How School Districts Respond to Fiscal Constraint

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About the Author

Helen F. Ladd is a Professor of Public Policy Studies and Economics at Duke University and also Director of Graduate Studies in Public Policy. She earned her Ph.D. in economics from Harvard University and taught at Harvard's Kennedy School of Government before moving to Duke in 1986. Much of her current research focuses on education policy, particularly performance-based approaches to reforming schools. She is the editor of *Holding Schools Accountable: Performance-Based Reform in Education* (Brookings Institution, 1996). She currently co-chairs the National Academy of Sciences Committee on Education Finance; Equity, Adequacy, and Productivity.

An expert on state and local public finance, Professor Ladd has written extensively on the property tax, education finance, tax and expenditure limitations, intergovernmental aid, state economic development, and the fiscal problems of U.S. cities. In addition, she has coauthored books on discrimination in mortgage lending and the capitalization of property taxes and edited a volume on tax and expenditure limitations. She has been a visiting scholar at the Federal Reserve Bank of Boston, a senior research fellow at the Lincoln Institute of Land Policy, and a visiting fellow at the Brookings Institution.

Selected Papers in School Finance

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Introduction

Throughout the 1980s and early 1990s, many school districts were less fiscally constrained than they are likely to be in the future. Many state governments responded to the 1983 report, *A Nation at Risk*, by providing substantial additional resources to local schools to improve education. In addition, the 1980s expansion of the economy made it possible for districts to raise additional funds from local sources, and declines in student enrollment meant that per pupil spending could rise even in districts where spending was not increased. The situation in the early 1990s and the outlook for the future are less sanguine. Projections of increasing enrollment, less rapid growth in the economy, and increasing competition for funds at the state and local level mean that school districts are likely to experience significantly more fiscal pressure in the future than they have in the recent past.

Given the outlook for more fiscal constraint, it would be useful to know something about how districts typically respond to fiscal constraint. Hence the purpose of this paper is to determine how districts have responded to fiscal constraint in the past as a way of gaining insight into how they might respond in the future.

This question can be addressed in various ways. One approach is to use a panel data set for districts in a specific state to look at how school districts have responded over time to various pressures such as increasing enrollments, the growth in students requiring special education, or cutbacks in aid. A recent paper by Hamilton Lankford and James Wyckoff (1996) provides an excellent example of this approach. Using a rich data set for 693 districts in New York state covering the period 1960 to 1993, they found that a substantial fraction of the increase in education spending was allocated to special education. In addition, they discovered that districts adjusted their administrative spending asymmetrically in response to changes in resources: districts increased administrative spending more in response to an increase in resources than they decreased administrative spending in response to a reduction in resources. Moreover, because Lankford and Wyckoff were in effect model-

ing changes in budget allocations, they were able to use their estimated parameters to project how New York school districts were likely to respond to future changes in fiscal pressures. As is evident from their study, the use of a panel data set is clearly essential for examining the short run dynamic responses of districts to fiscal pressure.[1]

A second approach is illustrated in a recent paper by David Figlio (1996). He used data from the Schools and Staffing Survey (SASS) to examine how local tax limitation measures affected school inputs and some school outputs. Because property taxes account for almost all the tax revenue of local school districts, statewide constitutional amendments or statutory requirements that limit the local property tax can directly affect the ability of local school districts to raise money for education. Exploiting the fact that not all states have such limitation measures, Figlio found that such limitations were associated with larger classes, shorter instructional periods, lower starting salaries for teachers, and lower lifetime discounted teacher salaries. Figlio's use of the SASS data represents an innovative approach for examining the impact of tax limitations. It also represents a creative way to examine how districts respond to fiscal constraint, an approach that is marred only by the observation that until one does the analysis, one cannot be sure that the limitations are binding and that, therefore, the districts are constrained.

. . . My research strategy is to use cross sectional data at one point in time . . . to develop a measure of the fiscal condition of each district and . . . to examine the choices made by school districts that face differing degrees of fiscal pressure.

In the same spirit, Dye and McGuire (1996) examined the effects of property tax limits on school districts in the Chicago metropolitan area. Building on the observation that not all school districts in the relevant counties were subject to property tax limits, Dye and McGuire found that property tax limits reduced the growth in total education spending by about 3 percent and spending per pupil by about 2.5 percent. Interestingly, however, they found no statistically significant evidence of any reduced growth in instructional spending. Thus, in the face of binding tax limits school districts appear to have tried to preserve the growth of instructional spending.

In this paper, I develop a third approach, one with its own strengths and weaknesses. One of my initial goals was to develop a methodology that could be used for a large number of states using the Common Core of Data (CCD) generated by the National Center for Education Statistics (NCES). Because the CCD information on finances is available only for the fiscal years 1990, 1991, and 1992, it does not represent a long enough panel to examine the short run dynamics of school district responses over time. Instead, the data are better suited for cross sectional analysis. Hence, my research strategy is to use cross sectional data at one point in time first to develop a measure of the fiscal condition of each district and second to examine the choices made by school districts that face differing degrees of fiscal pressure. This strategy sheds no light on how districts are likely to respond in a short run, dynamic sense to changes in their fiscal constraints. Any predictions from this analysis about responses to **changes** in constraints must be made with caution. At best, the cross sectional results reported below apply to the effects of changes in fiscal constraints that are in place for a period of time long enough for districts to fully adjust.

In section I, I explain and present my preferred measure of a district's fiscal condition and in section II show how I implemented it for Texas. Unfortunately, the measure cannot be estimated based on the CCD data alone.

[1] In the same vein, other researchers have examined the dynamic responses to fiscal constraints in specific districts. For example, see Hess (1991) for an examination of staff cuts during the fiscal crisis of the Chicago School System in the early 1980s. Hess reports that in response to the fiscal crisis, employees with student contact (such as classroom teachers and aides) were cut 18 percent, administrative and technical personnel were cut 14 percent, and support staff (including clerical and maintenance personnel) were cut 17 percent (p. 24, table 1.3). Interestingly, the relatively large cut in personnel with student contact occurred not in the subcategories of teachers and educational support staff but rather in the category of teacher aides.

Hence, I had to turn to state-specific data. In section III, I examine the choices made by Texas school districts in response to their differing fiscal conditions. These choices are of three types: those relating to the allocation of the budget among spending categories, the pattern of staffing, and the quality of the educational environment as measured, for example, by the ratio of pupils to teachers. Data about these choices come both from state-specific sources and from the CCD. In section IV, I look at comparable choices made by the New York Districts based on the CCD data alone.

Measuring a District's Fiscal Condition

By the fiscal condition of a school district, I am referring to the gap between a district's capacity to raise revenue for education and its expenditure need, where both capacity and need reflect factors outside the immediate control of local school officials (see Ladd and Yinger, 1991 for the development of this approach and its application to major U.S. cities). The idea is to develop a measure that is independent of the district's specific spending and taxing decisions but that accurately reflects the fiscal constraints it faces in making those decisions. In contrast to simpler measures of fiscal condition that typically focus exclusively on a district's capacity to raise revenue, this measure also incorporates the fact that some districts must spend more money per student than others to attain a given level of educational services.

As I described in an earlier article, (Ladd 1994), a jurisdiction's revenue-raising capacity and its expenditure need can each be measured in two ways. The primary component of a jurisdiction's revenue-raising capacity is the amount of revenue it could reasonably be expected to generate from local taxes. The simplest approach to measuring that capacity is as a weighted average of the jurisdiction's tax bases, where the weights are state-wide average tax rates for each base. Because school districts rely almost exclusively on property taxes, this approach would focus only on the base of the property tax and would calculate how much revenue the district would generate per pupil if it taxed that base at an average rate. Implicit in this approach is the value judgement that the appropriate way to achieve comparability across districts is to ask how much revenue they each would generate if they had a similar tax rate.

A second, and conceptually more satisfying, approach would start with the income of the district's residents and ask how much revenue the district could generate if it imposed an average tax burden on its residents (defined as taxes collected from residents as a proportion of their income), taking into account that the taxes from residents would be augmented by tax revenue from nonresidents. Nonresidents bear part of the burden of the property tax either because they own property in the district or because the burden of part of the tax is shifted to them in the form of higher prices, lower wages, or lower returns to capital. In contrast to the first approach, this second approach achieves comparability across districts by treating all districts as if they were willing to impose the same tax burden on district residents.

. . . The fiscal condition of a school district . . . the gap between a district's capacity to raise revenue for education and its expenditure need . . .

Although the second approach is conceptually more appealing than the first approach, it is difficult to implement. Not only does it require information on the composition of the tax base in each district, but it also requires that estimates be made about how much of the tax burden on each type of property is shifted to nonresidents. Therefore, in this study, I rely exclusively on the tax base approach. Fortunately, the two measures are often highly correlated. For Minnesota cities, for example, Ladd, Reschovsky, and Yinger (1991) found that the correlation was 0.92. However, for New York the correlation is only 0.7 (Duncombe and Yinger, 1995). Nonetheless, practicality argues in favor of the tax base approach. Because even the more limited data requirements for this approach are not met in

the CCD given that the data base includes no information on the size of the property tax base, I must rely on state-generated data for at least part of the information needed to implement this measure of capacity. Note, in addition, that revenue-raising capacity has a second component, namely, revenue in the form of federal or state aid. Hence, the amount of intergovernmental aid received by a district must be added to the measure of own-source capacity to get a complete picture of a district's capacity to generate revenue.

With respect to expenditure need, the task is to determine how much it would cost per pupil for a district to provide an average level of services to its students . . .

With respect to expenditure need, the task is to determine how much it would cost per pupil for a district to provide an average level of services to its students, given that the costs of educational inputs vary across districts and some types of students are more costly to educate than others. Two approaches are available. With either approach, the goal is to measure differences in costs that reflect only those factors outside the control of local school officials. For example, consider a district that pays above-average salaries to its teachers. Whether these high salaries translate into above-average costs as defined here, and consequently into high need, depends on the reason the salaries are high. If they reflect the district's decision to recruit high quality teachers or its inability to bargain effectively with the teacher's union, then the high salaries are under the district's control and not part of the constraints it faces. However, to the extent that the high salaries reflect an above-average local cost of living which forces the district to pay more simply to attract teachers, then the high salaries are outside the control of school officials and are appropriately included.

One approach to measuring educational costs by district would be to combine measures of appropriately-measured differences in the costs of teachers and other inputs with estimates of the differential costs associated with educating different types of students, such as those with learning disabilities or those with limited proficiency in English. Note that both parts are needed. A resource cost index alone of the type developed for teachers, for example, by Jay Chambers would not be sufficient.[2] Even if Chambers' measure were extended to include the cost of inputs other than teachers, it would be necessary to supplement it. The cost index for teachers indicates the differential costs of hiring a teacher, but does not incorporate the fact that more teachers may be needed to educate certain groups of children. Thus, at a minimum the resource cost index would need to be supplemented with a measure of the differential costs of educating different groups of students. However, this approach is problematic because of the *ad hoc* nature of most of these cost estimates.[3]

A second approach to measuring interdistrict variation in the costs of providing an average level of education services is to estimate them from an equation explaining the variation in per pupil spending across districts. Provided that the equation controls for the other major determinants of spending differences, such as those associated with wealth differences across districts, the coefficients of "cost factors" can be used to develop a cost index for each district. This second strategy is the one I pursue in this study. For Texas, I have implemented the strategy with data generated by the Texas Education Agency. For New York, I relied on cost estimates produced by Duncombe and Yinger (1995).

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[2] The teacher cost index developed by Jay Chambers uses a hedonic wage model to determine what each district would have to pay for teachers with similar characteristics given the factors outside the district's control (Chambers and Fowler, 1995). These factors include the tightness in the labor market for teachers, the local cost of living, and the amenities (or disamenities) of the local region.

[3] See, for example, the discussion of adjusting for student needs in NCES (1995). The *ad hoc* nature of the student-need adjustments used in New York state's school aid formula is documented in a recent study of cost differentials in New York (Duncombe, Ruggiero, and Yinger, 1996).

Fiscal Condition of Texas School Districts

Table 1 provides the spending equation from which the cost indexes and expenditure need estimates were calculated for Texas school districts. Most of the data used to estimate the equation came from the Texas Academic Excellence Indicator System (AEIS), not from the CCD. The equation is based on 993 districts, all of which go through the 12th grade. Following Ladd and Yinger (1991), the equation models district spending per pupil as a function of demand and preference variables, and a set of cost factors. Although the effects of the cost factors are of most interest, other variables representing the local demand for education services must be included in the equation as control variables. The first seven variables in table 1 are included for that reason. They are: the market value of property per pupil, the percentage of the tax base that is residential, the average number of pupils per household, personal income in the district per pupil, federal and state aid per pupil, and transportation costs per pupil. The residential share of the tax base represents a "tax price" variable, in that the higher is the share, the higher is the share paid directly by residents. Because a higher price typically leads to lower demand, the sign is expected to be negative. All of the variables come in with the expected signs and, with the exception of the percentage of the tax base that is residential, all are statistically significant at standard levels.

Of more direct interest are the eight cost factors, all of which represent characteristics of the district that may affect the per pupil costs of educating students. These variables include the percentages of students who are in special

Table 1.—Expenditure equation used to estimate the cost index for Texas school districts (Dependent variable: log per pupil spending)

	Coefficient	t-statistic
Cost variables		
Property tax base per pupil (log)	0.162	12.50
Income per pupil (log)	0.079	4.09
Residential percent of tax base (log)	-0.011	-1.50
Students per household (log)	0.172	8.70
Federal revenue per pupil (log)	0.081	9.28
State revenue per pupil (log)	0.033	3.72
Transportation costs per pupil (log)	0.018	3.58
Cost factors		
Special education students as a percent of all students	0.003	3.12
Limited English speaking students as a percent of all students	0.002	4.13
Economically disadvantaged students as a percent of all students	0.002	5.77
Secondary students as a percent of all students	0.004	7.91
Student enrollment (log)	-0.335	-15.95
Student enrollment squared (log)	0.018	13.66
Cost of living (log)*	0.194	1.26
Rural - 1 if district is rural, 0 otherwise	-0.002	-0.21
Constant	5.283	7.13
Number of observations	993	
Adjusted R^2	0.77	

* Based on 1991 study by McMahon and Chang, as reported in NCES, 1995, *Disparities in Public School District Spending*, 1989–90. 95-300, Washington, DC.

SOURCE: Except as noted, the data are from the Texas Academic Excellence Indicator System.

education programs, have limited English proficiency, are economically disadvantaged, and are in secondary school; the logarithm of student enrollment and its square; a cost-of-living index; and an indicator variable that reflects whether or not the district is in a rural area. Higher percentages of each of the specified categories of students are likely to raise the per pupil cost of education and, as indicated by the positive coefficients, do so in all cases. The negative coefficient on the student enrollment variable and the positive coefficient on the squared term indicate the presence of economies of scale up to an enrollment of about 11,000 students beyond which costs per student begin to rise.

. . . The variation across districts in the simulated expenditure represents variation only in the cost factors . . .

The cost-of-living index serves as a proxy for the costs of educational inputs; in areas with a higher cost of living, school districts have to pay more to attract teachers and to purchase supplies. This index distinguishes between costs only in the major metropolitan areas and the nonmetropolitan areas.[4] In contrast to many other states, the variation across Texas school districts is not very great, which probably accounts for the variable's statistical insignificance. Although the rural indicator variable is not significant, it has been included for completeness given that many people believe that rural areas face special educational challenges.

From this spending equation, a cost index was constructed for each district using the following procedure. The per pupil expenditure of each district was simulated based on the assumption that the district had average values of all the control variables, but its actual values for all the cost factors. Hence, the variation across districts in the simulated expenditure represents variation only in the cost factors, that is, in characteristics of each district that are outside the immediate control of school officials and that are likely to affect how much it has to spend to provide a given quality of education. Dividing a district's simulated spending by average per pupil spending generates an index of costs for each district in which the district with average costs has a cost index equal to 1. An index above 1 indicates that a district must spend more than the typical district to purchase a given level of educational outcomes. An index below 1 indicates that the district has an advantage relative to other districts in that the cost of providing a given package of education services to its students is below the state average. A district's expenditure need is then calculated as state-wide average per pupil spending adjusted by the district's cost index.

The fiscal condition of each district is defined as:

$$FC_i = (RRC_i - EN_i)/RRC_i$$

where RRC_i is the district's capacity to raise revenue (including local taxes and intergovernmental aid) and EN_i is the district's expenditure need, both of which are measured per pupil. Fiscal condition greater than zero implies that the district has sufficient revenue-raising potential to meet its expenditure need, where both are measured relative not to an absolute standard but rather relative to other districts within the state. A negative value indicates that the district has a large expenditure need relative to its capacity to raise revenue and, hence, is in relatively poor fiscal

[4] The cost-of-living indexes were produced by McMahon and Chang (1991) and reported in NCES (1995), Appendix D. In place of the cost-of-living index, I could have used Chamber's cost index for teachers (see footnote 2). The cost-of-living index has two small advantages over Chamber's teacher-cost-index. First, it is relevant for the costs of all inputs, not just teachers, and second, as Chambers acknowledges, the teacher-cost-index may be slightly biased given that the hedonic wage equation from which it is derived does not fully control for teacher quality. One potential disadvantage of the cost-of-living index, namely that it does not account for the effect on salaries of variation across districts in the characteristics of students, does not apply in this case since student characteristics are also included in the spending equation reported in table 1. This means that the cost-of-living index—or the Chambers teacher-cost-index if that were used—picks up the effects on spending only of the differing costs of inputs and that the variables that characterize the students, such as the percent with limited proficiency in English, pick up the effect of such students both on the salaries of teachers and on the quantity of such teachers who are hired.

condition. The more negative is the index the greater is the fiscal pressure faced by the district. The index has a straightforward interpretation. For example, a negative index value of -0.20 indicates that the district would need a boost in its per pupil revenues of 20 percent to meet its expenditure need. Conversely, a positive index value of +0.20 indicates the district could raise 20 percent more revenue at the average tax rate than it would need to meet its expenditure need, and hence has the option of setting a lower tax rate or of providing an above-average quality of education.

The index of fiscal condition ranges from -0.31 to +0.93 across the 993 Texas districts, with a mean of 0.07 and a standard deviation of 0.15.[5] To reiterate, the fiscal condition measure should be interpreted strictly in state-specific terms: capacity to provide what is deemed an average quality of education in Texas could be deemed inadequate for a district in another state in which average spending, and presumably, the quality of education were higher. Moreover, what matters for the subsequent analysis is not so much the specific value of a district's fiscal condition as the condition of one district relative to another.

Table 2 presents descriptive information by districts grouped into quintiles by fiscal condition. As shown in the first column, the average index of fiscal condition ranges from -.08 to 0.31 across the five categories. The revenue shares and spending measures are calculated from both state-specific AEIS data and data from the CCD. As can be seen, the two data sources provide comparable information. The table indicates that the districts in the strongest fiscal condition receive a substantially larger share of their revenue from local taxes than do districts in poorer fiscal condition and that their share of revenue from the state government is correspondingly lower. Despite the fact that, by construction, additional intergovernmental aid adds to a district's capacity to raise revenue, it is the capacity to raise revenue from local sources that distin-

Table 2.—Sources of revenue and spending levels by categories of fiscal condition (Texas school districts)

Categories of fiscal condition (observations)	Average fiscal condition	Average share of revenue[1]			Average spending per pupil[1](in dollars)	
		Local	State	Federal	Unadjusted[2]	Adjusted[3]
I - Poorest	-0.082	0.417	0.519	0.064	$4,252	$4,324
(198)		0.416	0.512	0.072	4,283	4,338
II - Poor	-0.002	0.412	0.517	0.071	4,367	4,544
(199)		0.407	0.517	0.076	4,327	4,493
III - Average	0.049	0.359	0.568	0.074	4,652	4,705
(199)		0.356	0.563	0.081	4,537	4,588
IV - Good	0.100	0.412	0.512	0.076	4,970	4,953
(199)		0.413	0.506	0.081	4,695	4,685
V - Best	0.309	0.602	0.333	0.065	6,221	5,806
(198)		0.594	0.339	0.066	5,942	5,562

[1] First entry in each cell is based on Academic Excellence Indicator System (AEIS) data. Second entry is based on Common Core of Data (CCD) data.

[2] Current spending per pupil not adjusted for estimated cost differences.

[3] Current spending per pupil deflated by estimated cost differences.

SOURCE: Based on data from the CCD and the Texas AEIS.

[5] Note that I could easily have normalized the index to have a mean of zero, but saw no compelling reason to do so. The fact that the mean is not zero simply reflects that some districts have disproportionately large tax bases.

guishes the districts with the strongest fiscal condition from those facing more fiscal pressure. The final two columns report average spending per pupil, adjusted and unadjusted for cost differences. Based on the CCD data (the second entries in each cell), average unadjusted spending varies from about $4280 per pupil to $5940 per pupil. After adjusting for the costs, using the cost index described earlier, per pupil spending ranges from $4320 to about $5560. This smaller range reflects the fact that the costs in Texas of providing a given quality of education services tend to be higher in the districts in good fiscal condition than in those in poor fiscal condition.

My empirical strategy is . . . to see how budget shares or staffing patterns are affected by a district's fiscal condition . . .

To summarize, as measured here, a district's fiscal condition is intended to represent the fiscal constraint under which the district operates, relative to that in other districts. On average, stronger fiscal condition is associated with higher cost-adjusted per pupil spending on education and presumably, to better educational outcomes.

Effects of Fiscal Constraint on Decisions of Texas School Districts

Armed with this measure of fiscal condition, we are now in a position to look at how fiscal condition affects the school district budget allocation and staffing decisions in Texas, using both AEIS data and the CCD. The locally generated AEIS data set is useful for its richness. The CCD data are advantageous in that results based on that nationally produced data set can be directly compared across states.

The analysis is designed to shed light on how school districts have adjusted to differences in their fiscal condition associated with any one of a variety of causes outside the control of local school officials, such as differences in the amount of intergovernmental aid they receive, differences in the value of their property tax wealth, and differences in the proportions of high-cost students they serve. This research strategy is not designed to look in detail at fiscal responses to each component separately. Instead, it captures all their effects in a single variable, fiscal condition.

My empirical strategy is straightforward. The idea is to see how budget shares or staffing patterns are affected by a district's fiscal condition, controlling for other obvious determinants of such patterns. Thus, the dependent variable in most of the equations is a variable such as the proportion of the operating budget allocated to instruction, or the share of the staff working in administration. The main explanatory variable is the district's fiscal condition, which is included in both its linear and squared form to allow its effects to be nonlinear. All equations also include four other control variables: student enrollment (and its square), personal income per pupil, and the fraction of students from economically disadvantaged households. These variables are included to control for the fact that budget and staffing decisions are likely to be influenced by the number of students in the district, the preferences of the district's taxpayers (as proxied by personal income), and the need for special programs as proxied by students from economically disadvantaged households. For example, to the extent that there are economies of scale in administrative expenditures, we would expect the share of spending on administration to be smaller in large school districts than in small districts. While the specific choice of control variables is somewhat arbitrary, it is important that a reasonable set be included so as to isolate the independent effects of fiscal condition.

Reported in the tables are three summary measures of how fiscal condition affects budget and staffing patterns. (Full equations are available from the author.) The first is the marginal effect of fiscal condition, calculated at the mean value of fiscal condition. The other two measures indicate the differences in the budget or staffing shares associated with differences from the mean of one standard deviation in either direction. The more nonlinear is the estimated equation, the more these

final two measures of impact differ. The entries in the final column are of most interest in that they indicate the impact on budget shares of fiscal constraint, where a fiscally constrained district is defined to be one that has a fiscal condition index that is one standard deviation below the average.

Given that most of the dependent variables are expressed as proportions or shares of the total, one must be careful in interpreting the results. First, consider a finding that fiscal condition has no measurable impact on, for example, the share of spending allocated to administration at the school level. This finding does not imply that a district in poor fiscal condition would spend the same **amount** on school administration as a district in strong fiscal condition. In fact, because weaker fiscal condition is associated with lower per pupil spending on education (as can be seen, for example, by the average spending patterns in table 2), the finding that fiscal condition exerts no impact on the **share** of spending devoted to administration simply means that administrative spending would vary across districts in line with the variation in per pupil spending.

Consider first the signs of the estimated marginal impacts on the shares. They indicate the direction of the nonproportional differences in the various spending and staffing categories associated with differences in a district's fiscal condition. As such, they indicate which categories of spending districts are likely to protect or disproportionately cut as part of their equilibrium response to a long-run deterioration in their fiscal condition. The signs in the following tables should be interpreted as follows. A **positive** marginal impact of fiscal condition implies that spending or staffing on the specified category is disproportionately higher in districts in stronger fiscal condition than in others. A **negative** marginal impact implies that spending or staffing on that category is disproportionately lower in districts in strong fiscal condition. As I noted earlier, the final column is of most interest. A positive entry in this column indicates that a constrained district spends a larger share on the indicated category. A negative entry indicates that it spends a smaller share.

It is worth emphasizing once again that the estimated impacts come from a cross sectional model and at best, reflect long run responses to changes in fiscal condition that are anticipated to continue for a long period of time. In the short run, the existence of long-term contracts and various types of political pressures may make school districts respond differently in the short run than in the long run to changes in their fiscal condition, especially if they expect the change to be temporary. In the short run, districts may not have much choice in how to respond to a deterioration in their fiscal condition; the question in the short run may well be not what would they like to cut, but what **can** they cut? The long run equilibrium nature of the estimates reported here mean that such short run considerations are not directly relevant.

Impacts on Budget Allocations

Table 3 reports results for a variety of budget categories. Looking first at the categories defined by the AEIS, and focusing on the results in the final column of the table, we find that fiscally constrained districts devote about 1.6 percent more of their operating budgets to instruction than do districts with average fiscal condition. This larger share comes at the expense of the shares devoted to instructional administration (down 4.8 percent), central administration (down 6.1 percent), and plant services (down 2.7 percent). The shares devoted to student support services, campus administration, and "other" do not vary systematically with a district's fiscal condition.

These estimates imply first that fiscally constrained districts try to protect instructional spending. However, they are not able to do so very effectively in that the small 1.6 percent increase in the share devoted to instruction applies to a significantly lower overall operating

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Table 3.—Estimated impact of fiscal condition on budget categories, Texas school districts[1]

Budget category (mean value)	Marginal effect of fiscal condition[2]	Impact of 1 standard deviation difference	
		Positive (%)	Negative (%)
As a proportion of operating budget (AEIS)			
Instruction (0.579)	-0.055	-1.4	1.6
Instructional administration (0.011)	0.004	5.6	-4.8
Student support services (0.044)	not significant	—	—
Campus administration (0.054)	not significant	—	—
Central administration (0.080)	0.031	5.5	-6.1
Plant services (0.106)	0.017	1.9	-2.7
Other (0.126)	not significant	—	—
As a proportion of total budget (AEIS)			
Operating (0.894)	-0.037	-0.7	0.6
Capital outlay (0.056)	0.052	13.9	-14.5
As a proportion of current expenditures (CCD)			
Instruction (0.592)	-0.059	-1.4	1.5
Support services (0.328)	0.068	3.0	-3.2
Central administration (0.080)	0.020	3.6	-4.0
Non-instruction (0.080)	-0.009	-1.6	1.8
As a proportion of total expenditure (CCD)[3]			
Capital outlay (0.078)	not significant	—	—

— Not applicable because of insignificant coefficient.

[1] The Academic Excellence Indicator System (AEIS) equations are based on data from FY 1994 and the Common Core of Data (CCD) data from FY 1992. See appendix for further explanation.

[2] Based on coefficients of fiscal condition and fiscal condition squared in a regression equation that also includes student enrollment, student enrollment squared, personal income per pupil, percent of students who are economically disadvantaged and a constant. The full equations are available from the author. The estimated impacts were calculated at the mean value of fiscal condition, 0.07.

[3] Capital outlays and total expenditures were both averaged over fiscal years 1990 to 1992. The figures were all deflated by the Gross National Product (GNP) deflator for structures as reported in the *1996 Economic Report to the President.*

SOURCE: Texas AEIS and CCD.

budget. Specifically, a one standard deviation decline in fiscal condition is associated with about a 13 percent decline in the operating budget.[6] Despite its somewhat larger share, per pupil spending on instruction is about 11 percent less in the fiscally constrained district than in the average district.

Constrained districts also spend less per pupil on central administration and instructional administration. In these cases the two effects move in the same direction: constrained districts have smaller operating budgets and on average devote smaller proportions of these budget to these administrative categories. Some observers might be tempted to conclude from these estimates that fiscal pressure is a reasonable way to induce districts to reduce their spending on administration. However, that conclusion would be simplistic and inappropriate. Even if cuts in administration, especially central administration, were deemed desirable, inducing reductions through cutbacks in the resources available to school dis-

[6] This estimate comes from an equation in which the operating spending (in logarithmic form and based on the AEIS) is regressed on fiscal condition, fiscal condition squared, and the four control variables. The equation implies that a difference in fiscal condition of 0.15 (equal to one standard deviation) is associated with a 0.13 difference in operating spending per pupil.

tricts would carry a large cost in the form of reduced instructional spending, and, as noted below, larger class sizes. Moreover, it could be the case that the long run equilibrium results reported here overstate the short run changes that are likely to occur in response to a deterioration in fiscal condition. As noted in the introduction, Lankford and Wyckoff (1996) find that in the short run, school districts decrease central administrative expenditures less in response to a deterioration in fiscal pressure than they increase such spending in response to an improvement in their fiscal situation.

The finding that fiscal constraint is associated with a lower share for plant services, that is for maintenance, is consistent with the finding in the next part of the table for capital outlays. Like maintenance, capital outlays (expressed as a proportion of the total budget) are positively related to a district's fiscal condition. The estimate implies that the share of spending that a fiscally constrained district devotes to capital spending would be about 14.5 percent below that in the district with average fiscal condition. Thus, poor fiscal condition imposes a double whammy in that overall spending is lower and a smaller share of that spending is devoted to building and maintaining school facilities than is true for better off districts. Thus, a district that is fiscally constrained over a long period of time is likely to end up with significantly worse educational facilities than other districts.[7]

A similar picture emerges from the CCD spending categories reported at the bottom of table 3. Again, better fiscal condition is associated with a decline in the share of the total expenditure allocated to instruction, and an increase in the share for support services. Support services in the CCD is a broad category that includes student support services such as guidance and health; instructional support and librarians; central administration; school administration; business, operation and plant maintenance; student transportation services; and central expenditure such as information services and data processing. The only subcategory for which data were available and which yielded a statistically significant impact is central administration.[8]

The results for this subcategory are comparable but somewhat smaller than those based on the CCD data : fiscal constraint leads to a 4 percent reduction in the share which contrasts with a 6.1 percent reduction according to the AEIS data. The share devoted to non-instructional spending, which includes food services and other auxiliary enterprise operations such as bookstores, is slightly negatively related to fiscal condition. Hence, fiscally constrained districts devote slightly larger shares of their budgets to this category than do other districts.

The final section of table 3 reports the insignificant relationship between fiscal condition and capital outlay based on the CCD data. This finding is surprising and contrasts quite sharply with the large impact that emerged from the AEIS data. I explored two measures of capital outlay. The first is simply capital outlay in 1992 as a share of total expenditures in 1992. Because capital spending can be lumpy, the second measure is calculated as the average capital outlay relative to spending over a three year period. The table reports the latter measure. However, for neither measure did a statistically significant impact emerge.[9]

. . . A district that is fiscally constrained over a long period of time is likely to end up with significantly worse educational facilities than other districts.

Impacts on Staffing Patterns

As reported in table 4, the findings for staffing patterns tell a similar story. As shown

[7] This finding about capital outlays is fully consistent with the findings reported by the NCES in their study of disparities in education spending (NCES, 1995).

[8] The general subcategory called "other" was not available for Texas school districts. This category includes, among other things, spending on maintenance.

[9] I have not been able to determine the cause of the different results for the AEIS and the CCD data. The two series are not very highly correlated which by itself is not too surprising given that the AEIS is for the 1993–94 fiscal year and the latest single year for the CCD is 1991–92. Because fiscal condition best reflects the more recent period, the AEIS estimates are preferred.

Table 4.—Estimated impact of fiscal condition on staffing patterns, Texas school districts[1]

Staff category (mean value)	Marginal effect of fiscal condition[2]	Impact of 1 standard deviation difference	
		Positive (%)	Negative (%)
As a proportion of professional staff (AEIS)			
Teachers (0.857)	-0.027	-0.5	0.5
Professional support (0.067)	not significant	—	—
Campus administration (0.045)	not significant	—	—
Central administration (0.031)	0.017	7.7	-8.7
As a proportion of total staff (AEIS)			
Professional (0.630)	-0.044	-1.0	1.1
Educational aides (0.103)	-0.005	-0.6	0.9
Auxiliary staff (0.266)	0.056	2.6	-2.8
As a proportion of total staff (CCD)			
Teachers (0.729)	not significant	—	—
Aides (0.142)	not significant	—	—
Special[3] (0.033)	not significant	—	—
School administration[4] (0.045)	0.011	3.6	-3.8
District administration[5] (0.026)	0.008	4.2	-5.0

— Not applicable because of insignificant coefficient.

[1] The Academic Excellence Indicator System (AEIS) equations are based on data from FY 1994 and the Common Core of Data (CCD) data are from FY 1993. See appendix for further explanation.

[2] Based on coefficients of fiscal condition and fiscal condition squared in a regression equation that also includes student enrollment, student enrollment squared, personal income per pupil, percent of students who are economically disadvantaged, and a constant. See appendix for sample size. The estimated impacts were calculated at the mean value of fiscal condition, 0.07

[3] Includes instructional coordinators, guidance counselors, and library/media specialists.

[4] Includes school administration, support staff, and student support staff.

[5] Includes local education agency (LEA) administration and support staff.

SOURCE: Texas AEIS and CCD.

in the final column, teachers account for a slightly larger proportion of the professional staff in fiscally constrained districts than in the typical district while central administration accounts for a smaller share. Because teachers account for so much more of the professional staff, the positive percentage impact on the share for teachers is tiny compared to the 8.7 percent reduction in the share of central administration. Once again, however, one must be careful in drawing policy implications: While fiscal constraint reduces the share of central administration, it does so at the cost of reducing the number of teachers. The middle panel indicates that fiscally constrained districts have slightly higher proportions of their total staffs in teaching positions and smaller proportions in nonteaching positions.

The CCD data yields a relatively comparable picture. The primary difference is that fiscal constraint appears to have no observable impact on the share of the professional staff employed as teachers, aides, or for special purposes. However, comparable to previous findings, fiscal constraint is associated with smaller shares of school administrative staff and district administrative staff. Hence, fiscally constrained districts have disproportionately fewer support staff to address the range of problems such districts face. They are clearly caught between a rock and a hard

place. The only way to maintain the share of administrators would be to reduce the number of teachers, teacher aides, and related personnel.

School Quality

Studies of school quality typically focus on three measurable school inputs: pupil teacher ratios (which are positively correlated with, but are not the same thing as, class size[10]), the experience of teachers, and the post graduate education of teachers. The extent to which these measurable school inputs affect student performance as measured by test scores remains in doubt. In a recent paper based on Alabama data, Ferguson and Ladd (1996) find evidence that smaller class sizes, and a greater proportion of teachers with post graduate degrees positively affect student performance. In contrast we find no evidence that years of experience matter. Here, I look at how fiscal condition affects school districts' decisions about the three types of school inputs.

As shown in the top section of table 5, fiscal condition directly affects pupil teacher ratios. More specifically, better fiscal condition is associated with lower pupil teacher ratios. The estimated marginal impacts imply that fiscally constrained districts are likely to have pupil-teacher ratios, and hence class sizes, that are 6–8 percent higher than typical districts. The findings in Ferguson and Ladd (1996) imply that this difference would translate into weaker student performance.

Table 5 also shows the impact of fiscal condition on the distribution of teachers in terms of teacher experience. Stronger fiscal condition is associated with smaller proportions of beginning teachers and those with 6 to 10 years of experience and larger proportions of teachers with more than 10 years of experience. For fiscally constrained districts (as shown in the final column), the shares of beginning teachers exceed those of the average district by 9 percent and their share of experienced teachers falls short of the typical district by 5.8 percent. Although the empirical linkage between fiscal condition and teacher experience is quite clear, the implications for student learning are less clear. Ferguson and Ladd's estimates suggest that these differences might have little effect on student learning. Finally, the bottom row of the table summarizes the effects of fiscal condition on several measures of the distribution of teachers by their educational background. For none of the included variables (such as proportion of teachers with a master's degree) did a statistically significant coefficient emerge.

The clearest story to emerge from table 5 is that fiscal constraint hurts students by making it necessary for schools to have larger classes.

. . . that fiscal constraint hurts students by making it necessary for schools to have larger classes.

New York School Districts

In contrast to Texas, New York school districts spend a lot more money on elementary and secondary education and exhibit greater variation across districts. These differences make New York an interesting state for exploring the generalizability of the Texas findings about how school districts respond to fiscal constraints. Unfortunately, I do not have access to the detailed data by district for New York that I had for Texas and must rely more heavily on the CCD data.

However, missing from the CCD data are some of the key variables needed to estimate a district's revenue-raising capacity and its expenditure need. With respect to revenue-raising capacity, the main missing variable is the

[10] Pupil-teacher ratios typically understate average class size since not all teachers spend all of their time in class. Moreover, the concept of an average class size may be misleading to the extent that it includes both very small classes for students with special needs and potentially much larger classes for regular students. Ideally, it would be preferable to measure class size from information on teacher files that indicates the class sizes for the regular classes that they teach. See, for example, Ferguson and Ladd, 1996.

Table 5.—Estimated impact of fiscal condition on measures of school quality, Texas school districts[1]

Staff category (mean value)	Marginal effect of fiscal condition[2]	Impact of 1 standard deviation difference: Positive (%)	Impact of 1 standard deviation difference: Negative (%)
Pupils per teacher			
AEIS (13.61)	-6.89	-7.4	7.8
CCD (13.87)	-5.62	-5.9	6.3
Experience of teachers			
As a proportion of all teachers (AEIS)			
Beginning (0.066)	-0.039	-8.4	9.0
1–5 years (0.266)	not significant	—	—
6–10 years (0.197)	-0.067	-5.1	5.3
11–20 years (0.309)	0.087	3.9	-4.5
> 20 years (0.162)	0.061	5.4	-5.8
Post-graduate education of teachers	not significant	—	—

— Not applicable because of insignificant coefficient.

[1] The Academic Excellence Indicator System (AEIS) equations are based on data from FY 1994 and the Common Core of Data (CCD) data are from FY 1992. See appendix for further explanation.

[2] Based on coefficients of fiscal condition and fiscal condition squared in a regression equation that also includes student enrollment, student enrollment squared, personal income per pupil, percent of students who are economically disadvantaged, and a constant. The full equations are available from the author. The estimated impacts were calculated at the mean value of fiscal condition, 0.07.

SOURCE: Texas AEIS and CCD.

value of the district's property tax base. With respect to expenditure need, a crude estimate of a district's cost index could be estimated from CCD data, but state-generated data allows for a more complete estimate. Given these limitations of the CCD data, I chose to use cost indexes recently estimated for New York by Duncombe and Yinger (1995) with Ruggiero (1996) and also their data on property tax valuations. With these two additions, I then used the CCD data to estimate the fiscal condition of 632 New York school districts.

Duncombe and Yinger's cost index is similar in spirit to the one discussed in section I for the Texas districts in that the goal was to determine the average impacts on costs of a variety of cost factors. However, Duncombe and Yinger have refined the approach in two significant ways. First, because they had access to data on educational outcomes, they were able to replace the demand variables in the spending equation, such as income and the tax price variable, with what the districts actually chose, as measured by three educational outcome variables (percent of students with high test scores, the percent receiving the Regents diploma, and the percent who do not drop out). This substitution is appropriate provided that the authors recognize, as they did, that the outcome measures are simultaneously determined with public spending and therefore require the use of statistical techniques to account for simultaneity. Second, they included an efficiency index intended to control for differences in the efficiency with which districts provide education.[11] The cost factors used to construct the cost index include an estimate of teacher salaries (standardized for a given level of education and experience

[11] Their measure of inefficiency is based on a technique called data envelopment analysis, or DEA. This nonparametric programming technique compares the spending of each district with the spending of other districts that deliver the same quality of public services. See Duncombe and Yinger, 1995, p. 10 and Duncombe, Ruggiero, and Yinger (1996). Both the outcome variables and the efficiency variable were estimated as endogenous variables in the spending equation.

so as to minimize the potential for this to be a variable chosen by the district), student enrollment (and its square), and the percentages of children in poverty, of households that are headed by females, of students who are severely handicapped, of students who have limited English proficiency, and of students who are in high school.

Based on the same measure of fiscal condition as described earlier, the resulting measure of fiscal condition for 632 New York districts has an average value of -0.017, a standard deviation of 0.23, and ranges from -1.33 to +0.82. Thus, as measured both by the standard deviation and the range, the variation in fiscal condition across the New York districts exceeds that for the Texas districts.

Table 6 essentially replicates for New York the summary data presented in table 2 for Texas school districts. Notice the much larger variation across the district groupings in the share of revenue from local taxes and correspondingly from the state government. The average share of revenue from local taxes in the districts with the best fiscal condition is about twice that in the districts with the poorest fiscal condition. Also the share of revenue from the federal government is smaller in all five categories than it was in Texas, which largely reflects the much greater spending by New York districts. This spending is shown in the final two columns. Before it is adjusted for differences in costs, (see the first of the two spending figures), average per pupil spending varies from $6,722 to $10,491. That the lowest average spending emerges for the second rather than the first group of districts reflects the fact that many of the districts in the poorest fiscal condition face high costs. This explanation is confirmed by the next column, which represents per pupil spending adjusted by the cost index provided by Duncombe and Yinger, which is also the one used to construct the measure of fiscal condition. Note that once this adjustment for costs is made, the districts in the worst fiscal condition are seen to spend the least per student.

Impact of Fiscal Condition on Budget Categories

Table 7 reports the estimated impacts of fiscal condition on the budget categories for New York school districts. The marginal impacts reported in the first column are directly comparable to those reported for Texas districts in the bottom panel of table 3 and exhibit similar patterns. In particular, better fiscal condition is associated with a smaller budget share for instruction and a larger share for support services, which includes administrative expenditures and maintenance. The marginal impacts are generally smaller for New York but the implications are essentially the same: New York districts that are fiscally constrained devote smaller shares of their budgets to support services in return for an increase the share for instruction. Because instructional spending accounts for such a large share of current expenditure, the percentage reductions in shares for support services exceed the gain in shares for instructional spending.

. . . The districts in the worst fiscal condition are seen to spend the least per student.

Also, like the results for capital outlays based on the AEIS data for Texas (but, curiously, not the CCD data) differences in fiscal condition across New York school districts lead to the greatest variation in capital outlays. According to the table, fiscally constrained districts devote to capital outlays a share of the total budget that is about 10.4 percent lower than that in the typical district.

Impact on Staffing Patterns

Table 8 reports the impacts fiscal condition on district staffing decisions. The pattern with respect to teachers is as expected: better fiscal condition leads to a smaller share of teachers and poorer fiscal condition to a greater share of teachers. Virtually no effect emerges for teacher aides, although the squared term enters with a positive and statistically significant coefficient.

Table 6.—Sources of revenue and spending levels, by categories of fiscal condition, New York school districts

Categories of fiscal condition (observations)	Average fiscal condition	Average share of revenue			Average spending per pupil (in dollars)	
		Local	State	Federal	Unadjusted[1]	Adjusted[2]
I - Poorest (126)	-0.303	0.375	0.583	0.042	$7,042	$6,042
II - Poor (127)	-0.111	0.388	0.578	0.035	6,722	6,825
III - Average (126)	-0.028	0.438	0.534	0.028	7,064	7,612
IV - Good (127)	0.053	0.519	0.453	0.028	7,749	8,382
V - Best (126)	0.305	0.735	0.248	0.017	10,491	10,733

[1] Current spending per pupil not adjusted for estimated cost differences.

[2] Current spending per pupil adjusted by cost index from Duncombe and Yinger.

SOURCE: Common Core of Data (CCD) and data provided by William Duncombe and John Yinger.

Table 7.—Estimated impact of fiscal condition on budget categories, New York school districts[1]

Budget category (mean value)	Marginal effect of fiscal condition[2]	Impact of 1 standard deviation difference	
		Positive (%)	Negative (%)
As a proportion of current expenditure			
Instruction (0.639)	-0.025	-0.9	0.9
Support services (0.335)	0.026	1.8	-1.8
Central Administration (0.028)	0.008	6.8	-6.4
Instructional Staff (0.030)	0.006	4.0	-4.7
Other, including maintenance (0.196)	0.022	2.6	-2.6
Non-instruction (0.026)	-0.001	-0.8	1.1
As a proportion of total expenditure[3]			
Capital outlay (0.082)	0.036	10.4	-10.4

[1] The equations are based on budget data from FY 1991. See appendix for further explanation.

[2] Basic measure of fiscal condition is the measure described in text as the gap between a district's revenue-raising capacity and its expenditure need as a proportion of its revenue-raising capacity. The entries in this column are calculated from the coefficients on the fiscal condition variable and fiscal condition squared in a regression equation that also includes student enrollment, student enrollment squared, personal income per pupil, percent of children living in poverty, and a constant term. The estimated impacts were calculated at the mean value of fiscal condition, -0.017.

[3] Capital outlays and total expenditures were both averaged over fiscal years 1990 to 1992. The figures were all deflated by the Gross National Product (GNP) deflator for structures as reported in the *1996 Economic Report to the President.*

SOURCE: Common Core of Data (CCD).

Somewhat perplexing are the results for the shares of the staff devoted to school administration and central administration. Previous findings for both Texas and New York would have led one to predict that stronger fiscal condition would be associated with greater staffing shares devoted to both categories of administration and that fiscal constraint would be associated with lower shares. Yet, the patterns are just the reverse: compared to the typical district, fiscally constrained districts appear to have larger shares of their staffs in administrative positions.

The puzzle is most obvious for central administration. According to table 7, stronger fiscal condition is associated with a greater share of spending on central administration.

But table 8 implies the apparently contradictory conclusion that stronger fiscal condition is associated with a smaller share of staff in central administration. The most obvious explanation has to do with the likely pattern across districts of salary levels for administrative staff. It could well be that the fiscally constrained districts choose to keep former teachers employed by moving them into administration at relatively low salaries while the districts with stronger fiscal condition employ fewer administrators but at higher salaries.

Impact on Pupil Teacher Ratios

Finally, table 9 reports the impacts of the two measures of fiscal condition on the pupil-teacher ratio. As was true for Texas school districts, better fiscal condition is associated with fewer pupils per teacher. The implication for districts with poor fiscal condition are clear: such districts are likely to have larger classes than districts with average fiscal condition. Ferguson and Ladd's study (1996) suggests that if the resulting class sizes were in the mid to high 20s for the elementary grades, student test scores are likely to be lower than they would be with smaller classes.

Generalizability

The picture that emerges from the analysis of New York school districts is very similar to that which emerges for Texas school districts. Poorer fiscal condition is associated with a greater **share** of spending on instruction and a larger **share** of the staff in teaching. Nonetheless, their limited overall spending means that districts in poor fiscal condition are likely to spend less per pupil on instruction and to employ fewer teachers relative to the number of their students. The effect is larger pupil-teacher ratios and larger class sizes. That the New York findings generally confirm those for Texas suggests that the patterns reported for Texas are not idiosyncratic and that the story summarized here is apparently generalizable across states.

Table 8.—Estimated impact of fiscal condition on staffing patterns, New York school districts[1]

Staff category (mean value)	Marginal effect of fiscal condition[2]	Impact of 1 standard deviation difference	
		Positive (%)	Negative (%)
As a proportion of total staff			
Teachers (0.517)	-0.028	-1.2	1.4
Aides (0.069)	0.000	-0.2	0.1
Special[3] (0.023)	not significant	—	—
School administration[4] (0.101)	-0.019	-4.4	4.5
Central administration[5] (0.075)	-0.010	-3.2	3.2

— Not applicable because of insignificant coefficient.

[1] The equations are based on staffing data from FY 1993. See appendix for further explanation.

[2] Basic measure of fiscal condition is the measure described in text as the gap between a district's revenue-raising capacity and its expenditure need as a proportion of its revenue-raising capacity. The entries in this column are calculated from the coefficients on the fiscal condition variable and fiscal condition squared in a regression equation that also includes student enrollment, student enrollment squared, personal income per pupil, percent of children living in poverty, and a constant term. The estimated impacts were calculated at the mean value of fiscal condition, -0.017.

[3] Includes instructional coordinators, guidance counselors, and library/media specialists.

[4] Includes school administrators, support staff, and student support staff.

[5] Includes local education agency (LEA) administration and support staff.

SOURCE: Common Core of Data (CCD).

Table 9.—Estimated impact of fiscal condition on measures of school quality, New York school districts[1]

Measure (mean value)	Marginal effect of fiscal condition[2]	Impact of 1 standard deviation difference	
		Positive (%)	Negative (%)
Pupils per teacher			
Common Core of Data (CCD) (13.8)	-2.70	-4.6	4.6

[1] The equations are based on budget data from FY 1991. See appendix for details.

[2] Basic measure of fiscal condition is the measure described in text as the gap between a district's revenue-raising capacity and its expenditure need as a proportion of its revenue-raising capacity. The entries in this column are calculated from the coefficients on the fiscal condition variable and fiscal condition squared in a regression equation that also includes student enrollment, student enrollment squared, personal income per pupil, percent of children living in poverty, and a constant term. The estimated impacts were calculated at the mean value of fiscal condition, -0.017.

SOURCE: Common Core of Data (CCD).

Conclusion

This investigation shows that districts respond to fiscal constraints by trying to protect the level of instructional spending. Evidence for this emerges from the finding that the share of the budget allocated to instructional spending is slightly higher in fiscally constrained districts than in districts in average fiscal condition. However, despite these efforts, districts experiencing serious fiscal constraint are still likely to spend less on instructional spending than their better-off counterparts: a larger share of a smaller total pie still leads to lower spending on instruction. The primary consequences are a higher pupil-teacher ratio and the use of less experienced teachers. These results are consistent with those that emerge from David Figlio's 1995 study of the effects of property tax limitation measures in which he finds that tax limitations are associated with larger classes, shorter instructional periods, and lower teacher salaries.

A second finding is that central administration spending and staffing appear to be a luxury. That is, stronger fiscal condition is associated with a larger share of spending on central administration and conversely, poorer fiscal condition is associated with lower spending on administration—both because of lower overall spending and because the share of that spending devoted to central administration would be lower. This finding, it should be noted, runs counter to that of Figlio who finds no evidence that districts subject to property tax limitations reduced their spending on administration. In light of the finding reported here, some people might be tempted to argue for increasing fiscal stringency as a way to reduce administrative spending. However, this study shows that there could be significant costs associated with that strategy. Even if districts tried to become leaner and meaner, the evidence reported here suggests that muscle, in the form of instructional spending, would also be cut.

A third finding is that the category of capital outlays emerges as the most responsive to a district's fiscal condition. According to the best estimate for Texas (based on the AEIS data), capital spending in a district with fiscal condition one standard deviation below the average is likely to account for about 15 percent less as a share of total spending than in a district with average spending. When combined with the fact that the total budget in such a district is also likely to be lower by about 13 percent, this 15 percent decline in the share translates into about a 26 percent shortfall in capital spending relative to that in a district in

average fiscal condition.[12] New York districts also appear to respond to fiscal constraint by spending a smaller proportion on capital spending. While the magnitude of the response is a bit smaller than in the Texas districts, the overall conclusion is the same and fully consistent with, it should be noted, to the findings of a recent NCES study of variation in spending patterns across districts. Such a finding is not at all surprising given that politicians facing fiscal constraints have strong incentives to try cut the least visible spending categories. Yet the consequences are potentially severe. Annual shortfalls in capital spending and maintenance in response to an extended period of fiscal constraint are likely to leave some districts with serious deficiencies in their capital plants.

[12] This estimate was calculated as follows, where C is capital outlays, s is the budget share, and B is the total budget for a typical district. For a fiscally constrained district, the capital share is (0.85)s and the total budget is (0.87)B. Capital spending in that district is (0.85)(0.87) =0.74 times the capital spending in the typical district, therefore, capital spending is lower by 26 percent.

Appendix

The full equations underlying the results reported in the text tables are available from the author. As noted in the text, the dependent variable in most of the equations is a variable such as the proportion of the operating budget allocated to instruction, or the share of the staff working in administration. The explanatory variables are the district's fiscal condition (included in both linear and squared form), and the following control variables: student enrollment (and its square), personal income per pupil, and the fraction of students from economically disadvantaged households.

Texas

The Texas equations are all based on 1993 school districts. This set of districts represents those that remained after the Academic Excellence Indicator System (AEIS) and Common Core of Data (CCD) data sets were merged and observations not common to both were dropped. In addition, six observations were dropped because total property value was zero, six were dropped because the district reported no residential property, and six were dropped because the district reported no federal revenue. Finally, 14 outliers were dropped.

All AEIS information is based on fiscal year 1994, the staffing data are from the CCD fiscal year 1993, and all other CCD data are for fiscal year 1992.

New York

The New York equations are based on 632 observations which represents the set for which all data, including the cost index from Duncombe and Yinger, were available. The budget share equations are based on CCD data for fiscal year 1990–91. The staffing equations for fiscal year 1991–92. The cost index for New York is based on 1991 data.

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