiscal effort for categorical education services (e.g., compensatory education program) may

have declined during the last decade as a result of economic recession and federal deregulation. On the other hand, during the same period, state and local fiscal effort for general education services may have increased as a result of the statewide reform movement. Standards-raising education reforms towards educational excellence may not only lead to changes in the public's willingness to pay for education but also affect the allocation of educational resources. The outcome of interest in this study was the level of resources allocated to public education by state and local governments relative to their fiscal capacity. High level of fiscal effort for education, however, may be meaningless unless its distributive nature is identified. Increasing fiscal effort for education without serving developmental purposes may be treated as spending educational resources inefficiently. At the same time, increasing fiscal effort for education without considering redistributive effects would lead to inequitable distribution of educational benefits.

Building on the unitary model of state and local taxation and expenditure policies, this study attempted to explore how state and local political systems, taken as a whole, have reallocated educational resources to achieve their new policy goals in public education. It was presumed that state and local policy choices in education can be examined through a comparative analysis of their fiscal behaviors as measured by expenditure patterns over a significantly long time span. State and local fiscal effort for elementary and secondary education was related to that for highways and welfare, thus representing contrasting policy types. The aggregate 50 state data collected over 20 years were divided into two periods (1971-1981 and 1982-1990) to see how state and local governments have responded over time to a changing political climate and economic constraints. The results of separate OLS regressions for the two periods indicate that shifts in policy goals from equality of educational opportunity to academic excellence have led to corresponding changes in expenditure patterns from redistribution to development.

A multi-level statistical technique, HLM, was employed in this study to further examine interstate variation in expenditure patterns. While the growth trajectory of fiscal effort for education showed upward curvature, state reform itself appeared to have significant impact on the level of resources allocated to public education versus other social services. On the other hand, the distributive effects of state education reform turned out to depend on the

racial composition of states. Despite the exploratory nature of this study, the general structures of state-level distributive effects may be derived from the HLM model. Redistributive tendencies in education expenditures tend to be accompanied by a low level of fiscal effort for education. In addition, developmental versus redistributive tendencies in education expenditures tend to be highly conflicting. Thus, the policy challenge is to formulate education policies that promote developmental features without losing a redistributive focus. The current wave of school reform by the states might be seen as a move in that direction, since these reforms emphasize "high standards for all students." However, the reforms may be more successful in states where a high level of public support for education is mobilized across racial and social groups.

Footnotes

[1] Early studies estimated that revenues would need to increase by at least 20 % in order to pay for most of the proposed reforms (Odden, 1985). However, reform funds comprised only 2 % of cumulative (1983 to 1988) state revenue for education (Verstegen and McGuire, 1991).

[2] A convenient way of roughly calculating whether or not a policy is in the interest of the state or local government is to consider whether its benefit/tax ratio is more or less than 1.0, that is, whether the marginal benefits exceed the marginal cost to the average taxpayer (Peterson, 1981).

[3] A major concern was clearly to develop skilled workers and managers for a high-technology future (National Commission on Excellence in Education, 1983). During the first wave of state reform, however, few states adopted tests which measure higher-order skills or increased the number of technology courses as envisioned in *The Nation at Risk* (Ginsberg and Wimpelberg, 1987).

[4] Providing all children with collaborative school-linked services may serve to overcome resource scarcity and gain widespread political support. However, it is not clear how fiscal effort for education and social services will change as social services are linked to public education.

[5] Moreover, a direct investigation of educational benefits is complicated by the fact that education has both consumption and investment components (Cohn and Geske, 1990). In practice, modeling the investment aspect of education within the complete demand framework is almost impossible (see Kodde and Ritzen, 1984).

[6] It has been shown that such political factors as ethnicity, party competition, and voter turnout are more strongly related to welfare expenditures than other types of policy expenditures (Cnudde and McCrone, 1969; Sharkansky and Hofferbert, 1969; Tompkins, 1975). By contrast, developmental expenditures like highways are more likely to be affected by such economic factors as demand for the service and the cost of supplying services (Peterson, 1981).

[7] A traditional measure of fiscal effort for education is the ratio of state-level spending for education to state personal income. The tax effort in education is a good contrast to the absolute level of educational expenditures; some states

demonstrate high tax effort although they rank at the bottom in terms of direct expenditure per capita.

[8] Despite the critique in using the microeconomic concepts 'necessity' and 'luxury' on macrodata, they are used as technical definitions related to the magnitude of the income elasticity. The microeconomic approach to the demand for public services is often applied under the assumption that society's preferences for public services represent an aggregation of individual preferences.

[9] A spurt of state initiatives in domestic affairs characterized the conservative Republican period in the 1980s; Reagan's domestic policies, modernization of state governments, and the economic recovery from the 1981-82 recession contributed to this development.

[10] Murphy (1990) classified reform initiatives into three waves, and estimated the time period of the first wave as 1982-1985. In fact, however, the first wave of education reform, primarily comprised of centralized controls and standards, has survived throughout the 1980s. Year 1982 is also chosen as a turning point since declining fiscal effort for education started to stabilize or increase along with the first wave of education reform.

[11] It has been shown that the income elasticity of public education is quite low (Fabricant, 1952; Hirsh, 1961; Owen, 1972); micro-based estimates of the income elasticity turn out to be quite similar to those found in aggregate studies (Bergstrom, Rubinfeld, and Shapiro, 1982).

[12] BIGSTEPS, Rasch measurement program, is used to construct linear measures from the responses of 50 states to policies: the responses to each policy is dichotomized (yes/no). The sample reliability of policy (item) separation is .94, which indicates that policy (item) calibrations are sufficiently spread out to define distinct levels along the construct, "state activism in education reform."

[13] Since both variables, PWHITE and REFORM, are standardized to have a mean of 0 and standard deviation of .5, the values 1 vs. -1 represent a state in the top vs. bottom quartile of 50-state distribution.

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Table 1. Factor Analysis of State and Local Fiscal Effort for Major Public Services (1971-1990)

	Factor 1 (Development)	Factor 2 (Redistribution)
Highways	.847	-.252
Welfare	-.001	.782
Police	.355	.638
Lower Education	.905	.148
Other Education[1]	.776	-.189
	proportion of variance explained by each factor	
	.453	.228

Note. Two components are retained on the basis of the eigenvalues-greater-than-one rule.

[1] This category includes education-related expenditures other than elementary and secondary education, that is, higher education, assistance and subsidies, and other education.

Table 2. Estimated Fiscal Relations of Education to Highways and Welfare during Pre-reform Era (1971-1981) and State Reform Era (1982-1990)

	Standardized Regression Coefficients	
	1971-1981	1982-1990
Fiscal Effort for Highways	.18***	.27***
Fiscal Effort for Welfare	.34***	.10*
Fiscal Capacity	-.93***	-.10*
Federal Aid	.60***	-.12*
R^2	.87	.95

Note: Regression coefficients for year and state dummies are not reported.

* p<.05, ** p<.01, *** p<.001

Table 3. HLM Growth Model of State and Local Fiscal Effort for Education

Estimated Effects				
	Beta Coefficients	Standard Error	t-Statitstic	p-Value
Fiscal Effort for Education in 1984				
Mean	4.577	.161	28.495	.000
Growth Rate in 1984				
Mean	.039	.016	2.358	.027
Acceleration				
Mean	.010	.002	5.074	.000
Fiscal Capacity				
Mean	-.051	.017	-3.026	.006
Federal Aid				
Mean	-.627	.284	-2.211	.037
Developmental Tendency				
Mean	.226	.097	2.326	.029
Redistributive Tendency				
Mean	.201	.079	2.552	.018

The Chi-Square Table				
Parameter	Estimated Variance	Degrees of Freedom	Chi-Square	p-Value
Fiscal effort for education	1.219	49	11992.71	.000
Developmental tendency	.243	49	173.99	.000
Redistributive tendency	.079	49	89.80	.001

Correlations among State-level Random Effects		
	Fiscal effort for education	Developmental tendency
Developmental tendency	.457	
Redistributive tendency	-.767	-.906

Reliability of State-level Random Effects
Fiscal effort for education = .996
Developmental tendency = .461
Redistributive tendency = .281

Table 4. Final HLM Model of the Distributive Effects of State Education Reform

	Estimated Effects			
	Beta Coefficients	Standard Error	t-Statitstic	p-Value
Fiscal Effort for Education in 1984				
BASE	4.594	.071	64.619	.000
PREFED	.931	.083	11.253	.000
AVINC	-.146	.031	-4.641	.000
PWHITE	.135	.136	.991	.240
REFORM	1.440	.721	1.997	.057
REFXFED	-.312	.144	-2.165	.042
Growth Rate in 1984				
MEAN	.031	.017	1.832	.076
Acceleration				
MEAN	.010	.002	4.775	.000
Fiscal Capacity				
MEAN	-.043	.018	-2.423	.025
Federal Aid				
MEAN	-.858	.298	-2.879	.009
Developmental Tendency				
BASE	.267	.090	2.972	.007
PREDEV	.100	.134	.744	.298
PWHITE	-.020	.213	-.096	.394
REFORM	.115	.240	.479	.351
REFXPWH	1.699	.518	3.283	.003
Redistributive Tendency				
BASE	.212	.088	2.395	.026
PRERED	-.103	.072	-1.426	.143
PWHITE	-.070	.194	-.358	.370
REFORM	-.085	.197	-.430	.360
REFXPWH	-.946	.495	-1.911	.067

The Chi-Square Table

Parameter	Estimated Variance	Degrees of Freedom	Chi-Square	p-Value

Fiscal effort for education	.176	44	1617.98	.000
Developmental tendency	.181	45	125.47	.000
Redistributive tendency	.106	45	69.94	.010

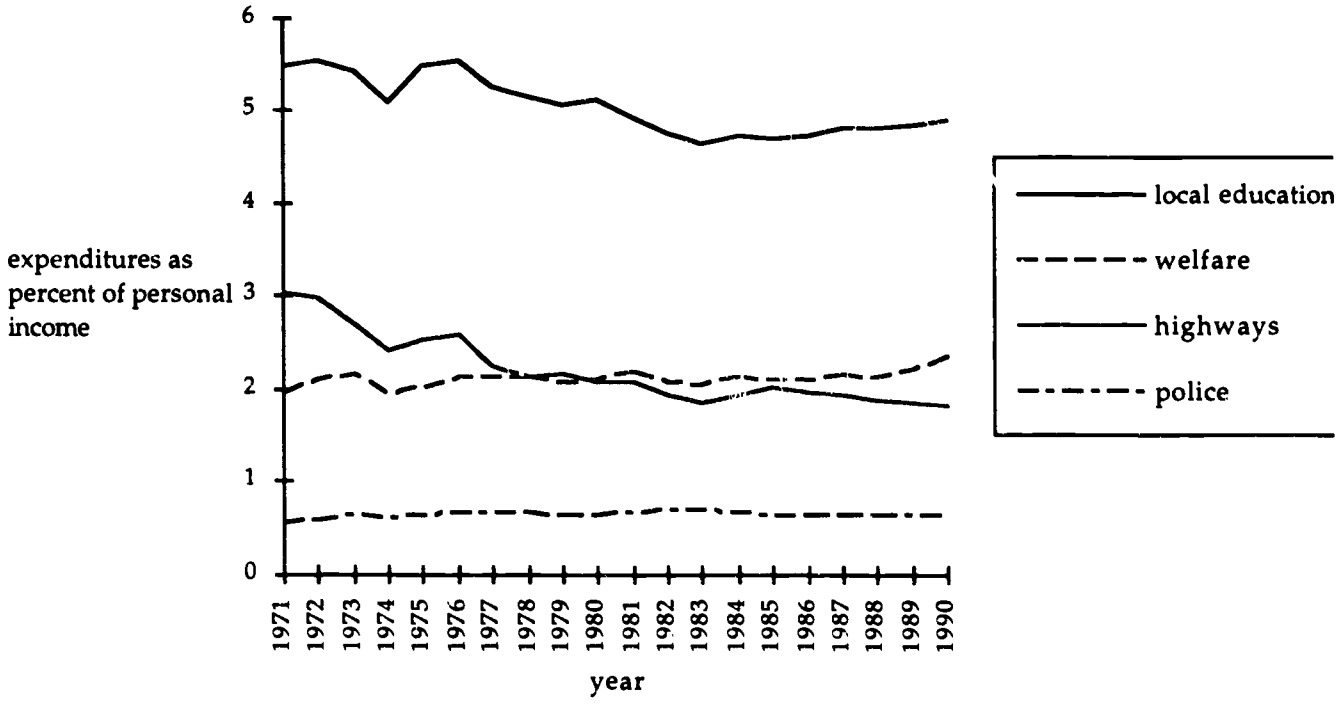
(Table 4 Continued)

Table 5. Measurement Instrument: State Activism in Education Reform

Student Standards Policies	
Uses of State Test Results	Monitoring Remediation Gatekeeping Funds Distribution
High School Graduation Requirements	Credit Requirements Exit Test
School Attendance	
Teacher Standards Policies	
Entrance into Teacher Education	Test GPA Other
Teacher Education Curriculum	Approved Program Distribution Requirements
Completion of Teacher Education	GPA Basic Skills Test Professional Skills Test Subject Specialty Test
Entry-level Certification	Basic Skills Test Professional Skills Test Subject Specialty Test General Knowledge Test Evaluation of Beginning Teaching Approved Program
Recertification Requirements	Years of Teaching Experience Additional Formal Education In-service Training
Staff Development Program	

Note: The data is reconstructed from the 1984-85 survey initiated by ETS (Goertz, Ekstrom, and Coley, 1984; Goertz, 1986). They include the types of policies in effect in the year of the survey (or legislated by that year but due to become effective after that date).

Figure 1. State and Local Fiscal Effort for Public Services (1971-1990)



Sources: U.S. Bureau of the Census, U.S. Census of Governments, Government Finances in 1970-1971 through 1989-1990. U.S. Bureau of the Census, Statistical Abstract of the United States, 1970-1971 through 1989-1990.