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Expanding Nonresidential Property Tax Bases for School Finance in New York State: Implications for Student Equity

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This study examines the efficacy of nonresidential expanded tax base approaches (ETB) to school finance. In general, nonresidential ETB approaches permit districts to maintain taxing authority over their residential property, while removing nonresidential property from the local tax base. The pool of nonresidential property is instead taxed at the state or regional level, with the proceeds distributed back to local districts in some equalizing manner. The study includes a simulation that estimates the effects of statewide and regional nonresidential ETB approaches on measures of student equity for New York school districts in 1990-1991. Findings suggest that expanded tax base approaches are promising and need not have adverse effects on urban areas. In particular, the study's findings suggest that (a) nonresidential ETB approaches improve measures of student equity at no additional cost to the state (i.e., state aid), (b) that regional in contrast to statewide ETB approaches work to the advantage of urban areas in the state, and (c) the manner in which pooled nonresidential property tax revenues are distributed to local districts is a critical determinant of the policy's ability to improve measures of equity.

Overview

The importance of an educated workforce to the economic welfare of a community is well understood. Communities with an adequately educated workforce are attractive to emerging industries, and well-educated children are able to compete for skill-oriented jobs (Reeder, 1995). Notwithstanding this awareness, many communities lack the resources necessary to support educational initiatives that would improve their schools. For example, the loss of industry to foreign competitors and the accompanying loss of business property from the local tax base has forced many rural schools to reduce their investments in education (U.S. Department of Education, 1994). This phenomenon is particularly vexing for school systems that rely heavily on local revenues for support (Monk & Brent, 1997).

This study examines nonresidential expanded tax base (ETB) approaches to school finance, a funding alternative that attempts to address the needs of rural and other school systems that find it difficult to secure adequate resources from extant property tax bases. In general, nonresidential ETB approaches permit districts to maintain taxing authority over their residential property, while removing nonresidential property from the local tax base. The pool of nonresidential property is instead taxed at the state or regional level, with the proceeds distributed back to local districts in some equalizing manner. The intent of this approach is to create a financing system that continues to utilize the local property tax, thereby preserving a degree of local fiscal control while providing for a more equitable distribution of the region's nonresidential property wealth.

Currently, no state uses nonresidential ETB approaches to school finance. To examine the efficacy of the finance policy, this study simulates the effect of statewide and regional nonresidential ETB approaches on student equity measures for New York school districts using 1990-1991 data. The five remaining sections report the results of this effort. I begin by providing the rationale for examining the efficacy of nonresidential ETB approaches, giving particular attention to New York's school finance system. In the second section, I review the literature on nonresidential ETB approaches. The third section presents the conceptual framework that guides this inquiry, and the fourth section reports a series of simulations undertaken to determine the effect of nonresidential ETB approaches on student equity in New York. Finally, I discuss the policy implications of adopting nonresidential ETB approaches to school finance.

Rationale

There is an increasing awareness of a need to make fundamental changes in how revenues are raised for education. In the last decade, more than half the states in this country have been involved in litigation addressing the financing of education, many of which reviewed the use of the real property tax (Swanson & King, 1997). In addition, several states have adopted far-reaching reforms that decrease substantially districts' reliance on local property taxes for school support (Firestone, Goertz, & Natriello,

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1997). In 1993, for example, the Michigan legislature reduced by one half the share of school spending financed by the property tax (Kearney, 1995).

Despite these efforts, many states still rely heavily on the local property tax to support schools. In fact, 19 states secure more than 50% of total school revenues from their own sources (Monk & Brent, 1997). New York, for example, raises 55% of total school revenues from the local property tax (Brent & Monk, in press). Moreover, although New York's basic aid formula provides additional aid to less wealthy districts, this equalizing aid covers only a fraction of total expenditures, leaving poorer districts at a disadvantage in their ability to supplement state aid with local revenues. As a consequence, New York's poorer districts levy higher property tax rates and spend less per pupil than their wealthier counterparts (U.S. Department of Education, 1995).

The present study begins with the assumption that many states will continue to rely heavily on the local property tax to finance schools. Whether states should continue to do so raises a broader set of issues that extend beyond the scope of my analysis. Instead, I examine nonresidential ETB approaches to school finance, a policy alternative that promises to enhance interdistrict spending equity by altering the mix of local support for education.

There are two forms of ETB approaches: comprehensive and nonresidential. Comprehensive ETB approaches tax residential and nonresidential property at the state or regional level, and distribute the revenues back to local districts in some equalizing manner. Nonresidential ETB approaches permit local districts to maintain taxing authority over their residential property, and tax only nonresidential property at the state or regional level.

This study examines only nonresidential ETB approaches to school finance. Among the factors that contributed to this decision were certain features of nonresidential ETB approaches that make them more politically acceptable than their comprehensive counterparts. For example, comprehensive ETB approaches move the primary funding source from the local to the state or regional level. One understandable concern is that the increase in state or regional presence will foster greater regulation of school policies (Kearney, 1995; Killian, 1984; Kirst, 1984).

In addition, nonresidential ETB approaches offer school districts a degree of local fiscal control by maintaining taxing authority over their residential property. The theory behind vesting communities with local fiscal control is that they will be more responsive to educational needs if given the means to express their support. For example, residential taxpayers may recognize the social desirability of securing resources for their own schools, but may be resistant to residential property taxes collected and distributed to schools outside their district.[1]

Review of the Literature

Ladd (1975) conducted the seminal study of nonresidential ETB approaches to school finance. He examined whether statewide taxation of commercial and industrial property would improve measures of student equity for communities in the Boston standard metropolitan statistical area (SMSA). Ladd developed two separate grant formulae to distribute pooled nonresidential property tax revenues back to local districts. The first formula distributed pooled revenues to districts as flat grants. The second formula distributed pooled revenues to districts inversely with residential property wealth per pupil.

Ladd's simulations produced several interesting results. In the case of the flat grant per pupil, the range of expenditures among districts increased. In addition, the negative correlation between expenditures and the fraction of families in poverty increased. The second distribution formula fared only slightly better. For example, the positive correlations between expenditures and residential wealth and between expenditures and income decreased. However, the range of expenditures among districts, and the negative correlation between expenditures and the fraction of families in poverty, increased. These findings prompted Ladd to conclude that nonresidential ETB approaches would have adverse distributional effects on the pattern of expenditures among districts in the Boston SMSA.

The analytical framework developed by Ladd (1975) serves as the standard for nonresidential ETB approach studies. Most notably, Ladd recognized the need to develop a behavioral model that predicted how districts would respond to changes in their local tax base. In particular, Ladd sought insight into how the policy change would alter district spending. In addition, Ladd demonstrated that the effect of the policy change was dependent on the particular distribution formula employed.

Although Ladd (1975) provides guidance when modeling the effects of nonresidential ETB approaches on student equity, the findings need to be interpreted carefully. Ladd examined districts located in the Boston SMSA only. Because variations in the mix of nonresidential/residential property is more pronounced in rural and suburban areas, limiting the simulations to the Boston SMSA could lead to erroneous conclusions about a statewide policy.[2]

Stark (1992) also simulated the effects of statewide nonresidential ETB approaches to school finance. Using data from 119 of 296 Indiana school districts, Stark concluded that statewide taxation of nonresidential property

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[1]Evidence of this type of behavioral response was provided by Texas's recent experience with comprehensive regional school taxing units (Casey, 1996). See also Picus (1991).

[2]See Center for the Study of States, 1995.

stimulated greater spending equity among districts. Stark, however, did not account for how the policy change would alter district spending. Instead, Stark assumed that districts would work to sustain their current revenue levels and take advantage of pooled revenues when available. While this might occur in the short term because districts are bound to current expenditures, it is unlikely that districts would maintain spending levels in the long term. Absent a predicted behavioral response to the policy change, Stark's analysis makes it is difficult to assess the effect of the proposal on student equity.

In 1995, Ladd and Harris (1995) re-examined the efficacy of statewide nonresidential ETB approaches by simulating the effects of the policy change on New York school districts. Using data for 1990-1991, the authors simulated several ways to distribute pooled nonresidential property tax revenues back to local districts. Under the more equalizing formulae, interdistrict variations in spending decreased and student equity improved. However, Ladd and Harris were quick to point out that New York City (NYC) lost a significant amount of revenue, while rural and suburban districts gained revenue. The authors noted that the decrease in spending in NYC would be a highly undesirable outcome of the policy change. Per pupil spending in NYC was well below the statewide average, despite the fact that almost 40% of its students were in poverty.

Ladd and Harris' use of all districts within a state when simulating the effect of statewide nonresidential ETB approaches addressed an important limitation of studies in this area. However, it would be incorrect to conclude that Ladd and Harris demonstrated conclusively the effect of statewide nonresidential approaches on measures of student equity. In all simulations, the authors assumed no change in the distribution of state aid. Because New York looked to both income and property wealth to allocate aid, a policy change that altered these variables necessarily altered the distribution of state aid. Absent adjustments for these changes, the effect of statewide nonresidential ETB approaches on student equity remains unclear.

The limited number and sometimes contradictory studies that examined nonresidential ETB approaches suggest that there is much to be learned about the efficacy of this reform strategy. Moreover, there can be little doubt that the findings of Ladd (1975) and Ladd and Harris (1995) abate policymakers' enthusiasm for the policy change. A school finance system that drives resources from urban to suburban and rural districts is not only politically troublesome, but also counterproductive to equity objectives if urban areas are consistently found to be relatively poor.

Before we draw conclusions about the efficacy of nonresidential ETB approaches, it is important that earlier studies be improved on. In this study, I use the same data as Ladd and Harris (1995) but adopt a substantially different methodology. First, I simulate the effects of taxing nonresidential property for public schools using a more comprehensive behavioral response model that incorporates the impact of the proposal on the distribution of state aid. Second, I simulate the effects of both statewide and regional variations of this reform strategy. Ladd and Harris (1995) demonstrated that the policy change worked differently in dissimilar types of districts (e.g., urban, suburban, and rural). It is possible that nonresidential ETB approaches of smaller scales will influence measures of student equity differently than statewide approaches. Presently, no study explores the effects of regional nonresidential ETB proposals on measures of student equity.

Conceptual Framework

Three factors influenced the results of this study and the conclusions drawn about the efficacy of nonresidential ETB approaches. First, how was equity defined and measured? Second, how were districts predicted to alter their spending in response to the policy change? Third, how were pooled nonresidential property tax revenues distributed back to local districts? The following discussion addresses these issues.

Equity

This study defined student equity in terms of a fiscal input object: weighted per pupil expenditures.[3] Several factors contributed to the selection of weighted per pupil expenditures as the student equity object. First, the use of student weights allowed each district's pupil count to be reformulated to arrive at a figure that accounted for differences in the cost to educate different classes of pupils. Second, weighted per pupil expenditures permitted the analysis to move forward by capturing variations in districts' ability to purchase schooling resources, while not entering the debate of how those resources should be used.

The following statistics were used to assess whether nonresidential ETB approaches decreased the dispersion of expenditures among districts: range, coefficient of variation, and the McLoone index. The range is a popular measure of inequality that provided a first approximation of whether nonresidential ETB approaches decreased variations in spending across districts. In fact, the range is the statistic that most often draws public attention to district spending inequities. In contrast to the range, which focused on districts at the extremes of the distribution, the coeffi-

[3]New York state's basic operating aid formulae defined the student weighting procedure used in this study. For example, using "regular" pupils as a baseline (1.00), pupils with special needs were allocated additional weighting factors (i.e., pupils with special educational needs = 1.25, pupils in secondary school = 1.25, and pupils in half-day kindergarten = .50).

cient of variation considered differences in spending among all districts in the unit of analysis, becoming smaller as equity increased.

The McLoone index is the ratio of expenditures for students below the median to the expenditures that would be required if all students below the median were receiving the same expenditure level of the median student (Berne & Stiefel, 1984). The index varies between zero and one, approaching one as equity increases. By focusing the equity analysis on those students in the lower half of the distribution, the McLoone index highlighted the fiscal condition of poorer districts.

In addition, dispersion statistics—statistics that measured the policy's influence on equal opportunity—were used. Equal opportunity is a negative standard that requires that the equity object be unrelated to certain "illegitimate" district characteristics (Strike, 1988). For example, district spending (equity object) should not be related to district property wealth (illegitimate characteristic). A rough consensus has emerged among policymakers as to the following set of illegitimate characteristics: residential property wealth, household income, and incidence of poverty (Berne & Stiefel, 1984). Correlation coefficients were used to measure the relationship between weighted per pupil expenditures and these variables, with zero coefficients indicating perfect equal opportunity.

Predicted District Spending

The nonresidential ETB approaches examined in this study allowed districts to supplement revenues secured from pooled nonresidential property taxes and state aid with a local tax at any level to support expenditures. Districts that experienced net nonresidential property tax inflows could increase spending or provide tax relief; districts that experienced net nonresidential property tax outflows could decrease spending or increase residential property taxes. The following model was used to predict how districts would alter their spending in response to the policy change:

$$E_i = a_1 Y_i + a_2 RW_i + a_3 TP_i + a_4 BLOCAID_i + a_5 FED_i + a_6 AGE_i + \varepsilon$$

where

E = education expenditures per weighted pupil in the *i*th school district

Y = median household income in the *i*th school district

RW = equalized full value of residential property per weighted pupil in the *i*th district

TP = the tax price of education services in the *i*th school district

BLOCAID = state and local aid per weighted pupil (nonmatching) in the *i*th district

FED = federal grants per weighted pupil (nonmatching) in the *i*th district

AGE = fraction of the population above the age of 64 in the *i*th district

ε = error term with the usual characteristics

and a_1, a_2, a_3, a_4, a_5, and a_6 were coefficients to be estimated.

The following discussion describes further each variable's specification.

Expenditures. Expenditures per weighted pupil served as a proxy for a district's demand for educational services.

Income and residential property wealth. Current income (Y) and residential property wealth (RW) were used to account for the fact that the demand for education was likely a function of the district's income and housing wealth. It is important to note that residential property wealth, not total property wealth, was the correct proxy. Nonresidential property had a price effect on the demand for educational services.

Nonmatching aid. Local, state, and federal categorical and block grants also increased the ability of districts to purchase education services. The feature that distinguished BLOCAID and FED from matching aid was that the size of the grant was independent of local effort.

Tax price. The tax price (TP) of public education services was a product of the share that was locally financed (LS) and the fraction of this share that was born by local residents (RTB). This relationship is expressed as follows (see Brazer & McCarty, 1989; Ladd, 1975; Lawton, 1985; Richard, 1996):

$$TP = (LS)(RTB)$$

where

LS = the fraction of an additional dollar of public education services financed from local sources due to matching aid. The local share (LS) equaled ($1 - m_i$) where m was the state matching rate of the *i*th district.

RTB = the full value equalized residential fraction of the district property tax base.

From the point of view of district residents, the local share (LS) represented the fraction of the cost of an additional dollar of education services that was financed from local sources. It was through LS that matching aid entered the expenditure equation. For example, a matching rate of 1.00 indicated that for every dollar raised by the local district, they would receive $1 of matching aid. The effect on residents of receiving a matching grant was that it lowered the price of education services.

The residential fraction of the tax base (RTB) was the proportion of locally raised revenues that was borne by the district. It was here that the nonresidential portion of the district tax base exerted its influence on per pupil expenditures. For example, one would expect districts with higher proportions of nonresidential property to demand larger quantities of education services, all else being equal.

Preferences. There are many variables that have been specified to predict a districts preference for education services, and one was selected for use in this study: the percentage of a district's population above the age of 64. Because voters over the age of 64 were unlikely to have school-aged children, it was presumed that they would prefer lower expenditures per pupil to higher (Brazer & McCarty, 1989; Megdal, 1984).

Many empirical models could have been specified to predict districts' response to the policy change. The variables selected for use in this study were well supported in the literature as explaining variations in expenditures for education (see, for example, Billings & Folsom, 1980; Downes & Pogue, 1992; Ladd, 1975; Lawton, 1985; Mathis & Zech, 1986; Megdal, 1984; and Turnbull, 1987).

Distribution Formulae

Whether nonresidential ETB approaches enhanced equity was dependent on how pooled nonresidential property tax revenues were distributed to local districts. A regional nonresidential ETB approach that failed to promote equity through one distribution mechanism could be found to do so with the use of another. Therefore, it was important to consider possible variations in how pooled nonresidential property tax revenues were allocated. Four distribution formulae were selected for use in this study:

Plan 1 (flat grant per pupil). $$G1_i = \frac{PUB_i}{\sum_{j=1}^{i}(PUB_i)}$$

where PUB is public school pupils, i is the ith district, and G1 is the share of the total grant going to district i.

Plan 2. $$G2_i = \frac{PUB_i/RW_i}{\sum_{j=1}^{i}(PUB_i/RW_i)}$$

where PUB is public school pupils, i is the ith district, RW is residential property wealth per weighted pupil, and G2 is the share of the total grant going to district i.

Plan 3. $$G3_i = \frac{PUB_i/INC_i}{\sum_{j=1}^{i}(PUB_i/INC_i)}$$

where PUB is public school pupils, i is the ith district, INC is the income wealth per weighted pupil, and G3 is the share of the total grant going to district i.

Plan 4. $$G4_i = \frac{PUB_i/TW_i}{\sum_{j=1}^{i}(PUB_i/TW_i)}$$

where PUB is public school pupils, i is the ith district, TW is total wealth (income and residential property wealth) per weighted pupil, and G4 is the share of the total grant going to district i.

The distribution formulae selected for this analysis represent only a few of the many mechanisms that could be devised to distribute pooled nonresidential property tax revenues back to local districts. The list was not intended to be exhaustive. Distribution plans 1 through 3 are similar to those used by Ladd and Harris (1995), facilitating comparisons between the studies. The fourth distribution formula allocated pooled nonresidential property revenues similar to New York's basic operating aid formula. Together, the set identifies distribution formulae that capture various measures of districts' fiscal capacity to support education services.

Simulations and Findings

The simulations progressed in several stages. First, using ordinary least squares regression, I estimated a statistical model that explained variations in weighted per pupil expenditures across districts in New York State in 1990-1991 (see Table 1). Of the 665 regular K-12 school districts (employing 8 or more teachers and eligible for regular state funding), 642 served as individual cases. I eliminated 23 districts due to inconsistent or missing data.

The fit of the regression equation was good, as evidenced by the R^2 statistic. Indeed, roughly three quarters of the variation among districts in education expenditures is

Table 1
Behavioral Response Model

E =	.077352 Y	+	.004257 RW	-	1746 TP	+	.87954 BLOCAID	+	1.7919 FED	-	7586 AGE	+ 5203
	(13.901)		(19.479)		(3.758)		(14.500)		(4.103)		(7.658)	(13.667)

R^2 = .756

Note. The absolute value of the respective *t* ratio appears in parenthesis.
Data Sources: New York State Education Department, *School Financial Master File of the Basic Education Data System* (BEDS) 1990-1991; State Division of Equalization and Assessment, *Report of Effective Full Value and Tax Levy by Property Class for the 1991 Assessment Roll* (E & A); National Center for Education Statistics, U.S. Department Of Education, *School District Data Book* 1994 (Census).

explained by the linear combination of the six independent variables. In addition, the coefficients had the expected signs and were within ranges reported by earlier studies (e.g., Brazer & McCarty, 1989; Gurwitz, 1982, Ladd, 1975; Ladd & Harris, 1995; Megdal, 1984; and Richard, 1996).

During the second stage of the simulation, I used the behavioral response model to predict the level of spending in each district after the implementation of a nonresidential ETB approach. This stage required several steps. First, nonresidential property was removed from the local tax base. The result of this step was to increase RTB (residential fraction of the tax base) to 100% for all districts. Next, because the removal of nonresidential property from the local tax base altered the distribution of basic operating aid under New York State law, the amount of state operating aid distributed was adjusted to reflect this change.

Basic operating aid, New York's largest aid category, was distributed to districts in an inverse relation to their ability to pay. Ability to pay was measured by a district's Combined Wealth Ratio (CWR), which equaled the sum of two ratios:

1. 50% selected full value (equalized assessed value of taxable real property) per total wealth pupil units (TWPU), divided by the state average;

2. 50% of the adjusted gross personal income of resident taxpayers per TWPU, divided by the state average. The CWR was then used to calculate the state sharing ratio (matching rate) for a given district: state sharing ratio = 1 - (.64 x CWR).

In order to predict the full effect of the policy change, the CWR for each district was recalculated. For the statewide nonresidential ETB simulations, the full value term of the CWR (#1 above) was redefined as follows: 50% selected full value (equalized assessed value of residential property per TWPU for the district), divided by the state average residential property value. Restating the CWR in this manner reflected that districts retained taxing authority over their residential property tax base only. Regional approaches, however, granted districts access to a portion of the nonresidential property tax base of the region.[4] Accordingly, the full value term for regional nonresidential ETB approaches was specified as follows: 50% selected full value (equalized assessed value of residential property per TWPU for the district plus the average equalized assessed value of nonresidential property per TWPU for the BOCES region), divided by the state average.

The income term of the CWR (#2 above) was unchanged for both the statewide and regional simulations. In addition, recalculating district CWRs did not alter the amount of basic operating aid that was distributed. Holding total basic operating aid constant was important because changes in the equity measures were likely to be the result of the policy approach, not an artifact of changes in the distribution of BOA.

The restated sharing ratios entered the regression equation through the local share (LS) term of the tax price (TP). For those wealthier districts with an effective matching rate of zero, aid entered the expenditure equation as nonmatching state block grants for education (BLOCAID).

During the simulations final stage, nonresidential property was taxed at the level required by each ETB approach. The statewide simulations used the weighted average nonresidential property tax rate for New York State in 1990-1991. The regional simulations used the weighted average nonresidential property tax rate for each BOCES region in 1990-1991. Next, pooled nonresidential property tax revenues were distributed to local districts using each of the

[4]Boards of Cooperative Educational Services (BOCES) are voluntary, cooperative associations of school districts in a geographic area that have banded together to provide educational or business services. For purposes of this study, districts are grouped into "regions" according to BOCES boundaries. In 1990-1991, there were 41 BOCES regions in New York State.

Table 2
Student Equity: New York State K-12 School Districts (Excluding New York City), 1990-1991

Approach	Distribution Formula[a]	Dispersion Measures: Range	Dispersion Measures: Coefficient of Variation	Dispersion Measures: McLoone Index	Equal Opportunity Measures (Correlation Coefficient): Income Wealth	Equal Opportunity Measures (Correlation Coefficient): Residential	Equal Opportunity Measures (Correlation Coefficient): Poverty
Actual		$16,399	.2384	.87	.69	.76	-.30
Statewide	Plan 1	$16,058	.1607	.93	.72	.80	-.24
	Plan 2	$14,645	.1283	.93	.28	.45	.19
	Plan 3	$14,546	.1256	.93	.50	.63	-.04
	Plan 4	$14,522	.1234	.94	.37	.52	.10
Regional	Plan 1	$17,851	.2034	.87	.73	.82	-.28
	Plan 2	$15,338	.1997	.89	.62	.66	-.15
	Plan 3	$16,544	.1983	.89	.67	.74	-.22
	Plan 4	$15,428	.1977	.89	.64	.68	-.18

[a]Plan 1 = flat grant per weighted pupil
Plan 2 = inverse residential wealth per weighted pupil
Plan 3 = inverse total wealth per weighted pupil
Plan 4 = inverse income per weighted pupil

four distribution formulae. The revenues were treated as block grants for education and entered the behavioral response model through the BLOCAID term. It should be noted that the policy change redistributed nonresidential property tax revenues based on actual amounts collected in 1990-1991. That is, no additional nonresidential tax revenues were generated and entered into the system.

Student Equity

Table 2 reports the simulated effects of statewide and regional nonresidential ETB approaches on student equity measures for New York school districts in 1990-1991. The New York City (NYC) district is excluded from the table because its large student enrollment would drive the results.[5] In addition, NYC is a single region (BOCES) and would be unaffected by regional approaches. The impact of nonresidential ETB approaches on the NYC district is discussed shortly.

The first row in Table 2, actual student equity measures for 1990-1991, is the baseline to which the simulations should be compared. For example, the range and coefficient of variation both point to large disparities in the resource levels available to students across the state. Similarly, the McLoone index (.89), which focuses on the resources available to students below the median, suggests that substantial amounts of resources were required to raise the spending levels of students below the mid-point to the median expenditure level.

Table 2 also reports the correlations between actual district expenditures and income, residential wealth, and percentage of students in poverty. The equal opportunity measures point to a strong, positive relationship between spending and district wealth characteristics. This finding indicates that higher spending was closely associated with increasing levels of income and residential property wealth. In contrast, the negative correlation between spending and poverty indicates that higher levels of spending were associated with lower levels of poverty.

Turning to the simulation results, Table 2 reveals that most statewide and regional plans improved the measures of student equity. For example, with the exception of Plan 1, statewide approaches decreased the dispersion of spending levels across districts and improved equal opportunity. In other words, higher levels of district spending were now less likely to be associated with higher levels of wealth (i.e., income and residential property) and poverty. Distribution Plans 2 and 4 produced similar results in the regional simulations. These finding suggest that nonresidential ETB approaches could improve student equity

[5]NYC enrolled approximately one third of New York's public school students in 1990-1991 (University of the State of New York, 1993).

Table 3
Change in External Revenue (per weighted pupil) by Community Type, 1990-1991

Approach	Distribution Formula[a]	New York City	Big 4 Cities[b]	Downstate Small Cities	Downstate Suburbs	Upstate Small Cities	Upstate Suburbs	Rural
Statewide	Plan 1	-$143	$528	- $995	-$386	$347	$312	$503
	Plan 2	-$255	$1287	-$1623	-$1141	$940	$404	$1604
	Plan 3	-$382	$767	-$1617	-$708	$524	$517	$1586
	Plan 4	-$281	$1075	-$1617	-$1016	$772	$456	$1593
Regional	Plan 1	-	$205	-$290	-$115	-$148	-$71	$21
	Plan 2	-	$559	$619	-$167	-$90	-$188	$47
	Plan 3	-	$421	-$145	-$117	-$264	-$13	$139
	Plan 4	-	$511	$359	-$152	-$171	-$151	$68

[a]Plan 1 = flat grant per weighted pupil
Plan 2 = inverse residential wealth per weighted pupil
Plan 3 = inverse total wealth per weighted pupil
Plan 4 = inverse income per weighted pupil
[b]Rochester, Buffalo, Yonkers, and Syracuse

within New York. The figures in Table 2 also indicate that statewide approaches were more successful at enhancing student equity than regional approaches. This finding is in keeping with the notion that larger tax bases produce a more equitable distribution of a state's nonresidential property wealth.

Student Equity Within Regions

Greater understanding of the efficacy of nonresidential ETB approaches can be gleaned from examining the influence of the policy change on student equity within BOCES regions. For example, the regional approach produced improvements in all student equity measures under one or more of the distribution plans in 15 BOCES regions. This is no small feat and should be recognized as such. Comparable results occurred in only five regions under the statewide approach. If the standard is relaxed, regional plans produced improvements in four or more equity statistics in 37 BOCES. Statewide plans produced similar results in only 25 BOCES. These findings suggest that both statewide and regional approaches were successful in improving student equity in the majority of BOCES. However, when the unit of analysis was shifted from the state to the regional level, regional approaches were far more successful in improving student equity.

Analysis of nonresidential ETB approaches at the regional level also provided additional insight into the efficacy of the various distribution formulae. For example, Plans 2 and 4 produced the most equitable results in the majority of BOCES regions under both approaches. However, there were BOCES regions where either Plan 1 or 3 produced the greatest improvements in equity. This finding was of particular relevance for regional approaches. States that implement regional nonresidential ETB approaches could allow individual regions to select (or perhaps specify) the most effective distribution mechanism. The broad-based nature of statewide approaches would not permit such discretion.

Revenue Flows

Nonresidential ETB approaches produced a new distribution of resources that could only be achieved by taking nonresidential property tax revenues from some districts and giving it to others. It follows that implementation of the policy change yielded a set of "winners" and a set of "losers." Table 3 offers insight into the types of districts that fell into these groups.[6]

[6]The figures reported in Table 3 represent the difference between (a) nonresidential property tax revenues gained through pooled distributions and (b) revenues lost from removal of nonresidential property from the local tax base, including adjustments to basic operating aid. Positive figures represent net inflows of nonresidential property tax revenues.

Focusing first on the statewide simulations, Table 3 demonstrates that New York City, downstate small cities, and downstate suburbs were net losers under the policy approach. In other words, on average, these districts did not receive enough pooled revenues to offset the revenues lost from not taxing nonresidential property at the local level. On the other hand, districts in the Big 4 Cities, upstate small cities, upstate suburbs, and rural areas were net gainers of external revenue. To put it simply, statewide nonresidential ETB approaches drove nonresidential property tax revenues from downstate to upstate districts.[7]

The revenue flows reported in Table 3 suggest that upstate districts would embrace statewide nonresidential ETB approaches. It is unlikely, however, that state-level policymakers would favor a school finance reform that decreases the spending ability of NYC. Per pupil expenditures in NYC are consistently below the statewide average despite the fact that almost 40% of its students are in poverty. Furthermore, because of the lower cost of providing education services in upstate districts, the revenue shifts predicted in Table 3 would likely have a larger impact on spending than the absolute dollar figure suggest. The state could remedy this concern by constructing distribution formulae that account for price-level differences across districts. However, the absence of such indices in New York's existing aid formulae point to the state's reluctance to do so.

Implicit in their design, regional nonresidential ETB approaches did not produce the large intrastate revenue flows that occurred with statewide approaches. Instead, Table 3 suggests that pooled, nonresidential property tax revenues flowed from downstate suburban districts to downstate small city and Big 4 districts (i.e., Yonkers) and from upstate small city and upstate suburban districts to rural and Big 4 city districts (i.e., Buffalo, Rochester, and Syracuse). As noted above, NYC is a single region and would be unaffected by the policy change.

From a policy perspective, the regional approach's inability to address equity issues in the NYC school district prompts concern. Policymakers, however, could address this issue in a number of ways. For example, the NYC district could be included in one or more of the neighboring BOCES (i.e., Westchester and Nassau).[8] Alternatively, because regional approaches improved equity among districts at no additional cost to the state (i.e., state aid did not increase), state-level policymakers could consider these gains in equity and give NYC special treatment in future aid allocations.

Limitations

District spending decisions are the outcome of a complex political process that includes legislators, district officials, and taxpayers. To predict district spending after implementation of nonresidential ETB approaches, this study estimated a response model. The following limitations of these models are acknowledged.

First, response models do not consider future adjustments to school finance reforms. Households that chose to live in districts that were relatively well off under the old system may now choose to live elsewhere. As demands for locations change, the coefficients estimated to predict district spending will also change. Second, it is impractical to assume that districts could instantaneously adjust spending in response to nonresidential ETB approaches. District spending might depend on agreements that were reached several years earlier, such as labor contracts and debt service. In addition, spending decisions might be based on factors that are exogenous to the decisions of district officials (e.g., regulatory constraints).

Despite these limitations, studies report that response models reasonably predict district spending. Response models also provide an indication of the initial impact of the reform, before behavioral adjustments have worked themselves out. There is no doubt that it is risky to predict what might happen as a result of school finance reforms based on models of pre-reform behavior. The risk is remedied somewhat by the application of appropriate techniques to the available data as was done in this study.

Summary

Results from this study inform school finance policy debates by providing insight into the efficacy of nonresidential ETB approaches in general, and the appropriate level of tax base expansion in particular. For example, the simulations predict that both statewide and regional nonresidential ETB approaches would improve student equity among New York's school districts. In fact, both approaches offered a degree of spending equalization among districts without increasing state aid. This is a salient finding for

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[7]Ladd and Harris (1995) predicted the same set of "winners" and "losers" in their analysis of statewide nonresidential ETB approaches. The revenue shifts predicted above, however, were smaller in magnitude than those reported by Ladd and Harris. For example, utilizing distribution Plan 2, Ladd and Harris reported that rural districts received a net revenue inflow of $3,113. Similarly, Ladd and Harris reported that NYC experienced a net revenue outflow of $849. Recognizing that the distribution formulae are the same, the disparities in revenue shifts between the two studies can be attributed to specification of the models used to predict spending. In particular, Ladd and Harris did not account for the policy change's influence on state aid. In this analysis, shifts in nonresidential property tax flows were partially offset by adjustments to BOA.

[8]Westchester and Nassau are two of the state's wealthiest regions (Brent & Monk, in press).

states that continue to decrease state aid in favor of local support.

The simulations also predict that New York would realize greater improvements in student equity using statewide rather than regional approaches. The equity gains produced by statewide approaches were due largely to revenue shifts from downstate (including NYC) to upstate districts. Because NYC is disadvantaged by statewide approaches, it is unlikely that the finance plan would be supported by New York's policymakers. Of course, NYC is an atypical district, and policymakers in other states may find the revenue flows produced by statewide approaches less problematic.

Implicit in their design, regional nonresidential ETB approaches did not produce the large revenue shifts that occurred with statewide variations. Accordingly, when measured at the BOCES level, regional approaches improved student equity better than statewide approaches. In fact, 90% of the BOCES reported improvements in at least four equity statistics under regional approaches.

Looking beyond the equity statistics reported herein, there may be other reasons for policymakers to favor one type of nonresidential approach to another. For example, regional approaches permit regions to set their own tax rates on nonresidential property. Component districts, therefore, have a louder voice in supporting educational programs than would be the case with statewide approaches. On the other hand, regional approaches require that local regions levy, collect, and distribute pooled revenues. If administrative units are not already in place, regions must create and maintain a service unit to perform these functions.

Ultimately, it is policymakers and not scholars who must make the difficult judgments where positions are balanced and compromises reached. These judgments are informed by the kind of information provided in this study. However, the reform of a school finance system is a risky undertaking. The risk arises because a school finance system designed under one set of economic and political conditions may be inappropriate years later. This study provides insight into efficacy of nonresidential ETB approaches to school finance, but does not suggest that policymakers commit to this type of reform. Policymakers must inspect these findings and support the policy that best enhances their objectives.

References

Berne, R., & Stiefel, L. (1984). *The measurement of equity in school finance equity.* Baltimore, MD: Johns Hopkins University Press.

Billings, R. B., & Folsom, R. N. (1980). Voter perception of property tax incidence as revealed by school expenditure decisions. *National Tax Journal, 33,* 459-471.

Brazer, H. E., & McCarty, T. A. (1989). *Municipal overburden: Its influence on education expenditures in cities.* (ERIC Document Reproduction Service No. ED 316 594)

Brent, B. O., & Monk, D. H. (in press). Public schools and public dollars. In T. A. Hirschl & T. B. Heaton (Eds.), *New York in the 21st Century.* Westport, CT: Greenwood Press.

Casey, D. T. (1996). *The basics of Texas public school finance.* Austin, TX: Texas Association of School Boards.

Center for the Study of the States. (1995). *Public school finance programs of the United States and Canada 1993-94.* Albany, NY: The Nelson A. Rockefeller Institute of Government, State University of New York at Albany.

Downes, T. A., & Pogue, T. F. (1992). Intergovernmental aid to reduce fiscal disparities: Problems of definition and measurement. *Public Finance Quarterly, 20,* 468-482.

Firestone, W. A., Goertz, M., & Natriello, G. (1997). *From cashbox to classroom: The struggle for fiscal reform and educational change in New Jersey.* New York: Teachers College Press.

Gurwitz, A. S. (1982). *The economics of public school finance.* Cambridge, MA: Ballinger Publishing Company.

Kearney, C. P. (1995). Reducing local school property taxes: Recent experience in Michigan. *Journal of Education Finance, 21,* 165-185.

Killian, M. G. (1984). Local control--The vanishing myth in Texas. *Phi Delta Kappan, 66, 192*-195.

Kirst, M. W. (1984). The changing balance in state and local power to control education. *Phi Delta Kappan, 66,* 189-191.

Ladd, H. F. (1975). Local education expenditures, fiscal capacity, and the composition of the property tax base. *National Tax Journal, 28,* 145-158.

Ladd, H. F., & Harris, E. W. (1995). Statewide taxation of nonresidential property for education. *Journal of Education Finance, 21,* 39-56.

Lawton, S. B. (1985). Economic models to explain school board expenditures in Ontario. *Journal of Education Finance, 11,* 236-257.

Mathis, E. J., & Zech, C. E. (1986). An examination of the relevance of the median voter model: Empirical evidence offers support for the model and certain uses. *American Journal of Economics and Sociology, 45,* 403-412.

Megdal, S. B. (1984). A model of local demand for education. *Journal of Urban Economics, 16*(1), 13-30.

Monk, D. H., & Brent, B. O. (1997). *Raising money for education: A guide to the property tax.* Thousand Oaks, CA: Corwin Press, Inc.

Picus, L. O. (1991). Cadillacs or Chevrolets?: The evolution of state control over school finance in California. *Journal of Education Finance, 17,* 33-59.

Reeder, R. J. (1990). *Targeting aid to distressed rural areas: Indicators of fiscal and community well-being* (Report No. AGES 9067). Washington, DC: U.S. Department of Agriculture, Economic Research Division, Agriculture and Rural Economy Division.

Richard, M. R. (1996). *The effect of the composition of the property tax base on educational expenditures in Pennsylvania.* (ERIC Document Reproduction Service No. ED 385 919)

Stark, K. J. (1992). Rethinking statewide taxation of nonresidential property for public schools. *The Yale Law Journal, 102,* 805-834.

Strike, K. (1988). The ethics of resource allocation in education: Questions of democracy and justice. In D. H. Monk & J. Underwood (Eds.), *Microlevel school finance* (pp. 143-180). Cambridge, MA: Ballinger.

Swanson, A. D., & King, R. A. (1997). *School finance: Its economics and politics.* New York: Longman.

Turnbull, G. K. (1987). Alternative local public education expenditure functions: An econometric evaluation. *Public Finance Quarterly, 15,* 45-60.

U.S. Department of Education. (1994). *The condition of education in rural schools.* Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

U.S. Department of Education. (1995). *State comparisons of education statistics: 1969-70 to 1993-94.* Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

University of the State of New York. (1993). *Statewide profile of the educational system.* Albany, NY: The State Education Department.