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Merit Pay for School Superintendents?

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Abstract

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This paper provides evidence on whether school superintendents are explicitly or implicitly rewarded for their "performance" by higher compensation and/or greater opportunities for mobility. We analyze panel data from over 700 school districts in New York State during the 1978-79 to 1982-83 period. Measures of performance are defined and then entered into salary level, salary change, and mobility equations. While evidence is provided that school superintendents are rewarded for "performance", the magnitude of the rewards appear to be quite small.

Keywords

school administrators, performance, compensation, merit pay, New York State

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Comments

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ABSTRACT

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This paper provides evidence on whether school superintendents are explicitly or implicitly rewarded for their "performance" by higher compensation and/or greater opportunities for mobility. We analyze panel data from over 700 school districts in New York State during the 1978-79 to 1982-83 period. Measures of performance are defined and then entered into salary level, salary change, and mobility equations. While evidence is provided that school superintendents are rewarded for "performance", the magnitude of the rewards appear to be quite small.

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I. Introduction

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; this in spite of the fact that historically merit pay plans have not met with much success in public education, at least partially because there are characteristics of public education that make their implementation problematic.[1]

Somewhat surprisingly, less attention has been directed to the important role that educational administrators (school principals and superintendents) play in the educational process and their methods of compensation. Given their key 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' "performance" to be of fundamental importance in determining both how much students learn and the cost of public education to taxpayers.[2] Yet there has been little public call for formal merit pay plans for school administrators. This is somewhat 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 covering all employees.[3]

In fact, while there is a voluminous literature on the determinants of teachers' salaries, we know little about the forces that influence the compensation of school administrators.[4] In particular, we have little evidence about whether they are explicitly or implicitly rewarded for their "performance" by higher compensation and/or greater opportunities for mobility to higher paying positions.[5] Such evidence is clearly important for policy debate; unless there is evidence that school administrators' compensation is at least implicitly tied to their "performance", a case can be made that consideration should be given to building incentives for performance explicitly into their compensation arrangements.

To shed evidence on these issues, this paper presents analyses of the compensation and mobility of school superintendents in New York State during the 1978-79 to 1982-83 period.[6] Our analyses are based on a unique longitudinal data base we have assembled that include the salary and name of the school superintendent in each school district in the state (over 700) each year during the five-year period. Coupled with data from a variety of other sources, these data enable us to estimate the extent to which, across districts at a point in time, a superintendent's salary is related to characteristics of the school district (e.g., community wealth and adult educational attainment), characteristics of the superintendent (e.g., educational attainment and experience), and measures of the superintendent's "performance". Similarly, they enable us to estimate the extent to which superintendents' salary changes and probabilities of mobility, are related to "performance".

Of course, a crucial element in our study is the definition of "performance". While school districts and their school board members are idiosyncratic and, as we demonstrate below, 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.[7] Specifically, we define performance by contrasting actual student test scores and the tax rate for each district in a year to predicted values obtained from regression equations in which each outcome is specified to be a function of characteristics of the district (e.g., income level, wealth, adult education levels, racial mix). Such a methodology proved useful in a previous study conducted by one of us that dealt with the compensation of city-managers, police chiefs and fire chiefs.[8]

We begin in the next section by presenting background data on the salaries and mobility of school superintendents in New York State, along with estimates of cross-section superintendent salary equations that exclude performance measures. Based upon a survey we conducted of all school superintendents in New York State, section III discusses the criteria superintendents believe are used in their evaluations and, with these results in mind, discusses the performance measures actually used in this study. Section IV then presents our estimates of the effects of performance in one year on the next year's salary level for superintendents who remain in the same district, as well as our estimates of the effects of performance and changes in performance on the salary changes of superintendents who remain in the same district or move to another school district in the state. The next section presents estimates of the relationship between the mobility of school superintendents and their performance. Finally, Section VI presents some brief concluding remarks.

II. Salaries and Mobility of School Superintendents in New York State, 1978-79 to 1982-83: Some Preliminary Analyses

Descriptive statistics are presented in Table 1 on school superintendents' salaries in New York State during the five academic year period that our data cover. There are over 700 public school districts in New York State and excluded from the data each year are New York City, districts in which the position is vacant, and districts that failed to report salary information. 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 equalling 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.

Background data on the mobility of school superintendents in the state is found in Table 2. From our data, we can 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, may have moved to a different educational position (nonsuperintendent) in another district in the state, or may have switched to a noneducational position. Alternatively, his school district may simply have failed to report data in the second year.

The data in Table 2 suggest that the annual turnover rates of school superintendents are low, as each year between 81 and 88 percent of the superintendents continued in their current job. 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 each year. In Section V we attempt to explain, using multinomial logit analyses, the determinants of which of these three "states" a superintendent is in each year. Since our data do not permit us to distinguish among the variety of reasons that an individual winds up in the "out of sample" state, not surprisingly our ability to "explain" why individuals wind up in it is limited.[9]

Ignoring "performance" for a moment, what are the forces one might expect to influence a superintendent's salary? On the one hand, one might expect that the characteristics of the school district should matter as larger districts (where a superintendent's job is more difficult), wealthier districts (who can afford to pay more), 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), are all likely to pay higher salaries in an effort to attract and retain high quality superintendents. On the other hand, characteristics of the superintendent should also matter, as more experienced and more highly educated superintendents are likely to be able to command higher salaries.

Table 3 reports our attempts to see if these forces do matter. Estimates of annual cross-section salary equations of the form

$$(1) \quad \log(W_i) = a_0 + a_1 X_i + a_2 S_i + \varepsilon_i,$$

where W is the annual salary of the superintendent, X is a vector of school district characteristics, S is a vector of characteristics of the superintendent, and ε 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 <u>Who's Who in Educational Administration</u>, the directory of members of the American Association of School Administrators, and the responses to a survey of all school superintendents employed in New York State in 1984-85, that was conducted by the authors in late May to early July of 1985. Because less than half of the superintendents in the sample belonged to the professional association and the response rate of incumbents in 1984-85 to the survey (and a follow-up for nonrespondent) 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.[10] As Table 3 indicates, this reduces our sample sizes to between 550 and 600 observations each year.

As expected, the characteristics of school districts prove to be important determinants of superintendents' salaries. Ceteris paribus, in each year larger districts (as measured by the logarithm of total enrollment (X_1)), wealthier districts (as measured by the logarithms of property values per enrolled student (X_2)), per capita personal income in the county (X_3), or census year (1979) median family income in the school district (X_4)), 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 (X_6)) all are associated with higher superintendents' salaries.

In contrast, only two of the superintendents' characteristics, years of tenure in the current district (S_4) and years since receiving a bachelor's degree (S_5) -- the latter a rough proxy for age -- prove to be statistically significant. Moreover, quantitatively 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 of age being roughly 0.2 percent. Somewhat surprisingly, neither the possession of a doctorate degree (S_1) or a certificate of advanced study in administration (S_2) -- the latter an intermediate degree between a masters and a doctorate -- nor the total number of years of previous experience as a superintendent in other school districts, systematically are associated with salary.[11]

Of course, it is well-known, and the results of our survey confirm, 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 characteristics 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 each regressed on the personal characteristics of the superintendent (excluding years of tenure in the current district). The results are reported for each year in Table 4. Having a doctorate degree, having more prior experience as a superintendent in other districts, and being older, all are associated with employment in larger school districts, while having a doctorate degree also is associated with being employed in wealthier districts.

These latter findings have important implications for the analyses that follow of the relationship between compensation and performance. For even if within a given school district one was to find no relationship between a superintendent's compensation and his performance, superintendents might still be rewarded for performance by increased opportunities for mobility to better paying positions.

III. Evaluating the "Performance" of School Superintendents

We measure the performance of a school superintendent in this paper by his success in keeping school tax rates low and educational test scores high in his district, both relative to these outcomes in "comparable" districts in the state. It is natural to ask how these measures correspond to the criteria that superintendents believe school boards actually use? To answer this question, the survey of school superintendents that we conducted asked the respondents to list the criteria they believed their school boards used in their evaluation.[12] In cases where a formal evaluation instrument existed, the superintendent was asked to attach it to his response.[13]

Approximately 80 percent of the respondents to our survey (397 of 496) included a list of criteria in their response 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 5; since most superintendents mentioned more than one category, the total count across categories far exceeds the number of respondents.

Most striking, and somewhat depressing (at least to us!), the most commonly mentioned criteria were community/public relations and school board relations. Fiscal management (the category that would include 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.

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 towards zero in the compensation and mobility equations. 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 6 presents estimates of tax rate and educational outcome equations for 1979-80 (separate equations 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. 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 percentage who fell below the state reference point on standardized third and sixth grade reading and mathematics examinations.[14] Students who fall below the state reference point are deemed to require remedial services and state aid is increased to help fund these services. Since these outcome scores measure the proportion who "fail" these tests, we are focusing on the bottom tail of the academic achievement distribution.[15]

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

$$(2)\ \log 0_j = b_{0j} + b_{1j}Z + U_j \qquad j = 1,2,3$$

where Z is a vector of school district characteristics expected to influence these outcomes and U is a random error term. In fact, the variables in Z are assumed to be identical to those that enter the superintendent salary equation (X), save that a (1,0) "city school district" dummy variable replaces the continuous size of district variable. In the large city school districts in New York State the property tax rate is set by an elected school board (subject to constitutional limitations), while in the smaller school districts the tax rate is 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 6 conform to our expectations and provide reasonable explanations of the tax rates and test scores. For example, with respect to tax rates, wealthier (X_2) districts have lower tax rates, presumably because lower rates are required to raise any given level of revenue, richer in terms of current income (X_4) districts have higher tax rates, districts with higher proportions of nonwhites (X_5), and thus special needs, have higher tax rates, and districts with higher proportions of adults with more than a college education (X_6), and presumably greater taste for education, have higher tax rates.

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. While it would be preferable to use the former in our analysis, as noted above (footnote 14) 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 (2)), one can obtain estimated values of the logarithm of each outcome for each school district (i) from

$$(3)\quad \widehat{\log}\, O_{ji} = \hat{b}_{0j} + \hat{b}_{1j} Z_i \qquad j = 1,2,\ldots 3.$$

The school district (='s superintendent's) performance is then defined as the difference between the predicted and actual values of the log of each outcome.

$$(4)\quad P_{ji} = \widehat{\log}\, O_{ji} - \log O_{ji} \qquad j = 1,2,\ldots 3.$$

Positive values of P_{ji} indicate positive performance for the superintendent, 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 (2) (3) and (4) are estimated separately each year. Thus, the structural 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. This allows us to focus on the effects of changes in performance on changes in salaries and mobility in places below.

IV. Salary Levels, Salary Changes, and Performance

We begin our analyses of the relationship between superintendents' performance and salaries by focusing on individuals who remained in the same position for two consecutive years, asking if estimates of their performance in the first year influenced their salary levels in the second year.[16] Specifically, we estimate equations of the form

$$(5)\ \log W_{it} = a_{0t} + a_{1t}X_{it} + a_{2t}S_{it} + a_{3t}T_{it-1} + a_4E_{it-1} + \varepsilon_{it}$$

where T_{it-1} is our measure of the "tax performance" of the superintendent in period t-1, E_{it-1} is our measure of the "educational test score performance" (either the sixth grade math test or the average of all the tests) of the superintendent in period t-1, and all other variables are defined as before (see Table 3). Equation (5) is estimated separately for each of the last four academic years in our sample (t = 1979-80, 1980-81, 1981-82, and 1982-83) and for the four years data pooled together; in the latter case, separate intercept terms for each year are included in the model.[17] Given our definitions of performance, the coefficients a_3 and a_4 are expected to be positive.

Table 7 presents the estimated coefficients of the performance variables from these models; the coefficients of the other explanatory variables are virtually identical to the coefficients that appear in Table 3. Taken together, especially when one focuses on the pooled results, these coefficients suggest that while higher educational performance is associated with higher superintendents' salaries as expected, higher tax performance is associated with lower superintendents' salaries for this sample of stayers. How can one reconcile these apparently contradictory findings?

On the one hand, one might argue that the labor market for superintendents is not operating totally in the manner that we expected. On the other hand, and we prefer this explanation, one might argue that our model may be imperfectly specified and that some important explanatory variable that belongs in the vector X has been omitted from the model. That is, our estimates are subject to omitted variable bias.

To see this, suppose there is some unobserved variable, which we denote by V_{it}, that measures the intensity of a community's feelings about the importance of education and the willingness of the community to pay a high salary to attract a first-rate superintendent, and that this variable is not fully controlled for by the X's in our model. Hence, the "correct" model should be

$$(6)\ \log W_{it} = \alpha_{0t} + \alpha_{1t}X_{it} + \alpha_{2t}S_{it} + \alpha_{3t}T_{it-1} + \alpha_{4t}E_{it-1} + V_{it} + \varepsilon_{it}$$

Districts with high values of V are also likely to tax themselves at higher rates to support education than other districts, ceteris paribus. As a result, our estimated tax performance measure will be low in these districts and the partial correlation between T and V will be negative. Similarly, districts with high values of V, where more resources than predicted are devoted to education, are also likely, ceteris paribus, to be districts in which student test scores are high and fewer students fall below the state norm on the standardized tests. As a result, our estimated test score performance measures will be high in these districts and the partial correlations between E and V will be positive. It is straightforward to show that if one estimates (5) rather than (6), omitting V_{it}, the tax performance coefficient will be biased in a negative direction and the educational performance coefficients biased in a positive direction.[18] One can thus not be sure how to interpret the coefficients in Table 7.[19]

Of course, if one is willing to assume that the V_{it} do not vary over time in a given district ($V_{it}=V_i$), an innocuous assumption given the short time span of our data, equation (6) becomes a fixed-effects type of model.[20] At first glance, an apparent solution to the omitted variable bias that may be present, is to treat all parameters (save for the intercept terms) as constant and first-difference to obtain.

$$(7)\ \log(W_{it}/W_{it-1}) = \alpha_{0t} + \alpha_1(X_{it}-X_{it-1}) + \alpha_2(S_{it}-S_{it-1}) + \alpha_3(T_{it-1}-T_{it-2}) + \alpha_4(E_{it-1}-E_{it-2}) + (\varepsilon_{it}-\varepsilon_{it-1}).$$

Equation (7) can be estimated directly and, since V_i does not appear in it, unbiased estimates of α_3 and α_4 obtained. That is, one can estimate the extent to which changes in performance are associated with changes in salary.

Unfortunately, matters are not always as simple as might appear at first glance; equation (7) must be modified for two reasons. First, as noted in Table 2, each year some superintendents move to new jobs within New York State and others drop out of the sample. Since we have subsequent earnings data for the former, we can include them in the analyses and allow the effects of all of the right-hand side variables in the model to differ for movers and stayers; this will enable us to estimate the effect of mobility within the sample per se on earnings growth.[21] However, we must stress that selectivity problems abound here, whether a superintendent moves to another district in the state or drops out of our sample presumably are not random events. To econometrically model this joint wage-change-job-change-leave-the-sample process would be extraordinarily complex, especially so since both school boards and superintendents are involved in the decision process. In the remainder of this section, for empirical tractability we ignore sample drop-outs and treat within-sample mobility as exogenous, while in the next section we analyze mobility directly.

Second, if equation (6) is indeed the true model, then changes in salary should be related to changes in performance, as in (7). However, it is not obvious that the specification in (6) is correct, for it is conceivable that school districts may want to reward superintendents for keeping performance high, even if it is not improving. So, for example, as long as educational test scores in a district are 10 percent above their predicted value, the superintendent might receive an above average salary increase, even if he simply is maintaining the existing differential. Because of this, in what follows we also estimate models that include performance levels as explanatory variables, as well as those that include performance changes.

Table 8 presents estimates of several salary change equations for superintendents who remained in the sample over two consecutive years. Column (1) presents the simplest model; salary change is postulated there to be a function only of year dummy variables and a dichotomous variable for whether the superintendent changed jobs (1=yes, 0=no) during the period.[22] The results in this column suggest 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 approximately one-fifth of the movers each year failed to increase their salaries; some of these suffered salary losses as large as 30 percent.

Columns (2)-(4) present the results of estimating variants of equation (7). Each specification includes the changes in the logarithms of income, enrollment, and full value of property per student in the district, as well as the tax and educational performance measures.[23] The coefficient of each of these variables is allowed to differ between movers and stayers. As discussed in Section III, since we are now exploiting the longitudinal nature of the data, the only educational performance measure that can be used is that based on the sixth grade math test; this was the only test that did not change during the five-year period.

Three different forms of the performance measures are used. In the specification in column (2) we use the change in performance measures. So, for example, if we are looking at the salary change from 1979-80 to 1980-81, the relevant performance change measures would be those from 1978-79 to 1979-80. Columns (3) and (4) use level of performance measures. The former uses the base year performance measures; in our example, 1979-80. The latter uses a lagged year performance measure; in our example, 1978-79.

Turning to the results, in <u>these</u> specifications, ceteris paribus, movers suffer salary losses in the range of 5 to 6 percent relative to superintendents who don't change jobs. This occurs because among the other things held constant here are school district income, enrollment, and wealth per student. In fact, the changes in each of these variables is positively associated with salary changes for movers (but <u>not</u> for stayers). Hence, in order for superintendents to gain from mobility, they must move to either higher income, larger, or wealthier school districts.[24]

At first glance, column (2) suggests that the change in math performance is perversely negatively associated with the superintendent's salary change for stayers. However, when the base year and lagged year math performance index are included as separate variables (not reported here) both prove to be statistically insignificant. Moreover, columns (3) and (4) suggest that the negative association between salary change and math test performance change occurs primarily because the <u>lagged</u> level of math performance is positively associated with the salary change. To show that the lagged level is indeed the relevant variable that should enter into the salary change equation, a discussion of the timing of these variables is in order.

Returning to our example, suppose again that we are trying to explain the determinants of the 1979-80 to 1980-81 salary change for a superintendent. The base year math test (for 1979-

80) was given in the spring of 1980 and the district might have received its own test results back shortly thereafter. There is very little chance, however, 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 have come too late to be used in the process of deciding the superintendent's salary for 1980-81; presumably such a decision would have to have been made prior to the fall of 1980. So, in fact, neither the base year level of the math performance measure, nor the change in the performance measure (as we have defined it) could logically have been used in making the salary change decision. The lagged math performance measure is, in a temporal sense, a logically correct variable to use and it is positively associated with salary changes for superintendents who do not change jobs.

What about the effects of performance on the salary changes of superintendents who change jobs? Here the evidence is a bit more mixed. The derived estimates (from the stayer and interaction coefficients) of the effects of performance on movers' salary changes are found in the notes to Table 8. Following the same reasoning as above, it is the lagged performance level variables that logically might effect salary changes. However, while lagged tax performance is positively associated with earnings gains for superintendents who change jobs, lagged math test performance is negatively associated.

V. Performance and Mobility

As Table 2 indicates, each year roughly 5 percent of the superintendents in our sample moved to another school district in New York State, while roughly 10 percent dropped out of the sample. Among the former group, approximately 80 percent received salary increases, while 20 percent received the same salary after moving or suffered wage cuts. Finally, approximately 85 percent of the sample continued in their same positions. What determines in which of the four states (move to another district with $\dot{S}>0$, move to another district with $\dot{S}\leq 0$, leave the sample, or stay in the same position) each observation is located?

To answer this question, we estimated models of the form

$$(8)\quad \log\left(\frac{P(\text{state}=j)}{P(\text{state}=4)}\right) = d_{0j} + d_{1j}Y + d_{2j}S + d_{3j}T + d_{4j}E + \varepsilon_j \qquad j = 1,2,3$$

where Y is a vector of characteristics of the school district (a subset of the X), 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(state=j) denotes the probability that an individual is in state j, with the four states being change districts with a salary increase, change districts with no salary increase or a salary decrease, leave the sample, and continue on in the same district, respectively. Under suitable assumptions about the distribution of the error terms (lognormal) the system in (8) represents a multinomial logit model and can be estimated by standard maximum likelihood methods.[25]

Table 9 presents the estimates of one specification of equation (8) (that uses the lagged level performance measures), both for the 4-way dichotomy that includes people who left the sample and the 3-way dichotomy that excludes this group. The table indicates that the vectors of parameters that determine the logarithm of the ratios of the odds of being in the other three groups is virtually identical for the two models; this is to be expected given the "irrelevance of alternative option" property of the multinomial logit model.

Quite striking, the lagged tax level performance measure is 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. Put another way, among movers the better lagged tax level performance is, the more likely the individual will move to a better job. On-the-job financial performance does affect school superintendents' futures. The math performance variable, however, is always insignificant, perhaps because of the reasons discussed in Section III.

As suggested from the cross-section results found in Table 4, having a doctorate degree increases a superintendent's chances of moving to a better paying job relative to his chances of not moving. Older superintendents are 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 are more likely to move to both higher <u>or</u> lower paying jobs relative to staying in the same district: this may well reflect heterogeneity of turnover probabilities.[27] Finally, being employed in a school district with high median family income reduces the probability of moving to a higher paying job relative to the probability of staying. As indicated in Table 3, 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 his base year salary, his residual from a base year log salary equation that included only superintendents' characteristics, his residual from a base year log salary equation that included both superintendents' and school district characteristics, and his residual from a comprehensive base year log salary equation that also included performance measures. However, 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 coefficients in Table 9.

Finally, Table 10 indicates the sensitivity of our mobility results to the specification of the performance variables. As in the salary change equations, four specifications were tested: base year level, lagged year level, both base and lagged year levels, and change in performance. The coefficients in this table 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.[28]

VI. Concluding Remarks

Are school superintendents rewarded for "good performance" by larger salary increases and/or greater opportunities for mobility to higher paying positions? Although the evidence we have presented is not totally unambiguous, our tentative answer is yes. Higher scores on the tax rate performance index in the prior year are 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 are associated with larger salary increases for stayers. However, contrary to our expectations, this index is also negatively associated with salary increases for movers. It is this latter finding that gives us some pause as we draw conclusions.[29]

Of course, as noted above, there are many problems with our educational performance index. It is based on a single subject and grade level test and focuses on the lower tail of the academic achievement distribution. This causes us to put more weight on the tax rate findings, but also suggests that future researchers might profitably examine a wider range of educational outcome measures than we have.

Moreover, to say that the market for school superintendents is implicitly behaving "as if" there were merit pay for school superintendents 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 school boards use in their evaluation of superintendents (Table 3), our priors would lead us to be surprised if they were. Indeed, our own estimates do suggest that these incentives are quite modest.

For example, the estimated coefficients in Table 8 suggest that a superintendent who remained in the same district and kept his district's math test performance index 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, ceteris paribus, than a "mean performer".[30] If the superintendent maintained this level of performance over a ten-year period he would find his salary level at the end of the period only slightly more than 3 percentage points higher, ceteris paribus, than that of the mean performer. Similarly, they 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 upon moving that was only 1.7 percentage points higher, ceteris paribus, than the salary increase that a "mean performing mover" would receive.[31] Neither of these magnitudes would appear to provide a strong incentive for superintendents to perform well.

On the other hand, the coefficients in Table 9 do suggest that tax rate performance does substantially influence mobility prospects. Ceteris paribus, 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 his probability of staying in the same district by 40 percent and decrease the ratio of the probability of his moving to a poorer paying job relative to the probability of staying by 37 percent.[32] These ratios, however, on average are very small -- .038 (46/1207) and .016 (19/1207) -- so one may question whether even these mobility effects are of sufficient magnitude to provide the appropriate incentives for performance. As such, some education of school board members on the potential gains from using formal merit pay plans that focus on desired educational and financial outcomes, rather than on public relations type measures, may well be in order.

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Footnotes

1. See, for example, Samuel Bacharach, David Lipsky, and Joseph Shedd (1984) and Richard Murnane (1984) for discussions of the difficulties involved with merit pay plans for teachers. Among the problems they highlight are the often zero-sum nature of such plans (a fixed sum to divide among teachers), the difficulties of measuring individual teacher performance, and the historic opposition of teachers' unions to merit pay.

2. Studies of "effective schools" (where students "performance" exceed one's expectations, given the characteristics of the students, their environment, and the resources devoted to their education) point to the important instructional leadership role of the principal. For discussions of the effective school literature, see S. Bossert, et al. (1982), David Kroeze (1982), and Phillip Hallinger and Joseph Murphy (1982).

3. See George Milkovich and Jerry Newman (1984). Individual incentive plans should be distinguished from group incentive plans, such as profit-sharing plans, that tend to cover a wider range of employees. The latter have become more prevalent in recent years as a substitute for wage increases in industries facing serious economic problems.

There is, of course, a large theoretical literature on the importance of structuring private sector corporate executives compensation so that they have incentives to perform in the best interest of shareholders (i.e., to solve the principal-agent problem). A substantial empirical literature, see for example Michael Jensen and Jerold Zimmerman (1985), who summarize a symposium in the May 1985 issue of the Journal of Accounting and Economics, addresses whether such a nexus appears to exist in the private sector. Our work is in the spirit of these latter studies. Somewhat surprisingly, however, there is only a very limited empirical literature on whether private sector corporations that tie executive compensation to "performance" actually "outperform" other firms. Robert Masson (1971) is an example of this literature.

4. For surveys of the teachers' salary literature, see Ronald Ehrenberg and Joshua Schwarz (1986) and David Lipsky (1982).

5. Some case studies and statistical analyses of superintendents' turnover and mobility have been conducted; see, for example, Michael Berger (1983), Steven Knezevich (1971), and James C. March and James G. March (1977, 1978). Some comparative data on superintendents' salaries has also been published; see, for example, 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 David Schmittlein and Donald Morrison (1981).

6. Our focus is on school superintendents because they are the chief operating officers of school districts and their

salaries are determined through individual "negotiations" with school boards. In contrast, especially in larger districts, school principals tend to be members of a union and their salary increases negotiated collectively; this limits the likelihood of observing individual principals' salaries being related to their performance.

7. 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 (i.e., staff) resources and effectively motivate school district personnel.

8. Gerald Goldstein and Ronald Ehrenberg (1976).

9. Previous studies suggest that the vast majority of superintendents, possibly as high as 90 percent, serve in only one state during their lifetime (Knezevich (1971)). Thus, it may be reasonable to assume that the number in this last category who move out of state in our sample is small.

10. As noted in the table, between 20 to 65 percent of the observations were missing at least one of the other superintendents' characteristic variables. To omit these observations would have decimated our sample. Instead, dummy variables for nonreporting of each of these variables were included in the analyses and variables that were not reported were assigned the value of zero. See G. S. Maddala (1977) for a discussion of estimation when observations on some variables are missing.

11. We say "his" throughout because over 97 percent of the approximately 1,010 superintendents who appear in our sample anytime during the five-year period were males. Squared values of S_3, S_4, and S_5 (which a pure "human capitalist" might asert belong in the analyses) never proved significant, primarily we suspect because of the small age range over which S_5 varied (most superintendents are over 40) and the large number of observations for which S_3 and S_4 were not reported.

12. We stress these are the superintendents' perceptions; school board members might respond differently.

13. We are grateful to Dr. Gordon Bruno, Superintendent of the Ithaca, NY City School District, for suggesting we include this request in our survey.

14. We isolate the third 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 third grade mathematics test.

15. These, unfortunately, were the only test score data that the New York State Education Department could provide us. 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 (e.g., teaching students to write, or instilling a sense of social responsibility in them).

16. This restriction to "stayers" leads to obvious selectivity problems (see James Heckman (1979)) as it ignores the return to performance that comes from increased opportunity for mobility. This issue is addressed in the next section.

17. Data from the first academic year in the sample, 1978-79, is used only to construct the lagged performance measures for 1979-80.

18. If some of the included variables are proxies for the omitted ones and if these included ones are correlated with our performance measures, other (measurement error) problems may arise and the bias cannot always be signed. On this, see Zvi Griliches (1977).

19. A similar criticism applies, of course, to the earlier work of Goldstein and Ehrenberg (1976).

20. See Jerry Hausman (1978) for a discussion of the fixed-effects model.

21. Strictly speaking, at first glance first-differencing may appear to eliminate the fixed effect only for stayers. Letting j be the district superintendent i is in in period

t-1 (and prior) and k be the district he is in in period t, the generalization of (7) for movers would be

$$\log (W_{ikt}/W_{ijt-1}) = \alpha_{0t} + \alpha_1(X_{kt}-X_{jt-1}) + \alpha_2(S_{it}-S_{it-1}) + \alpha_3(T_{ijt-1}-T_{ijt-2}) + \alpha_4(E_{ijt-1}-E_{ijt-2}) + (V_k-V_j) + (\varepsilon_{1t}-\varepsilon_{1t-1})$$

However, since presumably $P(V_j,T_{ijt-1}) = P(V_j,T_{ijt-2})$ and $P(V_j.E_{ijt-1}) = P(V_j,E_{ijt-2})$, first-differencing should eliminate omitted varaible bias for movers as well.

22. The other district and superintendent characteristics (in X and S) rarely changed, save for movers. and they are excluded here to avoid severe collinearity problems.

23. As above, inclusion of the superintendent's salary in the base year 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.

24. These results are fully consistent with the cross-section salary equations found in Table 3.

25. See Madalla (1983).

26. See. especially. footnote 15.

27. For discussions of methods to try to distinguish heterogeneity bias from other factors (i.e., state dependence),

see Chamberlain (1981) and Heckman (1981). Since this issue is not of central importance to us, we do not pur ie these methods here.

28. As Table 10 indicates, when the change in tax performance specification is generalized and the base year and lagged year level entered separately, only the latter matters.

29. An additional concern is that the productivity-salary change-mobility relationships that we observe may reflect learning over time about superintendents' true productivity, and then attempts to compensate them for this true productivity rather than any incentive driven relationships. Kevin Murphy (forthcoming) has proposed tests (in the context of corporate executives compensation) to distinguish between the "incentive" and "learning" explanations. His tests require good data on prior experience and job tenure (both are often missing in our sample).

30. This is computed as the stayer coefficient for the lagged math performance variable (.007) multiplied by the standard deviation of the math performance variable (.46).

31. This is computed as the implied mover coefficient for the lagged tax rate performance variable (.075) multiplied by the standard deviation of the tax rate performance variable (.23).

32. These are calculated as exp((1.466)(.23)) minus one and exp((-2.006)(.23)) minus one, respectively.

Table 1

School Superintendents' Salaries in New York State:
1978-79 to 1982-83

Year	Number of Districts Reporting	Mean	Std. Dev.	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

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.

Table 2

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%)

where

(A) - number of superintendents in the sample in the first year

(B) - number (percent) of superintendents in the first year who were in the same district in the second year

(C) - number (percent) of superintendents in the first year who moved to another district in the state in the second year

(D) - number (percent) of superintendents in the first year who were not employed in any district in the sample in the second year

Source: Authors' calculations from data on the New York State Education Department's "Basic Educational Data System" (BEDS) School District Tapes.

Table 3

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

Exp.[a]/Acad. Var./Year	Logarithm of Annual Salary (SAL) 1978-79	1979-80	1980-81	1981-82	1982-83
X_1	.127(22.5)	.113(20.0)	.117(21.2)	.111(20.7)	.110(20.0)
X_2	.045 (5.8)	.025 (4.1)	.028 (4.8)	.019 (3.9)	.011 (2.3)
X_3	.191 (5.2)	.228 (6.5)	.228 (6.3)	.273 (8.4)	.294 (9.3)
X_4	.151 (3.6)	.146 (3.4)	.189 (4.3)	.152 (3.6)	.120 (2.9)
X_5	.178 (2.6)	.072 (1.2)	.032 (0.4)	-.071 (1.0)	-.111 (1.7)
X_6	.357 (2.5)	.449 (3.0)	.367 (2.5)	.445 (3.1)	.494 (3.4)
X_7	.200 (2.0)	.009 (0.0)	.027 (0.3)	-.001 (0.0)	.074 (0.8)
X_8	-.073 (1.0)	.022 (0.3)	-.049 (0.7)	-.036 (0.5)	-.080 (1.0)
X_9	.185 (1.8)	-.147 (1.3)	.105 (1.1)	.224 (2.2)	.218 (2.1)
X_{10}	.014 (1.0)	.025 (1.6)	.000 (0.0)	-.019 (1.2)	-.012 (0.9)
S_1	-.008 (0.7)	.006 (0.6)	.010 (1.0)	.013 (1.4)	.023 (2.3)
S_2	.000 (0.0)	-.016 (1.4)	-.014 (1.3)	-.032 (3.1)	-.016 (1.7)
S_3	.002 (1.1)	-.000 (0.3)	.001 (0.6)	-.000 (0.1)	-.000 (0.2)
S_4	.006 (5.3)	.006 (5.0)	.006 (5.5)	.004 (3.6)	.007 (5.7)
S_5	.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

[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 available for 35 to 65% of the sample each year, while year since degree was typically available for 70 to 80% of the sample.

Table 3 (continued)

where

X_1 = logarithm of total enrollment in the district in the year

X_2 = logarithm of the full value of property in the district per enrolled student in the year

X_3 = logarithm of per capita personal income in the county in the year

X_4 = logarithm of median family income in the district in 1979

X_5 = 1979 percentage of the district's population that was nonwhite

X_6 = 1979 percentage of the district's adult population with greater than a college education

X_7 = 1979 percentage of the district's households with children at home

X_8 = 1979 percentage owner-occupied housing in the district

X_9 = 1979 percentage of the district's adult population with some college or a college degree

X_{10} = 1979 percentage of the district's population residing in urban areas

S_1 = 1=superintendent had a doctoral degree in the year, 0=no such degree in year

S_2 = 1=superintendent had a certificate of advanced study in the year, 0=no such degree

S_3 = superintendent's total number of years experience in other school districts as a superintendent

S_4 = superintendent's years of tenure in the current district

S_5 = superintendent's years since receiving a bachelor's degree

Sources:

Authors' computations from:

1) Sal, X_1, X_2 - 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) X_3 - U.S. Department of Commerce, Bureau of Economic Analysis, unpublished tabulations for 1978 to 1982.

3) X_4 to X_{10} - U.S. Bureau of the Census, 1980 Census of Population, School District Data File for New York State.

4) S_1 to S_4 - 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.

Table 4

School Superintendents' Characteristics and the Size and Wealth of the District in Which They Are Employed[a]
(absolute value of t statistics)

Acad. Var./Year	Logarithm of Per Student Full Value 1978-79	1979-80	1980-81	1981-82	1982-83
S_1	.113 (1.7)	.115 (1.4)	.144 (1.8)	.147 (1.6)	.205 (2.3)
S_2	.016 (0.2)	.153 (1.5)	.096 (1.0)	.208 (2.0)	.118 (1.2)
S_3	-.006 (0.6)	-.001 (0.0)	.003 (0.3)	.007 (0.6)	.006 (0.6)
S_5	.010 (1.8)	.011 (1.7)	.005 (0.9)	.010 (1.3)	.004 (0.6)
$\bar{R}^2$	.016	.006	.010	.024	.025
n	596	563	565	576	579

	Logarithm of Total Enrollment 1978-79	1979-80	1980-81	1981-82	1982-83
S_1	.738 (8.0)	.733 (7.9)	.741 (8.0)	.702 (7.8)	.720 (8.1)
S_2	.033 (0.3)	.005 (0.0)	.019 (0.2)	.115 (1.1)	.072 (0.8)
S_3	.021 (1.6)	.017 (1.3)	.008 (0.7)	.016 (1.5)	.016 (1.6)
S_5	.033 (4.4)	.035 (4.6)	.033 (4.5)	.035 (5.0)	.034 (4.8)
$\bar{R}^2$	.180	.190	.177	.190	.199
n	596	563	565	576	579

[a]Also included in the analyses are an intercept term and dummy variables for nonreporting of year of bachelor's degree and years of experience as a superintendent prior to current job. All variables are defined as in Table 3.

Table 5

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

Responses	Number
1) Overall Response to the Survey	496
2) Response to Question on Criteria Used in Evaluation	397
3) Mentioned that Criteria Included:	
a) Community/Pubic Relations	318
b) School Board Relations	294
c) Staff and Personnel Management	287
d) Fiscal Management	267
e) Curriculum Development, Educational Planning and Leadership	202
f) Professional and Personal Development	132
g) General Management and Administration	129
h) Academic Performance and Achievement	125
i) Facilities Management	50
j) Student Services and Relations	49
k) Student Discipline	26
l) Parent Relations	25
4) 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. Response rates did not vary substantially across size classes of school districts.

Table 6

1979-80 Tax Rate and Educational Outcome Equations
(absolute value of t statistics)

Explanatory/ Variables / Outcome	log(T)	log(GM)	log(AS)
X_2	-.100 (7.0)	-.036 (1.2)	-.033 (1.6)
X_3	-.001 (0.0)	-.243 (1.3)	-.029 (0.2)
X_4	.180 (1.8)	-.253 (1.2)	-.397 (2.8)
X_5	.691 (4.6)	1.351 (4.2)	1.111 (5.2)
X_6	1.009 (2.8)	-1.331 (1.8)	-1.801 (3.5)
X_7	.979 (3.7)	.670 (1.2)	.374 (1.0)
X_8	-.417 (2.1)	-.689 (1.7)	-.653 (2.3)
X_9	.388 (1.4)	-.685 (1.2)	-.634 (1.7)
X_{10}	.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

where

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 3rd and 6th 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)

Sources: Authors' calculations from:

1) X_2 to X_{10} - defined as before, see Table 3.

2) T - 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.

Table 7

Effects of Performance Measures on School Superintendents' Salaries: Annual Cross-Sections of "Stayers"[a] (absolute value of t statistics)

	1979-80	1980-81	1981-82	1982-83	Pooled 1979-80 to 1982-83
Model 1					
TP	-.026 (1.5)	-.029 (1.5)	-.008 (0.4)	.004 (0.3)	-.022 (2.3)
MP	.016 (1.7)	-.013 (1.5)	.004 (0.5)	.016 (2.0)	.005 (1.1)
Model 2					
TP	-.026 (1.5)	-.028 (1.5)	-.007 (0.4)	.005 (0.3)	-.022 (2.3)
AP	.016 (1.7)	-.003 (0.2)	.020 (1.7)	.012 (1.4)	.013 (2.3)

[a]Each equation also includes all of the variables found in Table 3. The pooled (across years) equations also include year dummy variables.

TP - tax performance measure = log (predicted tax rate) minus log (actual tax rate) in the previous academic year.

MP - math performance measure = log (predicted percentage of students who fell below state reference point on 6th grade math test) minus log (actual percentage) in the previous academic year.

AP - average educational performance measure = log (predicted average percentage of students who fell below state reference point on 3rd and 6th grade reading and math tests) minus log (actual percentage) in the previous academic year.

Positive values for each performance measure indicate above average performance.

Table 8

Salary Change Equations for Superintendents Who Stay in the Same Position or Move to Another Position in New York State[a]
(absolute value t statistics)

	(1)	(2)	(3)	(4)
C	.061 (37.9)	.077 (8.5)	.074 (9.6)	.079 (8.7)
Y81	.020 (7.3)	.010 (2.9)	.018 (6.3)	.010 (3.0)
Y82	.006 (2.3)	-.003 (0.5)	.003 (0.7)	-.004 (0.8)
M	.060 (10.0)	-.063 (5.0)	-.050 (4.7)	-.055 (4.4)
%ΔY		-.098 (1.2)	-.120 (1.7)	-.110 (1.4)
%ΔE		-.010 (0.2)	.010 (0.3)	-.004 (0.1)
%ΔA		.004 (0.6)	.004 (0.7)	.003 (0.5)
ΔMP		-.005 (1.7)		
ΔTP		.007 (0.6)		
MPB			.002 (0.8)	
TPB			.005 (1.0)	
MPL				.007 (2.5)
TPL				.008 (1.3)
M*%ΔY		.446 (5.3)	.411 (5.5)	.425 (5.0)
M*%ΔE		.120 (3.0)	.093 (2.9)	.105 (2.6)
M*%ΔA		.052 (4.1)	.013 (1.5)	.052 (4.1)
M*ΔMP		.052 (2.9)		
M*ΔTP		-.331 (4.5)		
$M*MP_B$			.009 (0.6)	
$M*TP_B$			-.013 (0.5)	
$M*MP_L$				-.038 (2.8)
$M*TP_L$				.067 (2.2)
n	2208	1200	1901	1210
$\bar{R}^2$	.066	.331	.260	.322

[a]Including the log of the base period salary as an additional explanatory variable only marginally affected the other coefficients.

Table 8 (continued)

where

Y81	1 if 1980-81 to 1981-82 change observation, 0 otherwise
Y82	1 if 1981-82 to 1982-83 change observation, 0 otherwise
M	1=move to another superintendency in New York State; 0=other
$\% \Delta Y$	change in the logarithm of per capita personal income in the county the superintendent's school district is located in from the base (first) to new (second) year
$\% \Delta E$	change in the logarithm of total enrollment in the superintendent's school district from the base to new year
$\% \Delta A$	change in the logarithm of the full value of property per enrolled student in the superintendent's school district from the base to the new year
ΔMP, ΔTP	change in the math test (tax rate) performance measure from the lagged (year prior to the base) to the base year
MP_B, TP_B	math test (tax rate) performance measure in the base year
MP_L, TP_L	math test (tax rate) performance measure in the lagged year

and

Correlation Matrix of Performance Measures

	MP_L	TP_B	TP_L
MP_B	.522	.082	.060
MP_L		.061	.066
TP_B			.891

Implied Effects of Performance Variables on the Salary Changes of Movers

(2)		(3)		(4)	
ΔMP	.047(2.6)	MP_B	.011(0.8)	MP_L	-.032(2.4)
ΔTP	-.324 (4.5)	TP_B	-.008 (0.3)	TP_L	.075(2.5)

Table 9

Multinomial Logit Analyses[a]
(absolute value t statistics)

	4-Way Dichotomy			3-Way Dichotomy	
	$\frac{P(move,\dot{S}>0)}{P(stay)}$	$\frac{P(move,\dot{S}\leq 0)}{P(stay)}$	$\frac{P(leave\ sample)}{P(stay)}$	$\frac{P(move,\dot{S}>0)}{P(stay)}$	$\frac{P(move,\dot{S}\leq 0)}{P(stay)}$
C	45.263 (4.2)	13.167 (1.0)	-5.494 (1.3)	43.996 (4.1)	13.193 (1.0)
Y81	.645 (1.8)	.071 (0.1)	.530 (2.3)	.656 (1.8)	.114 (0.2)
Y82	-1.670 (2.8)	.149 (0.2)	.054 (0.2)	-1.671 (2.7)	.180 (0.3)
MP_L	-.128 (0.4)	-.448 (0.8)	-.255 (1.1)	-.147 (0.4)	-.487 (0.9)
TP_L	1.466 (2.0)	-2.006 (1.7)	-.176 (0.4)	1.460 (2.0)	-2.136 (1.7)
CDEG	.050 (0.1)	-.029 (0.0)	-.194 (0.4)	.063 (0.1)	-.035 (0.0)
DDEG	1.307 (3.0)	.586 (0.9)	.368 (1.3)	1.292 (2.9)	.579 (0.9)
AGE	-.062 (1.9)	-.049 (0.8)	.089 (3.8)	-.055 (1.7)	-.045 (0.8)
TEN	-.014 (0.2)	.075 (1.1)	-.004 (0.1)	-.020 (0.3)	.071 (1.0)
EXP	.121 (3.0)	.144 (2.2)	-.086 (0.7)	.120 (3.0)	.144 (2.2)
LENR	-.009 (0.3)	.039 (0.1)	.037 (0.3)	-.056 (0.2)	.039 (0.1)
$\dot{L}FULL$	-.202 (0.7)	.164 (0.8)	-.164 (1.1)	-.256 (0.9)	.156 (0.8)
LMFI	-4.637 (3.9)	-1.927 (1.4)	-.254 (0.5)	-4.462 (3.7)	-1.946 (1.4)

[a]Also included in the analyses were dummy variables for nonreporting of age, tenure at base year job, and experience as a superintendent on previous jobs.

	4-Way Dichotomy	3-Way Dichotomy
Total Observations	1,408	1,272
Stayers	1,207	1,207
Move, $\dot{S}>0$	46	46
Move, $\dot{S}\leq 0$	19	19
Leave Sample	136	-

where:

CDEG	1=superintendent has a certificate of advanced study, 0=other
DDEG	1=superintendent has a doctorate, 0=other
AGE	superintendent's age
TEN	superintendent's tenure in current job
EXP	superintendent's years experience as a superintendent in previous jobs
LENR	logarithm of total enrollment in base year school district
LFULL	logarithm of full value per pupil in base year school district
LMFI	logarithm of 1979 median family income in base year school district

Table 10

Summary of Performance Variable Coefficients, Various Multinomial Logit Specifications: 4-Way Dichotomy[a]
(absolute value t statistics)

	$\frac{P(move,\dot{S}>0)}{P(stay)}$	$\frac{P(move,\dot{S}\leq 0)}{P(stay)}$	$\frac{P(leave\ sample)}{P(stay)}$
MP_B	-.173 (0.6)	-.588 (1.2)	-.200 (1.2)
TP_B	.278 (0.4)	-1.322 (1.4)	-.075 (0.2)
MP_L	-.128 (0.4)	-.449 (0.8)	-.255 (1.2)
TP_L	1.466 (2.0)	-2.001 (1.7)	-.176 (0.4)
MP_B	-.461 (1.0)	-.057 (0.1)	-.071 (0.3)
TP_B	-1.505 (0.9)	1.203 (0.7)	.464 (0.5)
MP_L	.069 (0.1)	-.893 (1.3)	-.209 (0.8)
TP_L	2.778 (1.9)	-2.646 (1.4)	-.509 (0.5)
ΔMP	-.273 (0.8)	.324 (0.6)	.056 (0.3)
ΔTP	-2.355 (1.6)	1.403 (0.9)	.391 (0.4)

[a]Also included in each model were all of the explanatory variables found in the models in Table 9. When either the logarithm of the base year salary, the residual from a salary equation that included only characteristics of the superintendent, the residual from a salary equation that included characteristics of the superintendent and the school district in which he was employed, or the residual from salary equations that also included performance measures, were included in the models, the pattern of signs and significance of the coefficients in this table were not altered. Moreover, neither the wage level, nor any of the residuals, ever proved to be statistically significant.