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## Abstract

[Excerpt] This chapter presents analyses of the compensation and mobility of school superintendents in New York State during the 1978-79 to 1982-83 period. The focus is on school superintendents because they are the chief operating officers of school districts, their salaries are determined through individual "negotiations" with school boards, and their salary data were made available to us. In contrast, school principals' salary data were not available to us. Especially in large districts, principals tend to be members of a union and their salary increases negotiated collectively, which limits the likelihood of observing individual principals' salaries being related to measures of their school's performance.



## Keywords

school superintendents, compensation, mobility, performance, salary


## Disciplines

Education | Educational Assessment, Evaluation, and Research | Elementary and Middle and Secondary Education Administration | Labor Economics | Labor Relations

## Comments


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# 12 ARE SCHOOL SUPERINTENDENTS REWARDED FOR "PERFORMANCE"?

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The April 1983 report of the National Commission on Excellence in Education, *A Nation at Risk*, focused public attention on the need to reform public education. Among its most hotly debated proposals was one to institute merit pay plans for teachers, despite the fact that historically merit pay plans have not met with much success in public education, at least partially because certain characteristics of public education make their implementation problematic (see, for example, Bacharach, Lipsky, and Shedd 1984 and Murnane and Cohen 1986).

Somewhat surprisingly, less attention has been directed to the role that educational administrators (school principals and superintendents) play in the educational process and their methods of compensation. Given their roles in a variety of areas, including the recruitment and continual motivation of teachers, the design of curriculum, the setting of educational goals, and their management of school district resources, one might expect administrators' actions to be of importance in determining both how much students learn and the

We are grateful to the numerous school superintendents who responded to the survey used in this chapter, to the staff of the Cornell Institute of Social and Economic Research for acquiring a number of the data tapes that we used, to Eileen Driscoll for facilitating our use of these data, and most especially, to Jeffrey Keefe for his assistance coding and analyzing data during the early stages of the project. We are also deeply indebted to numerous colleagues at Cornell, the NBER, and other institutions for their comments on earlier drafts.

cost of public education to taxpayers (see the "effective school" literature, in for example, Bossert, et al. 1982, Kroeze 1982, and Hallinger and Murphy 1982). Yet there has been little public call for formal merit pay plans for school administrators. This is puzzling because studies of individual (as opposed to group) merit or incentive pay plans in the for-profit sector of the economy find that they tend to be concentrated at upper levels of management, where fundamental policy and managerial decisions are made, rather than at levels covering all employees (see Milkovich and Newman 1984).

In fact, although there is a voluminous literature on the determinants of teachers' salaries (see Ehrenberg and Schwarz 1986 and Lipsky 1982), little is known about the forces influencing the compensation of school administrators. In particular, little evidence is available about whether school administrators explicitly or implicitly are rewarded for their school districts' performance by higher compensation and/or greater opportunities for mobility to higher-paying positions.[1] Such evidence is clearly important for policy debate; unless there is evidence that school administrators' compensation is at least implicitly tied to their district's "performance," a case can be made that consideration should be given to building incentives for improving school district performance explicitly into their compensation arrangements.

This chapter presents analyses of the compensation and mobility of school superintendents in New York State during the 1978–79 to 1982–83 period. The focus is on school superintendents because they are the chief operating officers of school districts, their salaries are determined through individual "negotiations" with school boards, and their salary data were made available to us.[2] In contrast, school principals' salary data were not available to us. Especially in large districts, principals tend to be members of a union and their salary increases negotiated collectively, which limits the likelihood of observing individual principals' salaries being related to measures of their school's performance.

The discussion begins in the following section with a description of the characteristics of school superintendents in New York State, including their patterns of mobility and compensation. To provide information on the structure of school superintendents' compensation, multiple regression analysis is used to estimate the extent to which superintendents' salaries are related to characteristics of both their school districts and themselves. Estimates of the extent to

which superintendents' probabilities of mobility and salary changes are related to measures of their school districts' "performance" are then discussed. Finally, in the last two sections we discuss whether school superintendents appear to influence these school district "performance" measures and the implications of our findings for public policy.

A crucial element in the study is the definition of *performance.* Because school districts and their school board members are idiosyncratic and evaluate superintendents' performance in a wide variety of ways, our methodology is to focus on a few well-defined outcomes. Specifically, we assume that school districts value high educational performance and low school tax rates, each relative to the comparable outcome in "similar" school districts in the state.[3] The discussion is nontechnical in nature; technical details, including underlying tables of statistical findings, can be found in other work of ours (Ehrenberg, Chaykowski, and Ehrenberg 1986, 1988).

## DESCRIPTIVE STATISTICS ON SCHOOL SUPERINTENDENTS IN NEW YORK STATE

To obtain background data on the characteristics of school superintendents in New York State, a survey was mailed to the approximately 700 school districts in the state (excluding New York City) in May 1985, and a follow-up survey sent to nonrespondents in July of that year. We received 496 responses; this represents almost a 70 percent response rate. The sample appears to be representative of superintendents in the state; the response rate did not vary systematically with either school district size or with whether the county in which the district was located was upstate or downstate.

Table 12-1 presents some descriptive statistics for the sample. Respondents averaged nearly forty-nine years of age and first became superintendents at about the age of forty. The typical superintendent had been at his or her job for six years and had close to three years' total tenure in previous superintendents' positions. About 50 percent of the sample had received a certificate of advanced study in school administration, while close to 40 percent had received a doctorate degree.

Table 12-2 tabulates the distribution of respondents by years on their current job. Superintendents in the sample spent between one

Table 12-1. Descriptive Statistics.[a]

| Variable | Sample Size | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| *AGE* | 466 | 48.91 | 7.05 | 33 | 69 |
| *AGEF* | 466 | 40.02 | 6.56 | 25 | 62 |
| *TEN* | 495 | 6.07 | 5.04 | 1 | 28 |
| *NUM* | 495 | 0.60 | 0.98 | 0 | 8 |
| *EXPS* | 495 | 2.76 | 4.40 | 0 | 23 |
| *SIZE* | 192 | 0.43 | 0.76 | 0 | 2 |
| *CDEG* | 490 | 0.48 | 0.50 | 0 | 1 |
| *DDEG* | 494 | 0.38 | 0.49 | 0 | 1 |

a. Sample sizes are less than the overall sample of 496 due to nonreporting of data.

*AGE* = age in years.
*AGEF* = age when first became superintendent.
*TEN* = number of years at current position.
*NUM* = number of previous superintendent positions.
*EXPS* = total years tenure at previous positions.
*SIZE* = (for individuals who held a previous superintendent position) previous district was smaller (0), about the same size (1), or larger (2) than current district.
*CDEG* = 1 = has a certificate of advanced study; 0 = no.
*DDEG* = 1 = has a doctorate degree; 0 = no.

and twenty-eight years in their current jobs and the longer the job tenure, the smaller the number of superintendents observed. Indeed, a simple semilog function fit the data very well and implies that the number of superintendents with any given level of tenure on the job is roughly 19 percent more than the number with one additional year of tenure.

Finally, Table 12-3 presents data on the total number of superintendent positions held in each respondent's career, by age category of respondent. Although one hears much talk about how mobile superintendents are, the vast majority of superintendents in the sample had held (as of the survey date) less than four positions during their lifetimes (panel A). When they did change positions, they tended to move to larger districts; however, the probability that a job change led them to a smaller district increased as they aged (panel B).

Our analyses of superintendents' compensation use data from the over 700 school districts in New York State during the 1978–79 to 1982–83 period obtained from the New York State Education De-

**Table 12-2.** Tenure on Current Job.

| *Years Tenure* | *Number* | *Years Tenure* | *Number* |
|---|---|---|---|
| 1 | 81 | 15 | 12 |
| 2 | 64 | 16 | 8 |
| 3 | 48 | 17 | 8 |
| 4 | 54 | 18 | 5 |
| 5 | 42 | 19 | 5 |
| 6 | 33 | 20 | 2 |
| 7 | 24 | 21 | 1 |
| 8 | 27 | 22 | 1 |
| 9 | 19 | 23 | 1 |
| 10 | 15 | 24 | 1 |
| 11 | 12 | 25 | 1 |
| 12 | 14 | 26 | 0 |
| 13 | 10 | 27 | 0 |
| 14 | 6 | 28 | 1 |

Note: Fitting a semilog function to the first twenty-five years observations yields

$$\log(\text{number}_i) = 4.688 - .190\ (\text{years tenure } i) \quad \bar{R}^2 = .946$$
$$(.138)\ (.009)$$

**Table 12-3a.** Number of Superintendent Positions Held, by Age.[a]

| *Number of Positions* | *All* | *Age Category* | | | |
|---|---|---|---|---|---|
| | | *< 40* | *40-49* | *50-59* | *> 59* |
| 1 | 303 | 40 | 117 | 105 | 41 |
| 2 | 128 | 10 | 51 | 60 | 7 |
| 3 | 44 | 0 | 10 | 27 | 7 |
| 4 | 11 | 0 | 3 | 7 | 1 |
| 5 | 4 | 0 | 0 | 3 | 1 |
| 6 | 3 | 0 | 0 | 2 | 1 |
| 7 | 0 | 0 | 0 | 0 | 0 |
| 8 | 1 | 0 | 0 | 1 | 0 |
| 9 | 1 | 0 | 0 | 1 | 0 |
| Total | 495 | 50 | 181 | 206 | 58 |

**Table 12-3b.** Comparison of Size of Current and Last School District for People Who Have Held at Least Two Positions.[a]

| *Current District Size Is* | *All* | *Age Category* | | | |
|---|---|---|---|---|---|
| | | *< 40* | *40–49* | *50–59* | *> 59* |
| Larger | 141 | 10 | 54 | 63 | 9 |
| About the same | 19 | 0 | 5 | 13 | 1 |
| Smaller | 32 | 0 | 4 | 21 | 7 |
| Total | 192 | 10 | 63 | 102 | 17 |

a. Sum of age categories does not equal entire sample because some superintendents did not report their birth years.

partment's Basic Educational Data System (BEDS) annual school district tapes.[4] Panel A of Table 12–4 reports salary data for the superintendents in the BEDS sample. The mean salary of superintendents in the sample rose from slightly under $35,000 in 1978–79 to over $44,000 in 1982–83. Each year the variation in salaries across districts was large; for example in 1982–83 superintendents in the state earned between $20,000 and $71,000, with the standard deviation in salaries equaling almost $10,000. Much of this variation is clearly due to the wide variation of school district sizes in the sample, however, as we demonstrate below, other factors are also important.

The BEDS data also permit us to track if a superintendent remained in the same school district for two consecutive years, moved from one district to another school district in the state during the period, or moved from one school district in the state to "out of sample" status. In the latter case, the superintendent may have retired or died, may have moved to another superintendency outside of New York State (previous studies suggest the vast majority of school superintendents serve in only one state during their lifetime; see Knezevich 1971), may have moved to a different educational position (nonsuperintendent) in another district in the state, or may have switched to a noneducational position. Alternatively, the school district may simply have failed to report data in the second year.

The data in Panel B of Table 12–4 suggest that the *annual* turnover rates of school superintendents are low, as each year between

**Table 12-4a.** School Superintendents' Salaries in New York State: 1978-79 to 1982-83.

| *Year* | *Number of Districts Reporting* | *Mean* | *Standard Deviation* | *Minimum* | *Maximum* |
|---|---|---|---|---|---|
| 1978-79 | 701 | 34,964 | 8,325 | 17,500 | 58,500 |
| 1979-80 | 700 | 36,614 | 8,617 | 17,500 | 61,500 |
| 1980-81 | 698 | 38,936 | 8,978 | 18,500 | 64,500 |
| 1981-82 | 689 | 41,665 | 9,479 | 22,785 | 71,000 |
| 1982-83 | 675 | 44,227 | 9,887 | 20,000 | 71,000 |

**Table 12-4b.** Mobility of School Superintendents in New York State: 1978-79 to 1982-83.

| *Years* | *A* | *B* | *C* | *D* |
|---|---|---|---|---|
| 1978-79 to 1979-80 | 727 | 610 (84%) | 28 (4%) | 89 (12%) |
| 1979-80 to 1980-81 | 719 | 624 (87) | 29 (4) | 66 (9) |
| 1980-81 to 1981-82 | 715 | 582 (81) | 42 (6) | 91 (13) |
| 1981-82 to 1982-83 | 720 | 634 (88) | 28 (4) | 58 (8) |

Source: Authors' calculations from data on the New York State Education Department's Basic Educational Data System (BEDS) School District Tapes for 1978-79 to 1982-83. Excluded each year are New York City, districts where the position is vacant, and districts that failed to report salary information.

A = number of superintendents in the sample in the first year.

B = number (percentage) of superintendents in the first year who were in the same district in the second year.

C = number (percentage) of superintendents in the first year who moved to another district in the state in the second year.

D = number (percentage) of superintendents in the first year who were not employed in any district in the sample in the second year.

81 and 88 percent of the superintendents continued in their current job.[5] Each year only 4 to 6 percent of the superintendents moved to another district in the state, while 8 to 13 percent of the superintendents dropped out of the sample.

## CROSS-SECTIONAL VARIATION IN SUPERINTENDENTS' SALARIES

A superintendent's salary would be expected to be higher in districts that wish to attract and retain outstanding superintendents. These would probably be the larger districts (where more students are affected by the superintendent's action), wealthier districts (where the demand for education is likely to be greater), districts that contain a high proportion of highly educated adults (who are likely to have a strong "taste" for education), and districts whose students have special educational needs (such as those with a large proportion of minority students). On the other hand, characteristics of the superintendent should also matter. More experienced and more highly educated superintendents are likely to be able to command higher salaries.

Table 12-5 reports attempts to see if these forces do matter. Estimates of annual cross-section salary equations of the form

$$\log(W_i) = a_0 + a_1 X_i + a_2 S_i + \epsilon_i \qquad (12.1)$$

where $W_i$ is the annual salary of superintendent $i$, $X_i$ is a vector of school district characteristics in the employing district, $S_i$ is a vector of characteristics of the superintendent, and $\epsilon$ is a random error term, are reported there. As noted in the table, the school district data used in the analyses come from a variety of federal and state sources. The characteristics of the superintendents come from two volumes of *Who's Who in Educational Administration*, the directory of members of the American Association of School Administrators, and the responses to our survey of all school superintendents employed in New York State in 1984–85.[6]

As expected, the characteristics of school districts prove to be important determinants of superintendents' salaries. Other things held constant, in each year larger districts (as measured by the logarithm of total enrollment *LENR*), wealthier districts (as measured by the logarithms of property values per enrolled student *LVAL*), per cap-

ita personal income in the county (*LY*1), or census year (1979) median family income in the school district (*LY*2)), and districts that place a high value on education (as measured by the percentage of the district's adult population with greater than a college degree *PHED*) all are associated with higher superintendents' salaries.

In contrast, only two of the superintendents' characteristics, his[7] years of tenure in the current district (*TEN*) and years since receiving a bachelor's degree (*EXPG*)—the latter a rough proxy for age or total labor market experience—prove to be statistically significant. Moreover, the effects of these variables are very small, with the rate of return per year of tenure being roughly 0.6 percent and that per year since degree being roughly 0.2 percent. Somewhat surprisingly, neither the possession of a doctorate degree (*DDEG*) or a certificate of advanced study in administration (*CDEG*)—the latter an intermediate degree between a master's and a doctorate—nor the total number of years of previous experience as a superintendent in other school districts (*EXPS*) systematically are associated with salary.

Of course, it is well known, and the results of our survey confirm (see Table 12-3), that the typical mobility pattern of a superintendent (at least during the early stages of his career) is from smaller to larger and/or from poorer to wealthier districts. If this is the case, these personal characteristic variables may affect salary indirectly via influencing the characteristics of the school district in which the superintendent is located, rather than directly influencing his salary level, given his district's characteristics.

To test this hypothesis, the logarithm of property value per enrolled student and the logarithm of total enrollment in the superintendent's district were both regressed each year on the personal characteristics of the superintendent (excluding years of tenure in the current district). The results (see Ehrenberg, Chaykowski, and Ehrenberg 1986) suggest that having a doctorate degree, having more prior experience as a superintendent in other districts, and being older were associated with employment in larger school districts, while having a doctorate degree was also associated with being employed in wealthier districts.

These latter findings have important implications for the following analyses of the relationship between superintendents' compensation and school districts' performance. Even if within a given school district one was to find no relationship between a superintendent's compensation and his school district's performance, superintendents

**Table 12-5.** Determinants of School Superintendents' Salaries in New York State: Annual Cross-Sections (*absolute value of t statistics*).

| *Explanatory[a] Variable/ Academic Year* | *Logarithm of Annual Salary (SAL)* | | | |
|---|---|---|---|---|
| | *1978–79* | *1979–80* | *1980–81* | *1981–82* | *1982–83* |
| *LENR* | .127 (22.5)* | .113 (20.0)* | .117 (21.2)* | .111 (20.7)* | .110 (20.0)* |
| *LVAL* | .045 (5.8)* | .025 (4.1)* | .028 (4.8)* | .019 (3.9)* | .011 (2.3)* |
| *LY1* | .191 (5.2)* | .228 (6.5)* | .228 (6.3)* | .273 (8.4)* | .294 (9.3)* |
| *LY2* | .151 (3.6)* | .146 (3.4)* | .189 (4.3)* | .152 (3.6)* | .120 (2.9)* |
| *PNW* | .178 (2.6)* | .072 (1.2) | .032 (0.4) | -.071 (1.0) | -.111 (1.7) |
| *PHED* | .357 (2.5)* | .449 (3.0)* | .367 (2.5)* | .445 (3.1)* | .494 (3.4)* |
| *PCHL* | .200 (2.0)* | .009 (0.0) | .027 (0.3) | -.001 (0.0) | .074 (0.8) |
| *POOC* | -.073 (1.0) | .022 (0.3) | -.049 (0.7) | -.036 (0.5) | -080 (1.0) |
| *PCOL* | .185 (1.8) | -.147 (1.3) | .105 (1.1) | .224 (2.2)* | .218 (2.1)* |
| *PURB* | .014 (1.0) | .025 (1.6) | .000 (0.0) | -.019 (1.2) | -.012 (0.9) |
| *DDEG* | -.008 (0.7) | .006 (0.6) | .010 (1.0) | .013 (1.4) | .023 (2.3)* |
| *CDEG* | .000 (0.0) | -.016 (1.4) | -.014 (1.3) | -.032 (3.1)* | -.016 (1.7) |
| *EXPS* | .002 (1.1) | -.000 (0.3) | .001 (0.6) | -.000 (0.1) | -.000 (0.2) |
| *TEN* | .006 (5.3)* | .006 (5.0)* | .006 (5.5)* | .004 (3.6)* | .007 (5.7)* |
| *EXPG* | .002 (2.1)* | .003 (3.3)* | .002 (2.1)* | .002 (2.2)* | .001 (0.8) |
| $\bar{R}^2$ | .842 | .845 | .840 | .836 | .828 |
| *n* | 590 | 557 | 558 | 570 | 574 |

Sources: Authors' computations from:

1. Salaries, *LENR*, *LVAL*—New York State Education Department, Basic Educational Data System (BEDS) School District Tapes for 1978-79 to 1982-83, and New York State Education Department, Financial Data System (ST3) School District Tapes for 1978-79 to 1982-83.
2. *LY1*—U.S. Department of Commerce, Bureau of Economic Analysis, unpublished tabulations for 1978 to 1982.
3. *LY2* to *PURB*—U.S. Bureau of the Census, *1980 Census of Population*, School District Data File for New York State.
4. *DDEG* to *EXPG*—American Association of School Administrators, *Who's Who in Educational Administration*, 1976-77, 1980-81 editions, and the survey of school superintendents in New York State conducted by the authors in the summer of 1985.

a. Also included were an intercept term and dummy variables for nonreporting of the superintendents' previous experience, current job tenure, and year of bachelor's degree. Experience and job tenure were avialable for 35 to 65 percent of the sample each year, while year since degree was typically available for 70 to 80 percent of the sample.

*Coefficient statistically significantly different from zero at the .05 level; two-tail test.

*LENR* = logarithm of total enrollment in the district in the year.
*LVAL* = logarithm of the full value of property in the district per enrolled student in the year.
*LY1* = logarithm of per capita personal income in the country in the year.
*LY2* = logarithm of median family income in the district in 1979.
*PNW* = 1979 percentage of the district's population that was nonwhite.
*PHED* = 1979 percentage of the district's adult population with greater than a college education.
*PCHL* = 1979 percentage of the district's households with children at home.
*POOC* = 1979 percentage owner-occupied housing in the district.
*PCOL* = 1979 percentage of the district's adult population with some college or a college degree.
*PURB* = 1979 percentage of the district's population residing in urban areas.
*DDEG* = 1 = superintendent had a doctoral degree in the year; 0 = no such degree in year.
*CDEG* = 1 = superintendent had a certificate of advanced study in the year; 0 = no such degree.
*EXPS* = superintendent's total number of years experience in other school districts as a superintendent.
*TEN* = superintendent's years of tenure in the current district.
*EXPG* = superintendent's years since receiving a bachelor's degree.

might still be rewarded for district performance by increased opportunities for mobility to better paying positions.

## EVALUATING THE "PERFORMANCE" OF SCHOOL DISTRICTS

We assume that school boards value high academic test scores (high educational output) and low school tax rates (more money available for other public and private uses), each relative to the comparable outcome in "similar" school districts in the state and that they evaluate a superintendent (at least implicitly) by his district's performance on these criteria. It is natural to ask how these measures correspond to criteria superintendents believe school boards actually use in their evaluation. In a survey of school superintendents we asked respondents to list criteria they believed their school boards used in their evaluation. Although we gave keeping test scores high and tax rates low as two examples of criteria that might be used, the question asked was open ended and superintendents were free to respond however they wished. In cases where a formal evaluation instrument existed, the superintendent was asked to attach it to his response. Approximately 80 percent of the respondents (397 of 496) included a list of criteria in their responses and about 25 percent of these (86) attached formal evaluation instruments.

A preliminary scanning of the responses suggested that the criteria mentioned could be classified into twelve broad categories, and a count was made of the number of times each category was mentioned. These responses are tabulated in Table 12-6; because most superintendents mentioned more than one category, the total count across categories far exceeds the number of respondents.

Most striking (because we gave keeping test scores high and tax rates low as examples on the questionnaire of criteria that might be used), the most commonly mentioned criteria was community/public relations and school board relations. Fiscal management (the category that would include—but which is not limited to—keeping tax rates low) came in fourth on the list and was mentioned by about two-thirds of the respondents. Academic performance and achievement (the category in which keeping test scores high would fall) was eighth on the list and was mentioned by less than one-third of the respondents.

Table 12-6. New York State Public School Superintendents' Perceptions of the Criteria School Boards Use in Evaluating Their Performance.[a]

| *Responses* | *Number* |
|---|---|
| Overall response to the survey | 496 |
| Response to questions on criteria used in evaluation | 397 |
| Mentioned that criteria included: | |
| Community/public relations | 318 |
| School board relations | 294 |
| Staff and Personnel management | 287 |
| Fiscal management | 267 |
| Curriculum development, educational planning and leadership | 202 |
| Professional and personal development | 132 |
| General management and administration | 129 |
| Academic performance and achievement | 125 |
| Facilities management | 50 |
| Student services and relations | 49 |
| Student discipline | 26 |
| Parent relations | 25 |
| Included a formal evaluation instrument | 86 |

a. Responses from the approximately 700 school superintendents in New York State (excluding New York City) to a survey conducted by the authors in May to July of 1985.

What are the implications of these findings for the use of the objective performance measures that we propose? On the one hand, it is hard to envision objective measures that are readily available for the other ten criteria; measures of fiscal management and academic performance and achievement may be the best one can do. On the other hand, it is clear that the specific measures we use are measured with considerable error; if these errors are random, the coefficients of our performance variables will be biased toward zero in our analyses of mobility and compensation change. Furthermore, given that more than twice as many respondents mentioned fiscal management as did academic performance, one might expect that, on average, the former will prove to be more important than the latter in explaining compensation and mobility.

To give the reader a feel for how the performance measures were actually constructed, Table 12-7 presents estimates of tax rate and educational outcome equations for 1979-80 (separate equations

**Table 12-7.** 1979-80 Tax Rate and Educational Outcome Equations (*absolute value of t statistics*).

| *Explanatory Variables/Outcome* | *log (T)* | *log (GM)* | *log (AS)* |
|---|---|---|---|
| *LVAL* | -.100 (7.0)* | -.036 (1.2) | -.033 (1.6) |
| *LY1* | -.001 (0.0) | -.243 (1.3) | -.029 (0.2) |
| *LY2* | .180 (1.8)** | -.253 (1.2) | -.397 (2.8)* |
| *PNW* | .691 (4.6)* | 1.351 (4.2)* | 1.111 (5.2)* |
| *PHED* | 1.009 (2.8)* | -1.331 (1.8)** | -1.801 (3.5)* |
| *PCHL* | .979 (3.7)* | .670 (1.2) | .374 (1.0) |
| *POOC* | -.417 (2.1)* | -.689 (1.7)** | -.653 (2.3)* |
| *PCOL* | .388 (1.4) | -.685 (1.2) | -.634 (1.7)** |
| *PURB* | .271 (7.6)* | -.042 (0.6) | -.009 (0.2) |
| *D* | .006 (0.1) | .278 (2.9)* | .205 (3.1)* |
| $\bar{R}^2$ | .457 | .184 | .349 |
| *n* | 573 | 565 | 568 |

Sources: Authors' calculations are from:

1. *LVAL* to *PURB*—defined as before, see Table 12-5.
2. *T, D*—New York State Education Department, Financial Data System (ST3) School District Tape for 1979-80.
3. *GM, AS*—New York State Education Department, Pupil Evaluation Program (PEP) Test Scores.

*(**) = coefficient statistically significant from zero at .05 (.10) level of significance; two-tail set.

*T* = full value property tax rate in the school district in 1979-80.

*GM* = percentage of the district's students who scored below the state reference point on standardized 6th grade mathematics exam in 1979-80.

*AS* = average of the percentages of the district's students who fell below the state reference point on standardized third- and sixth-grade reading and mathematics exams in 1979-80.

*D* = 1 = city school district (school board sets tax rate); 0 = other school district (voters approve school budget in annual referendum).

were estimated for each year and the results are very similar across years). The tax rate variable is the logarithm of the *full-value* property tax rate in the school district (total school district property tax revenue/total value of taxable property in the school district). The educational outcome variables are the logarithms of the percentage of the district's students who fall below the state reference point on

a standardized sixth-grade mathematics examination and the average (which we computed) of the percentages who fell below the state reference point on standardized third- and sixth-grade reading and mathematics examinations.[8] Students who fall below the state reference point are deemed to require remedial services, and state aid is increased to help fund these services. Because these outcome scores measure the proportion who "fail" these tests, we are focusing on the bottom tail of the academic achievement distribution.[9]

For each of these three outcomes (0), equations were estimated of the form

$$\log 0_{ji} = b_{0j} + b_{1j} Z_i + u_{ji} \qquad j = 1, 2, 3 \qquad (12.2)$$

where $0_{ji}$ is outcome $j$ in school district $i$, $Z_i$ is a vector of school district characteristics in district $i$ expected to influence these outcomes, and $u_{ji}$ is a random error term. In fact, the variables in (12.2) are assumed to be identical to those school district variables that enter the superintendent salary equation, except that a (1, 0) "city school district" dummy variable replaces the continuous size of district variable. The latter is included here because in the large city school districts during this period the property tax rate was set by an elected school board (subject to constitutional limitations), while in the smaller school districts the tax rate was set each year by a voter referendum. One might conjecture, ceteris paribus, that in the latter situation direct voter control will lead to lower tax rates.

In the main, the estimates in Table 12-7 conform to one's prior expectations and provide reasonable explanations of the tax rates and test scores. For example, with respect to tax rates, although wealthier (*LVAL*) districts have lower tax rates, they also raise more revenue to finance education because of their higher wealth. Similarly, richer in terms of current income (*LY2*) districts have higher tax rates; districts with higher proportions of nonwhites (*PNW*), and thus special needs, have higher tax rates; districts with higher proportions of adults with more than a college education (*PHED*), and presumably greater taste for education, have higher tax rates; and districts in which a greater percentage of the households have children at home (*PCHL*), and thus greater interest in spending on education relative to keeping taxes down, have higher tax rates.[10]

Similarly, with respect to test scores, wealthier districts, districts with higher current income and districts with highly educated adults, ceteris paribus, all have lower failure rates on the tests, while districts

with a higher proportion of nonwhites have higher failure rates. Failure rates, but not tax rates, also appear to be higher in the "city" school districts. It is worth noting that the equation used to predict the average test failure rate "fits" much better than the equation used to predict the sixth-grade math test failure rate. Although it would be preferable to use the former in our analysis, as noted above (note 8) only the latter can be used in analyses that exploit the longitudinal nature of the data.

Given these estimated coefficients, corresponding to $\hat{b}_{0j}$ and $\hat{b}_{1j}$ in (12.2), one can obtain *predicted* values of the logarithm of each outcome for each school district $i$ from

$$\hat{\log} O_{ji} = \hat{b}_{0j} + \hat{b}_{1j} Z_i \qquad j = 1, 2, 3 \tag{12.3}$$

The school district's performance is then defined as the difference between the predicted and actual values of the log of each outcome.[11]

$$P_{ji} = \hat{\log} O_{ji} - \log O_{ji} \qquad j = 1, 2, 3 \tag{12.4}$$

Positive values of $P_{ji}$ indicate positive performance for the district, as positive values would occur only when predicted tax rates (or failure rates on tests) would exceed actual tax rates (or failure rates on tests) in the school district.

It is worth reemphasizing that (12.2), (12.3), and (12.4) are estimated separately each year. Thus, the equations that generate the performance measures are allowed to vary across years, as are the estimates of tax and test score performance in the district.

## SCHOOL DISTRICT PERFORMANCE AND SUPERINTENDENT MOBILITY

As noted above, each year roughly 5 percent of the superintendents in the sample moved to another school district in New York State, while roughly 10 percent dropped out. Among the former group, approximately 80 percent received salary increases, while 20 percent received the same salary after moving or suffered a salary cut. Finally, approximately 85 percent of the sample continued in their same positions. What determines whether each superintendent moves to another district with a higher salary, moves to another district with the same or lower salary, leaves the sample, or stays in the same school district each year?

To econometrically model this joint process of wage change, job change, and leave the sample would be extraordinarily complex because both school boards and superintendents are involved in this decision process. What one would ideally like to do is estimate a complete structural "matching model" that contains both employer (school board) and employee (school superintendent) decision rules. Given our limited data, we instead estimated simpler reduced form models of the form

$$\log\left(\frac{P(\text{state} = k)}{P(\text{state} = 4)}\right) = d_{0k} + d_{1k}Y + d_{2k}S + d_{3k}T + d_{4k}E + \epsilon_k$$

$$k = 1, 2, 3 \qquad (12.5)$$

where $Y$ is a vector of characteristics of the school district (a subset of the $X$ in (12.1), $S$ is the vector of superintendent characteristics, and $T$ and $E$ are the relevant tax rate and educational test score performance measures. The notation $P(\text{state} = k)$ denotes the probability that an individual is in state $k$, with the four states being change districts with a salary increase, change districts with the same or a lower salary, leave the sample, and continue on in the same district, respectively. Under suitable assumptions about the distribution of the error terms (logistic), the system in (12.5) represents a multinomial logit model and can be estimated by standard maximum likelihood methods. Each estimated coefficient in equation $k$ ($k = 1, 2, 3$) tells us how the explanatory variable associated with it affects the logarithm of the ratio of the probability of the superintendent's being in state $k$ relative to the probability of his continuing in the same district.

What relevant tax rate and educational test score performance measures should be used in this analysis? On the one hand, one might argue that relevant measures would involve *changes* in performance over time. That is, a superintendent's mobility probabilities might be influenced by whether his school district's tax rate and test score performance measures had improved or worsened over time. On the other hand, one might argue that keeping test score and tax rate performance at a constant but high (low) level might lead to higher probabilities of moving to a higher- (lower-) paying job. Ultimately,

whether a *change* in performance measure or a *level* of performance measure is correct is an empirical question; we discuss results of experimenting with various specifications below.

Suppose, however, that the focus is on the level of performance measures; the dating of the performance measures to use must still be decided. To clarify this issue, suppose we are looking at potential mobility between 1979–80 (the *base* year) and 1980–81 (the *new* year). The base-year math test (for 1979–80) was given in the spring of 1980, and a district may have received its own test results back shortly thereafter. However, there is very little chance that it would have received data on the test scores in other districts in the state prior to the next academic year (the fall of 1980). Such information would thus come too late to be used to estimate test score performance indexes that could then be used in decisions to retain the superintendent for 1980–81 and/or to try to attract a superintendent from another district whose district had high test score performance. In fact, the latest (in a temporal sense) test score performance measure that could be used in potential mobility studies between 1979–80 and 1980–81 is the index for 1978–79; we refer to this as the *lagged* year district test performance level index below.

Using a similar line of reasoning, one can show that potentially the *base* year tax level performance measure *is* available to be used in mobility decisions from the base to the new year. However, if information on school district performance is processed by school districts only with a lag, the *lagged* year tax rate performance index may again be the relevant one to use.

When equation (12.5) was estimated using the lagged year performance level measures, the lagged tax level performance measure was positively associated with the odds of moving to a higher-paying job (relative to staying) and negatively associated with the odds of moving to a lower-paying job (relative to staying).[12] Put another way, among movers the better lagged tax level performance is, the more likely the individual will move to a better job. A school district's financial performance *does* affect its school superintendent's future. The math performance variable, however, was always insignificant, perhaps because of the reasons discussed in the previous section.

As suggested from the cross-section results discussed above, having a doctorate degree was shown to increase a superintendent's chances to move to a better-paying job relative to his chances to not move. Older superintendents, as measured by years since receiving a

bachelor's degree, were less likely to move to another job and more likely to leave the sample, both relative to staying in the same district. The former clearly reflects voluntary mobility declining with age, and the latter reflects retirement rates increasing with age. Superintendents with more previous experience as a superintendent in other districts were more likely to move to both higher- *or* lower-paying jobs relative to staying in the same district; this may well reflect heterogeneity of turnover probabilities. Finally, being employed in a school district with high median family income reduced the probability of moving to a higher-paying job relative to the probability of staying. As indicated in Table 12-5, higher-income school districts pay more, thereby reducing the likely gain to mobility.

In fact, this latter result suggests that some measure of the superintendent's potential gain from mobility should be directly included in these equations. We experimented with four such measures: the logarithm of base year salary, residual from a base year log salary equation that included only superintendents' characteristics, residual from a base year log salary equation that included both superintendents' and school district characteristics, and residual from a comprehensive base year log salary equation that also included performance measures. None of these measures proved to be statistically significant (when they were included one at a time), nor did their inclusion affect the pattern of signs and significance of the other coefficients.

We also tested for the sensitivity of our mobility results to the specification of the performance variables. Four specifications were tested: base year level, lagged year level, both base and lagged year levels, and change between the base and new year. Results (see Ehrenberg, Chaykowski, and Ehrenberg 1986) indicate quite clearly that only the lagged level of tax performance matters, with better performance leading to an increased (decreased) probability of mobility to a better-paying (not better-paying) position relative to the probability of remaining on the same job.

## SCHOOL DISTRICT PERFORMANCE AND SUPERINTENDENT SALARY CHANGES

The previous section focused on the determinants of school superintendents' mobility. According to the results discussed, the higher a

school district's estimated tax rate performance in the lagged year, the greater the probability that the district's superintendent would move to a better-paying job and the lower the probability that he would move to an equal or lower-paying job, both relative to the probability of remaining in the district in the next year. Thus, superintendents in school districts with high (low) values of the tax performance measure appear to be rewarded (punished) for their district's performance. No such relationship was found, however, between a district's lagged math test performance measure and its superintendent's mobility prospects.

This section treats the mobility status of superintendents as given and examines how salary increases for both superintendents who remain in the same district for two consecutive years, and those who move to another district in New York State, were related to the lagged year tax rate and test score performance measures in the base year school district.

We estimated two salary change equations for superintendents who remained in the sample over two consecutive years. In the simplest model, salary change was postulated to be a function only of the year we were looking at (because average salary increases varied across years) and a variable that indicated whether the superintendent changed jobs during the year. The results suggested that mobility mattered; on average superintendents who changed jobs received salary increases that were 6 percent higher than those who remained in the same position. To say that on average "movers" gain is not to say, however, that mobility always pays. In fact, as noted above, approximately one-fifth of the movers each year failed to increase their salaries; some of these suffered salary losses as large as 30 percent.

We next estimated a model in which a superintendent's salary change was also postulated to be a function of the lagged tax rate and math test score school district performance measures in the superintendent's base year school district, as well as the changes in the logarithms of county income, school district enrollment, and school district full value of property per student, from the base year to the new year school district. (For stayers, the latter three variables are simply the within district changes in the variables between the base and new years.) The coefficients of each of these change variables and the performance measures were allowed to differ between movers and stayers in this model.

The results of this analysis suggested that, other things held constant, movers suffered salary *losses* in the range of 5 to 6 percent relative to superintendents who did not change jobs. This occurred because among the other things held constant were school district income, enrollment, and wealth per student. In fact, the changes in each of these variables was positively associated with salary changes for movers (but *not* for stayers). Hence, in order for superintendents to have gained from mobility, they must have moved to either higher-income, larger, or wealthier school districts; this result is fully consistent with the cross-section salary equations presented in Table 12–5.

Focusing on the performance variables, the lagged math test performance variable coefficient suggested that superintendents who were "stayers" in school districts with above-average math test performance received larger salary increases than other superintendents who did not change jobs. In contrast, being employed in a district with above-average tax rate performance was positive but insignificantly associated with the salary increases of stayers.

What about the effects of performance on the salary changes of superintendents who changed jobs? Here the evidence was more mixed. Lagged tax performance in the superintendent's base year school district was positively associated with earnings gains for superintendents who change jobs, but lagged math test performance was negatively associated. We have no explanation for this latter finding, which is not consistent with the other results reported here and in the previous section.[13]

## HAVE SCHOOL SUPERINTENDENTS' ACTIONS INFLUENCED SCHOOL DISTRICT PERFORMANCE?

Our presumption is that school superintendents can affect our measures of school district performance and that the provision of appropriate financial incentives will encourage them to do so. One may wonder, however, whether superintendents' actions per se have had *any* influence on these school district performance measures in the past. A simple way to address this issue is to assume that a school district's estimated performance in a year depends only on the dis-

trict *and* the particular superintendent employed in the district in the previous year.[14]

Operationally, this is equivalent to specifying a regression model in which the dependent variable is an estimated performance measure for a school district in year $t$ and the explanatory variables are a set of dichotomous variables (one for each of the approximately 1,000 superintendents in the sample), each of which takes on the value 1 if the superintendent that it denotes worked in that school district in year $t-1$ and 0 otherwise, as well as a set of school district dichotomous variables (one for each of the approximately 700 school districts), each which takes on the value 1 if the school district it represents is that school district and 0 otherwise. If superintendents per se matter, at least some of the coefficients of the "superintendent variables" should prove to be nonzero.

To estimate such a model requires one to estimate an equation with approximately 1,700 coefficients, no simple computational task. However, if one takes the first difference and thereby obtains an equation for the change in performance in a school district between year $t$ and year $t-1$, all the school district variables and those superintendent variables that represent superintendents who never changed jobs during the period drop out of this model. This simplifies the estimation considerably, and when we estimated this latter model we found *no* evidence that knowledge of who the school superintendent was in a district in the previous year helped to predict the school district's tax rate or math test score performance measure in a given year (see Ehrenberg, Chaykowski, and Ehrenberg 1988 for details). Put another way, superintendents per se did not appear to influence our measures of school district performance.

A more complete analysis would experiment with a variety of different lags and use larger sample sizes (more years' data).[15] In addition, the weakness of our educational performance measures should be reemphasized. Data limitations restricted us both here and in the previous sections to focusing on the lower tail of the achievement distribution in mathematics for one elementary grade level. More complete measures would focus attention on the upper tail, on other subjects, on achievement measures for older students (test scores, drop-out rates, high school graduation rates, and college attendance rates) and on variables that are less easily measured (teaching students to think critically or instilling them with a sense of social responsibility). It is clear that our educational performance

measures are measured with considerable error; this may well cause us to understate both superintendents' effects on them and their effects on superintendents' salary changes and mobility.

## CONCLUDING REMARKS

Are school superintendents in New York State rewarded for their school districts' "good performance" by larger salary increases and/or greater opportunities for mobility to higher-paying positions? Although the evidence presented here is somewhat ambiguous, our tentative answer is yes. Higher scores on the tax rate performance index in the prior (lagged) year were associated with greater (smaller) probabilities that a superintendent will move to a better- (poorer-) paying job relative to the probability of staying in the same district and, for "movers," larger salary increases. Higher scores on the third-grade mathematics test index in the prior year were associated with larger salary increases for stayers. However, contrary to our expectations, this index was also negatively associated with salary increases for movers. It is this latter finding that gives us some pause as we draw conclusions.

Moreover, to say that the market for school superintendents is at least implicitly rewarding superintendents for their district's "good performance" is *not* to say that the implicit incentives to perform that superintendents face is sufficiently strong. Given the responses to our survey's question on the criteria that school boards use in their evaluation of superintendents (Table 12–6), our estimates suggest that these incentives are quite modest.

For example, our estimates suggest that a superintendent who remained in the same district while his district's math test performance index remained one standard deviation above the mean performance index (which is zero), would receive an annual salary increase that was only 0.3 percentage points higher, other things equal, than a "mean performer." If the district maintained this level of performance over a ten-year period, the superintendent's salary level at the end of the period would be only slightly more than three percentage points higher than that of the mean performer. Similarly, our results suggest that, among superintendents who moved to another position, those whose district's tax rate performance index was one standard deviation above the mean tax rate performance (which again is zero),

would receive a salary increase on moving that was only 1.7 percentage points higher, ceteris paribus, than the salary increase that a "mean performing mover" would receive. Neither of these magnitudes provides a strong incentive for superintendents to perform well.

On the other hand, our estimates suggest that a district's tax rate performance substantially influences its superintendent's prospects for mobility. Other things equal, a superintendent whose district's tax rate performance was one standard deviation above the mean would increase the ratio of his probability of moving to a better-paying job relative to the probability of staying in the same district by 40 percent and decrease the ratio of the probability of moving to a poorer-paying job relative to the probability of staying by 37 percent. These ratios, however, on average are very small (.038 and .016, respectively), so one may question whether even these mobility effects are of sufficient magnitude to provide the appropriate incentives for performance.

Indeed, taken at face value, the results discussed in the previous section suggest that superintendents per se do not appear to influence our measures of school district performance. One may interpret this finding in a number of ways. First, it is possible that the incentive effects estimated here are not sufficiently strong to provide adequate incentives for superintendents to try to influence these performance measures. Second, it is possible that school superintendents actually have little control over these measures (given the effective schools literature referred to in the introduction that stresses the important roles school administrators play, we doubt that this interpretation is correct). Third, as noted in the previous section, the limited number of years' data we had available and errors in the measurement of our educational performance measures may have caused us to understate both superintendents' effects on school district performance and the latter's effect on superintendents' salary changes and mobility. Resolution of which interpretation is correct will require additional research that is beyond the scope of our data set, although we have discussed throughout the chapter the form that some of these analyses might take.

Assuming that one agrees with the normative propositions that school districts should value high educational performance and effective fiscal management, the appropriate policy recommendations that

follow will depend on which interpretation proves correct. Our own inclination is to take the results of both our econometric research and our survey findings at face value (the first interpretation) and to suggest that local school boards build more incentives into school superintendents' compensation arrangements to encourage superintendents to improve educational and financial measures of school district performance.

## NOTES

1. Some case studies and statistical analyses of superintendents' turnover and mobility have been conducted; see Berger (1983), Knezevich (1971), and March and March (1977, 1978). Some comparative data on superintendents' salaries has also been published; see American Association of School Administrators (1979) and Knezevich. None of these, however, attempted to measure "performance" and to see if it matters; indeed, March and March (1977) argued that the mobility of superintendents is almost a random process. Their approach, however, was criticized by Schmittlein and Morrison (1981).
2. We must caution, however, that the "effective schools" literature has tended to focus on the role of building administrators (principals) and not on the role of school superintendents.
3. A district can simultaneously have high test scores and low tax rates, relative to "comparable" districts in the state, if the district's administrators efficiently manage both financial and educational (that is, staff) resources and effectively motivate school district personnel.
4. Unfortunately, no data on nonsalary compensation items are available on the BEDS tapes; we were limited to analyzing salaries rather than total compensation. Excluded from the sample each year were New York City (because the size of its school system and its large number of local district school boards make it noncomparable to any other district in the state), districts in which the superintendent's position was vacant, and districts that failed to report salary information.
5. These turnover data are consistent with what the superintendents themselves reported in Table 12-2.
6. Because less than half of the superintendents in the sample belonged to the professional association and the response rate of incumbents to the survey was about 70 percent, there was a substantial number of observations with missing data on some, or all, of the superintendents' characteristics. We also could not obtain school district characteristics data for some of the districts. As a result, we excluded observations from the sample if either

the school district's characteristics or the superintendent's degree information was missing. As Table 12-5 indicates, this reduces our sample sizes to between 550 and 600 observations each year.

7. We use *his* hereafter because over 97 percent of the approximately 1,010 superintendents who appear in our sample during the 1978-79 to 1982-83 period were males.
8. We isolate the sixth-grade mathematics test because it was the only one of the four tests that did *not* undergo revision during the period and that was given in all five years. As a result, while the entire battery of tests can be used to construct a performance measure when analyzing a single year's cross-section, subsequent sections' longitudinal analyses, which pool data across years, are restricted to using the single sixth-grade mathematics test.
9. These, unfortunately, were the only test score data that the New York State Education Department could provide us as they are the only tests that *all* students in the state are required to take. It obviously would have been preferable to have test scores for older students and also to focus some attention on the upper tail of the achievement distribution. For example, data on high school graduation rates or on the fraction of seniors going on to higher education would have been desirable. Our focus on the lower tail of the elementary school student test distribution imparts additional error to our educational performance measures, as does our ignoring other aspects of educational performance that are not easily measured (such as teaching students to write or instilling a sense of social responsibility in them).
10. A number of people have pointed out that in many communities businesses pay a substantial share of property taxes. Because only residents vote on school taxes, it would be desirable to include the share of property owned by residents in the total tax base as an additional explanatory variable in the tax rate equation. Discussions with officials in the New York State Education Department and Division of Equalization and Assessment indicated that (a) residential property data are *not* readily available at the school district level in New York State and (b) such data would not capture what we are after because some business property may be owned by residents and some residential (rental) property may be owned by nonresidents.
11. A similar "residual approach" to estimating performance was used in Goldstein and Ehrenberg (1976) in a different context.
12. See Ehrenberg, Chaykowski, and Ehrenberg (1986, 1988) for tables of statistical results that support the statements made in this and the next two sections.
13. As in the previous section, inclusion of the superintendent's salary in the base year as an additional explanatory variable did not alter any of the other coefficients. For the subset of school districts for which we had

teacher salary data, we also attempted to test if school superintendents' salary changes were related to the salary changes of teachers in their school districts. This variable, however, never proved statistically significant.

14. The one-year lag is assumed in the case of the tax rate measure because the tax rate in year $t$ is determined by the school board and superintendent in year $t-1$. Although test scores in year $t$ conceivably could depend on the superintendents' actions in year $t$, a year lag here also seems reasonable. Longer panels of data than we have would permit experimentation with a variety of lag lengths.
15. For example, we found similar results (school superintendents per se do not appear to influence school district performance) when we assumed that performance in period $t$ was a function of the superintendent in period $t-2$.

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