Principals as Agents:
An Empirical Analysis of the Labor Market for Public School Administrators

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March 2007 draft

1. Introduction

Monitoring and incentives are at the heart of any potential solution to an agency problem. Recent efforts to improve public school education in the United States have devoted considerable attention to monitoring – developing standards, implementing tests, and quantifying student and campus performance. In this paper, we examine incentives, with a focus on public school principals. We argue that principals are crucial agents in the production of public school education. Much as a CEO managing a firm acts as an agent under the direction of shareholders, a principal performs managerial responsibilities and provides instructional leadership for his or her campus on behalf of the school board (and the citizenry at large). Providing appropriate incentives for public school principals to engage in (costly) effort, thus, may be critical to improving public schools.

In particular, this paper investigates the extent to which the labor market for school principals may act as a mechanism for providing such incentives. Since there is considerable potential for employment mobility across campuses, substantial salary heterogeneity among schools, and opportunities for promotion to district-level administrative positions, principals may be able to significantly increase their lifetime earnings based on the performance of the schools they manage. Indeed, the performance monitoring done through student achievement testing may generate the information needed to reward principals' effort through the labor market. Our analysis will explore the role of career concerns in the context of public school education – how different administrators at different stages of their careers may respond to the incentives provided by the internal and external labor markets.

Empirically, we study the effects of a school's performance on the mobility and career advancement opportunities of its administrative leader.[1] We exploit a unique dataset, assembled from all public schools in the state of Texas from 1989 through 2006. The dataset combines the "monitoring" information – detailed campus-level scores from state-administered standardized tests – and the "incentives" information – the complete employment and wage histories of all school principals during this period. With this information, we can examine the labor market from two sides. On the labor demand side, we can analyze the school's decision over who to hire and retain and how much to pay. We are particularly interested in the extent to which past performance (as measured by test scores) factor into these decisions. On the labor supply side,

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[1] Bertrand and Schoar (2003) is a good example of an analogous study in the CEO literature.

we can make inferences about the relationship between the potential for administrators to gain from mobility and the performance of the campuses under their management.

Thus, our analysis contributes to two previously distinct literatures. The first is the empirical personnel economics literature, which has recently begun to exploit matched employer-employee datasets to test various theories about careers in organizations and the relationship between internal and external labor markets.[2] Our data on Texas public school administrators are ideal for such an application for several reasons: (1) we have a complete panel with a large number of hiring organizations; (2) turnover and promotion happen almost exclusively within the schools and districts in our sample; (3) there is considerable variation in the size of schools and the organizational structure of school districts; (4) wage data are included and represent the bulk of employee compensation (e.g., no stock options to consider); and (5) school test scores provide a universal metric on which the performance of employees in the dataset can be evaluated. These attractive features present the opportunity for drawing, from this particular analysis, more general conclusions about the interaction between organizational structure and both internal and external labor markets. Prior empirical studies in this literature have tended to focus on evaluating a specific theoretical implication, owing to datasets that were strong on only one or two of these dimensions. Prominent among these include papers on CEO and upper-level management turnover (e.g., Weisbach, 1987; Hayes, Oyer and Schaefer, 2005); career concerns of mutual fund managers (e.g., Chevalier and Ellison, 1999); and promotion and turnover among bank managers (e.g., Blackwell, Brickley and Weisbach, 1994).[3]

The paper also complements the education literature on the impact of accountability and performance evaluation programs in public schools. In particular, a stream of this literature (e.g., Jacob and Levitt, 2003; Jacob, 2005; Cullen and Reback, 2006; Chakrabarti, 2006) demonstrates that these performance measures are often manipulated in a variety of ways (some subtle, some not). Microeconomic foundations for this sort of gaming behavior may be found by exploring the relationship between school performance and rewards received by individuals employed by schools. As mentioned above, we posit the agency relationship as between the school district (representing the public) as the principal and the school's administrator (not the "school" itself)

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[2] Surveys of the relevant theories in these areas include, for example, Gibbons and Waldman (1999) and Lazear and Oyer (2004).

[3] A recent working paper by Heutel (2006) addresses some of these issues in the public education context, but uses aggregate district pay scale data rather than individual employee data to find empirical support for various theories.

as the agent. A campus principal may engage in costly effort to improve the performance of his or her school. We document the return to providing that effort in terms of future wage and employment outcomes.

2. Relevant background on the principal labor market in Texas

Principals in Texas arise from the teacher pool, often transitioning through assistant principal positions. This is natural given that principals are required to have completed two years of successful classroom teaching, as well as to have completed an approved certification program for principals and a Master's degree (19 TAC Chapter 241). Although the state mandates the minimum base salary that districts must pay teachers according to years of experience, there are no such restrictions for administrative positions. So, while teacher pay is largely determined by non-market forces,[4] there is substantial scope for districts to reward sought-after principals and superintendents.[5]

Success for an administrator depends on the ability to manage a broad set of activities, including instruction, personnel, budget and community relations. Over the past decade, the emphasis on principals as providing instructional leadership has increased. Texas first instituted a school accountability system in 1994, under which campuses are assigned to ratings categories based on student achievement and attainment levels. Since then, the system has been continually refined and more comprehensive performance indicators have been added. The most dramatic reform took place in 2003 with the introduction of new curriculum-aligned standardized tests.

The principal is the key agent responsible for mobilizing staff and resources to meet these performance standards. Among the domains used to evaluate principals, the Texas Education Code (Subchapter BB, 150.1021) recommends the use of the campus performance objectives underlying campus ratings. In support of this recommendation, legislation was passed in 1995 to provide explicit financials awards to principals based on campus performance – though this program was quickly amended to require that the awards be distributed to the schools instead. One of the goals of this paper is to explore the extent to which successful principals are rewarded

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[4] Despite the fact that the state regulations impose some standardization, pay practices vary widely across districts even for teachers, with some offering higher starting salaries for new teachers, advanced degrees, and high attendance (Clark and Toenjes, 1997). Only a small fraction of campuses have implemented performance pay for teachers.

[5] Until 2003, schools were prohibited from hiring principals into the tenured category. The inability to offer long-term contracts may have affected turnover prior to then.

by better salaries and better positions, if not explicit state-sanctioned bonus payments.

3. Data

We use two primary data sources. The first is the Public Education Information Management System (PEIMS). These data are available for the fiscal years 1989 through 2006, and were provided to us by the Texas Education Agency (TEA). We requested information about all individuals employed by the Texas public school system in teaching, support, and administrative roles. Importantly, a person-specific identifier allows us to track individuals across years and as they move across campuses and districts. These data include person-specific information such as gender, ethnicity, date of birth, educational degree, current position and base pay, as well as campus and district identifiers. Table A-1 lists the roles for which we have data and a brief corresponding job description. Table A-2 describes the raw data, in terms of the number of individuals in each role and the average annual salary for each year in the dataset.

The second data source is the Academic Excellence Indicator System (AEIS).[6] These data are collected annually and provide detailed campus-level information on student demographics, student performance, and staffing, as well as campus- and district-level financial information. We currently have compiled comparable information for the years 1992 through 2006. We intend to request the more limited data that are available for the years 1989-91 in order to extend our analysis further back over the period prior to school accountability. Most of the variables are self-explanatory and used as given, other than the financial variables which are converted to constant 2006 dollars using the CPI for all urban goods.

The variables that require more explanation are the performance measures. Students are tested on statewide standardized exams every Spring. The Texas Assessment of Academic Skills (TAAS) was administered over the period 1990-2002. Students were tested in reading and mathematics in grades 3-8 and 10, and in writing in grades 4, 8 and 10. Spanish exams for grades 3-6 were phased in starting in 1997, and a special assessment for special education students was introduced in 2001. The Texas Assessment of Knowledge Skills (TAKS) replaced the TAAS in 2003. These more comprehensive curriculum-based exams include reading (or language arts) and mathematics exams in grades 3-11, as well as writing, science, and social studies exams for subsets of these grades.

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[6] These data are available for download on the TEA website located at http://www.tea.state.tx.us/perfreport/aeis/.

We created a summary measure of student achievement that is defined as consistently as possible across years. We averaged the campus-level pass rates on reading and mathematics, which themselves are averaged across all tested grades. The passing standards for the TAAS remained constant across years, but were phased-in for the TAKS. For the TAKS, we use the pass rates relative to the fully phased-in standards for all years. The pass rates are based on the accountability subset in each year. This subset excludes students exempted for a variety of reasons (e.g., moved to the district mid-year, limited English proficient, special education), and increases in coverage over the period due to reductions in the types of allowable exemptions. To minimize the role of secular changes in measurement, we define the campus "achievement level" to be the mean pass rate, standardized to have a zero mean and a unit standard deviation in a student-weighted distribution.

As one way to characterize the potential attractiveness of campuses to principals, we also calculated a "predicted achievement level" measure. We ran initial regressions of the average pass rate on student demographic and district financial variables, separately by year.[7] We then used the estimated coefficients to predict the pass rate at each campus, and standardized the prediction to have a zero mean and a unit standard deviation in a student-weighted distribution. A value of zero indicates that the campus characteristics are such that its students are predicted to perform at the same level as the campus attended by the average student. Campuses with positive (negative) values have attributes that predict higher (lower) aggregate achievement.

The same regressions were used to calculate a crude "productivity" measure specific to each campus and year. Here, we extracted the residuals, and standardized them in the same way. A value of zero indicates the campus is performing just as expected given its context. A positive value implies the campus is performing better than expected, and a negative value is consistent with underperformance.

The test pass rates are key determinants of the rating that each campus receives, along with dropout and attendance rates. Campuses are designated as Exemplary, Recognized, Acceptable, or Low Performing depending on how performance relates to the standards in place in each year.

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[7] The campus-level student variables included are: grade distribution, race/ethnicity distribution, fraction economically disadvantaged, fraction moving to the campus mid-year, fraction included in the accountability subset, logarithm of enrollment. The district-level variables included are: logarithm of enrollment, logarithm of per pupil property value, and fraction of property wealth that is residential, as well as indicators for each of the 20 Education Service Center regions. The regressions are ordinary least-squares regressions and are weighted by campus enrollment.

Campuses receiving higher ratings are eligible for various awards and freed from some regulations, while Low Performing campuses are subject to successively invasive interventions.

4. Empirical analysis

This section describes our preliminary analyses of the data. We in turn present statistics from the perspective of campuses hiring principals (the "demand-side" of the labor market), and then from the perspective of individual employees (the "supply-side"). The underlying data for the analyses are the same, so while different features of the data are highlighted in each subsection, the findings are broadly consistent across the two perspectives. Our focus here is on campus principals; as such, the corresponding supply-side description includes PEIMS data for individuals who were ever principals over the time period of our sample. We do keep part of the non-principal employment histories of these individuals, in order to document the effects of transitions into and out of being a principal from other positions.

4.1 Demand-side: Campus-level analysis

The results described in this section span the years 1994 through 2006, beginning with the first year under the campus accountability system. For this campus-level analysis, we start with the AEIS sample of all campuses serving students in the years 1994 through 2006, and match these to principals from the PEIMS. We then exclude alternative education campuses, such as juvenile detention, residential treatment, and early education centers. These campuses are either not subject to the standard accountability system or do not serve students in tested grades. We drop an additional 13.6 percent of regular campuses that never or rarely report having a full-time principal, share duties across equally multiple principals, or do not appear in consecutive years in the AEIS. There are a total of 6,254 regular campuses represented in the analysis sample across the years, and the typical campus is represented in the sample for 11.4 of the 13 years.

Table 1 shows the number of campuses in each year and the share in each year that experiences principal turnover. On average, there are about 5,500 campuses per year, with the number increasing over time as new campuses are opened. The turnover rate is forward-looking, and represents the fraction of schools that do not have the same principal in the following year. Turnover is substantial over the sample period, with nearly one in five schools hiring a new principal each year. There is limited year-by-year variation, but turnover is slightly higher in the

second half of the period than the first.

Table 2 breaks down average turnover according to a few salient campus characteristics. In terms of students served, the turnover rate is lowest (16.7 percent) for elementary school campuses, higher (20.4 percent) for middle schools and highest (22.7 percent) for high schools. Campus ratings and performance on standardized exams also appear to be quite important. Campuses rated in successively lower categories have correspondingly higher turnover, peaking at 32.1 percent of campuses rated in the Low Performing category for a given year. The relationship seems to be moderated by our "productivity" measure. For example, among Low Performing and Acceptable campuses, those that also performed poorly relative to similarly situated schools turned over their principals even more often (.329 vs. .272 and .210 vs. .181). The reverse pattern holds for Exemplary schools, in that higher productivity is associated with higher turnover (.161 vs. .148). These differences may reflect push vs. pull factors underlying turnover.

These raw percentages are confirmed in the campus-level principal turnover regression results reported in the first three columns of Table 3. In each of the three listed specifications, we ran a probit whose dependent variable was one if the campus had a new principal in the following year. In addition to the campus-level performance measures listed in the table, we control for a detailed set of campus and district level control variables (described in the notes to the Table), along with region and year fixed effects. According to the results in column 1, as compared to campuses rated as Exemplary, Recognized schools were 1.6 percentage points more likely to change principals the following year. Acceptable schools were 4.2 percentage points more likely, and Low Performing schools were 16.3 percentage points more likely. Column 2 shows that schools that scored lower on achievement tests than otherwise similar schools were more likely to change principals in the following year. A one standard deviation fall in the pass rate is associated with an increase in turnover of 3.4 percentage points. Controlling for both ratings and achievement levels at the same time (column 3) mitigates the independent role of ratings, as expected.

The final columns in Tables 1–3 provide complementary statistics on salaries. According to Table 1, salaries are relatively widely dispersed. The median salary is 1.22 times the salary at the 10th percentile, and the salary at the 90th percentile is the same multiple of the median salary. The 90-10 ratio is relatively stable (around 1.5) across years. Although median salaries do not

vary dramatically by our campus classifications, Table 2 shows that median salary increases with the grade level of the school and has a U-shaped relationship with ratings level. Within ratings categories, median salary is higher among more productive than among less productive schools, except for campuses in the highest ratings category. The regression results for log base salary in Table 3 uncover patterns that are more consistent across campus performance groups. That is, conditional on campus characteristics, pay declines steadily with ratings category and increases with campus pass rates. In results from specifications not shown, the wage gradient with respect to productivity is steepest for Exemplary campuses and declines to be near-zero for Low Performing campuses.

4.2 Supply-Side: Principal-level analysis

In this subsection, we analyze the same data from the perspective of individuals. The results describe various aspects of the labor market experience of school principals. As described above, the dataset for analysis contains only those individuals who ever were (full-time) principals (at regular campuses) from 1994 through 2006. This leaves us with 14,723 individuals whose careers we track over the sample period. We include all years for all of these individuals' "spells" as principals at various campuses, as well as their positions before and after being employed as a principal where applicable.

We start with the top panel of Table 4, which provides details on the job transitions from one year to the next for individuals who were full-time campus principals in the years 1994 through 2005 (we do not yet know what those individuals who are principals in 2006 will be doing the following year). The top panel of the table indicates that nearly 78 percent of campus principals stay at the same position the next year – or about 22 percent switch jobs from one year to the next. In terms of the roles taken by principals who leave their current position, about 7.5 percent become principals at different schools, 5.2 percent at different campuses within the same district and 2.3 percent at campuses in different districts. About four percent are promoted to district-level positions (just over one-third of these are to administrative positions like superintendent or assistant superintendent) and a slightly lower percentage take positions that are subordinate to another principal, typically as a teacher or an assistant principal. The final category includes those individuals who do not appear at all in the data the following year. We suspect that many of these may be transitions into retirement, as the principals in this category are substantially

older than the rest of the sample. The bottom panel of Table 4 confirms that first-time principals typically come from the ranks of teachers and assistant principals.

Tables 5 and 6 examine the various job transitions more closely. The average wage growth and changes in school attractiveness (as summarized by our predicted achievement measure) associated with job transitions are displayed in Table 5. These demonstrate the opportunity for principals to increase their salary and/or school context through job mobility. If a principal remains in the same position, the average real wage increase is 1.6 percent per year, but if he or she changes schools it can be substantially higher. For new positions in the same district real wages increase by 4.1 percent, and for positions in a different district the new real wage is 6.5 percent higher. Individuals who accept a new position as a district-level administrator do even better in terms of salary, with new salaries that are 7.3 percent higher in real terms. However, if the principal changes to a lower-level position within the campus, the real wage goes down by 3.8 percent on average. An important caution to interpreting these cross-sectional patterns is the likelihood that they reflect not only differences across positions, but also differences across the principals who either choose or have imposed on them each transition.

The relationships between wage growth and the evolution of campus attractiveness do not suggest systematic trade-offs between the two for the typical transition. In fact, the campus-level transition that is associated with the highest average wage gains is also associated with the greatest average improvements in schooling environment. A caution to interpreting these

Table 6 breaks the job transition and real wage changes down by the accountability rating achieved by the campus where the principal is currently working. In other words, we can see the effect of the school rating in period t on relative employment and wage outcomes in period $t+1$. These results suggest that the accountability scores may have a substantial impact on future opportunities. For example, the top row in the table indicates that principals whose schools are rated as Exemplary have the highest probability of remaining in their current position (80.1 percent), while principals in Low Performing schools keep their jobs into the following year only 60.7 percent of the time. For those remaining, real wage increases are highest for those leading Exemplary schools (1.8 percent) and lowest for the Low Performing ones (1.3 percent). While principals at Low Performing schools transition into higher paying positions more frequently (in percentage terms), their relative wage growth upon "promotion" is much less (only 3.7 percent in the case of district-level positions, as compared to 11.1 percent for those who led

Exemplary schools).

The patterns implied by the regression results in Table 7, which condition on current-year campus and individual controls, are broadly consistent with the unconditional patterns. Here the dependent variable is the change in log wages from the current year to the next. The coefficient estimates are reported only for the key control variables of interest, which describe the ratings category and achievement level at the current school. Since the excluded ratings category is Exemplary, the results in columns 1–2 demonstrate that the lower the category the smaller is the wage increase. Interestingly, the campus achievement level (standardized pass rate) also enters positively and significantly – suggesting that there is an independent effect beyond the most salient summary statistic provided by TEA. The coefficient estimate suggests that a one standard deviation improvement in campus achievement is associated with real wage growth that is approximately 1.5 percentage points higher. Principals of schools that have shown academic improvement also seem to experience greater wage gains (columns 3–4), whether that improvement comes with a boost in ratings or not. Note that there is very little change in any of these results when individual-level controls are added to the regression along with the campus-level controls (right column of each pair of results).

5. Discussion

The results that we have assembled so far provide very suggestive evidence that individual incentives – in the form of improved future employment opportunities – may be provided by the combination of principal mobility and the information provided by the accountability systems. Principals whose schools do better get paid more and have a greater chance of getting promoted to higher paying positions at other schools and at the district level. On the other hand, principals whose schools do worse experience lower wage growth and leave their jobs much more often. Understanding the labor market for administrators may be a key element to addressing the agency problem in public education, and can help to explain why school leaders provide effort to improving their schools, and why some may find it so tempting to manipulate accountability standards.

As we proceed through this project, we will explore the operation of the labor market for administrators at a more micro level. In particular, differences in administrator age, the extent of geographic labor markets, district size, and campus context (especially expected performance)

may be associated with different incentives for improving school performance. We would also ideally like to test for changes in the implicit rewards for campus achievement from before to after the introduction of the accountability regime. Our more nuanced understanding of this labor market will allow us to directly evaluate various theories in personnel economics. In addition, we may have policy suggestions for how to improve the measured incentive effects and make the accountability programs more effective.

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Table 1: Campus-level principal turnover descriptive statistics, by year

Year	Number of Campuses	Turnover rate	Base salary ($2006)		
			10th percentile	Median	90th percentile
1994	5,029	.169	54,773	67,233	81,326
1995	5,074	.175	54,752	67,147	81,328
1996	5,136	.180	55,250	67,639	82,382
1997	5,230	.180	56,350	68,087	82,901
1998	5,300	.184	57,492	69,159	84,117
1999	5,382	.171	57,624	69,834	85,477
2000	5,459	.211	58,914	71,368	86,788
2001	5,555	.188	59,065	71,748	86,995
2002	5,634	.211	59,651	72,949	88,856
2003	5,718	.188	59,572	73,245	88,748
2004	5,785	.205	58,909	72,566	88,369
2005	5,861	.174	58,248	71,340	86,690
2006	5,914	-----	58,089	70,893	86,319
Average	5,467	.187	57,497	70,276	85,858

Notes: The sample consists of all regular campuses for the years 1994 through 2006, as described in the text. The turnover rate is the fraction of campuses headed by a new principal in the following year.

Table 2: Campus-level principal turnover descriptive statistics, by campus characteristics

	Share of campuses	Turnover rate	Median base salary
Overall	1.00	.187	70,276
By campus type			
Elementary	.607	.167	69,836
Middle	.209	.204	71,514
Secondary	.163	.227	72,605
By campus ratings category			
Exemplary	.142	.156	71,914
and below median "productivity"	.049	.148	73,917
and above median "productivity"	.093	.161	70,557
Recognized	.300	.174	69,751
and below median "productivity"	.101	.176	68,674
and above median "productivity"	.198	.174	70,352
Acceptable	.541	.198	70,036
and below median "productivity"	.335	.210	69,243
and above median "productivity"	.207	.181	71,220
Low Performing	.018	.321	73,004
and below median "productivity"	.015	.329	73,000
and above median "productivity"	.002	.272	77,645

Notes: The sample consists of all regular campuses for the years 1994 through 2006, as described in the text. The turnover rate is the fraction of campuses headed by a new principal in the following year. The first row averages across all campuses and years, while the remaining rows show this rate among subsets of campuses as indicated.

Table 3: Campus-level principal turnover regression results

Independent variable	Indicator for new principal in following year			ln(base salary)		
	(1)	(2)	(3)	(4)	(5)	(6)
Ratings category						
Recognized	0.016 (0.005)		0.010 (0.005)	-0.014 (0.002)		-0.011 (0.002)
Acceptable	0.042 (0.005)		0.016 (0.006)	-0.027 (0.002)		-0.017 (0.002)
Low Performing	0.163 (0.017)		0.095 (0.017)	-0.043 (0.005)		-0.023 (0.005)
Achievement level		-0.034 (0.002)	-0.028 (0.003)		0.014 (0.001)	0.011 (0.001)

Notes: The sample consists of all regular campuses for the years 1994 through 2005 as described in the text. The dependent variable is an indicator for a new principal at the campus in the following year in columns 1-3, and is log base salary for the current principal in columns 4-6. Controls for the academic performance of the campus are varied across the columns as shown. All specifications otherwise include the same set of control variables: at the campus level: student grade distribution, student race/ethnicity distribution, student economic disadvantage and LEP rates, *ln*(enrollment); at the district level: *ln*(district enrollment), *ln*(district wealth per pupil), percent district property wealth residential, indicators for 20 educational service center regions; and year fixed effects. The turnover regressions are estimated using a Probit specification, and marginal effects evaluated at the sample means are shown. The log wage regressions are estimated via ordinary least squares. In all cases, standard errors robust to arbitrary correlation across campuses over time are shown in parentheses. The omitted ratings category is "Exemplary."

Table 4: Individual-level job transition matrices

	Number	Percentage
Transitions for full-time principals 1994–2005		
Remained principal at same campus following year	53,452	.777
Became principal at a different campus in the same district	3,573	.052
Became principal at a different campus in a different district	1,549	.023
"Promoted" to district-level administration/support position	2,652	.039
Principal to superintendent or assistant superintendent	1,004	.015
Principal to district-level support position	1,648	.024
"Demoted" to teacher, asst. principal or campus support position	2,377	.034
Principal to teacher	1,029	.015
Principal to campus-level support position	288	.004
Principal to assistant principal	1,060	.015
Became a part-time principal (any campus)	918	.013
Left the sample	4,301	.063
Total	68,822	
Transitions into first position as a full-time principal 1994–2006		
Teacher to principal	1,905	.172
Campus-level support position to principal	868	.078
Assistant principal to principal	6,567	.593
District-level support position to principal	600	.054
Superintendent or Asst. Superintendent to principal	159	.014
Part-time principal to principal	981	.089
Total	11,080	

Notes: The sample in the top panel consists of all individuals who are current (year t) full-time principals at regular campuses for the years 1994 through 2005. The transitions rates are based on the positions held by these full-time principals in the following year ($t+1$). The sample in the bottom panel includes all individuals who appear for the first time as a full-time principal at a regular campus in one of the years 1994 through 2006. Here, the transition rates are based on the positions held by these new full-time principals in the prior year ($t-1$).

Table 5: Overall wage changes by job transition category

Transitions for full-time principals 1994–2005	Fraction of sample	Percentage Change in Real Wage	Change in predicted achievement
Remained principal at same campus following year	.777	.016	-.010
Became principal at different campus, same district	.052	.041	-.009
Became principal at different campus, different district	.023	.065	.134
"Promoted" to a district-level admin/support position	.039	.073	----
"Demoted" to subordinate campus-level position	.034	-.038	.009
Became part-time principal (any campus)	.013	.028	.041
Left the sample	.063	----	----
Total	1.00	.019	-.005

Notes: The sample consists of all individuals who are current (year *t*) full-time principals at regular campuses for the years 1994 through 2005. The transitions rates are based on the positions held by these full-time principals in the following year ($t+1$). The percentage change in the real wage is the difference in base salary (in $2006) between the next-year and current jobs, relative to the real wage at the current job. The change in predicted achievement from the current-year to the next-year campus is meant to capture whether the new campus context is generally a more or less attractive one. This variable is only defined for transitions to campus-level positions.

Table 6: Job transitions and wage changes by campus performance category

| *Campus-role transitions, for principals 1994 through 2005* | Campus Accountability Rating Category | | | | | | | |
| | Exemplary | | Recognized | | Acceptable | | Low Performing | |
	Share in transition category	Percent Change in Real Wage	Share in transition category	Percent Change in Real Wage	Share in transition category	Percent Change in Real Wage	Share in transition category	Percent Change in Real Wage
Remained principal at same campus following year	.8`0	.018	.793	.015	.769	.016	.607	.013
Became principal at different campus, same district	.042	.043	.048	.044	.053	.039	.064	.033
Became principal at different campus, different district	.018	.078	.022	.075	.024	.059	.036	.056
"Promoted" to a district-level admin/support position	.036	.111	.034	.081	.041	.065	.073	.037
"Demoted" to subordinate campus-level position	.022	-.023	.029	-.048	.038	-.037	.102	-.044
Became part-time principal (any campus)	.016	.036	.014	.04`	.011	.023	.022	-.041
Left the sample	.056	----	.060	----	.064	----	.096	----

Notes: See the Notes to Table 5.

Table 7: Individual-level wage change regression results

Independent variable	Dependent variable = log of wage increase the following year ($t+1$) for individuals							
	(1)		(2)		(3)		(4)	
Ratings category (t)								
Recognized	-.0028	-.0030	-.0024	-.0026				
	(.0012)	(.0012)	(.0012)	(.0012)				
Acceptable	-.0035	-.0039	-.0021	-.0023				
	(.0010)	(.0010)	(.0012)	(.0016)				
Low Performing	-.0103	-.0110	-.0074	-.0078				
	(-.0031)	(.0031)	(.0033)	(.0033)				
Achievement level *(t)*			.0014	.0015				
			(.0005)	(.0005)				
Change in ratings category *(t −1 to t)*					.0017	.0017	.0007	.0007
					(.0006)	(.0006)	(.0007)	(.0007)
Previous-year's ratings category (t −1)								
Recognized					-.0025	-.0027	-.0021	-.0023
					(.0012)	(.0012)	(.0012)	(.0012)
Acceptable					-.0038	-.0042	-.0028	-.0032
					(.0014)	(.0013)	(.0014)	(.0014)
Low Performing					-.0145	-.0153	-.0130	-.0136
					(.0067)	(.0066)	(.0065)	(.0066)
Change in Achievement level *(t −1 to t)*							.0024	.0024
							(.0008)	(.0008)
Previous year's Achievement level *(t −1)*					.0003	.0005	.0013	.0015
					(.0005)	(.0005)	(.0006)	(.0006)
Includes principal characteristics	No	Yes	No	Yes	No	Yes	No	Yes

Notes: The sample consists of all individuals who are current (year *t*) full-time principals at regular campuses for the years 1994 through 2005. The dependent variable in all cases is the change in log wages. This wage growth measure is the difference in log base salary (in $2006) between the next-year and current jobs. Controls for the academic performance of the current-year campus are varied across the columns as shown. Also, the right-most set of results within each columns adds individual principal characteristics, such as age, gender, race/ethnicity, and highest educational degree obtained. All specifications otherwise include the same set of control variables described in the Notes to Table 3. The regressions are estimated by ordinary least-squares. Standard errors robust to arbitrary correlation across observations from the same principal over time are shown in parentheses. The omitted ratings category is "Exemplary."

Table A-1: Staff roles

Staff type	Code	Description
Teacher	029	A professional employee required to hold a valid teacher certificate or permit in order to perform some type of instruction to students.
Assistant Principal	003	Assists the principal of a particular campus in any duties the principal may deem appropriate.
Principal	020	Serves as the instructional leader of the school whose duties include selecting teachers for the campus, setting education objectives, developing budgets for the campus, and working with school professionals to prepare individual development plans.
Campus-level Professional Support Staff		
Counselor	008	Provides guidance and counseling services to students.
Supervisor	028	Supervisor of teachers who provides consultant services to teachers in a grade level, adjacent grades, in a teaching field or group of related fields.
Teacher Facilitator	041	Serves as exemplary role model in assisting teachers with improving their classroom performance.
Department Head	054	Serves as head or chairman of a subject area department on a campus.
Other campus professional personnel	058	Serves as a professional staff member at a single campus. Some examples are campus/community liaisons, campus volunteer coordinators, dean of boys, dean of girls, and instructional officers assigned to a single campus.
District-level Administrative Staff		
Superintendent	027	The educational leader and administrative manager of the school district.
Asst. Superintendent	004	Assists the superintendent of a particular school district in any duties the superintendent deems appropriate. Persons assigned to this role usually perform functions associated with more than one campus.
District-level Professional Support Staff		
Instructional Officer	012	Serves under the superintendent, or higher grade instructional administrative officer, as the key specialist for a major instructional or pupil service program.
Other non-campus professional personnel	080	These are professional, non-instructional staff. Includes administrators/non-instructional department heads, other supervisory staff, and any other professional level staff in a functional area (food service, maintenance and operations, …) at the district level.

Notes: The source for these definitions is the TEA document titled "About Staff 2006," available on the web (http://www.tea.state.tx.us/adhocrpt/abstf06.html).

Table A-2: Raw data from PEIMS Personnel Data Files, 1989-2006

Year	Teachers		Assistant Principals		Principals		Campus-level Professional Support Staff		District-level Administrative Staff		District-level Professional Support Staff	
	No. of positions	Median wage	No. of positions	Median wage	No. of positions	Median wage	No. of positions	Median wage	No. of positions	Median wage	No. of positions	Median wage
1989	204,378	23,996	3,656	35,250	5,608	40,187	8,743	32,477	3,630	44,001	---	---
1990	208,392	25,060	4,009	36,312	5,743	42,398	10,052	33,554	3,551	46,884	---	---
1991	215,437	26,070	4,226	38,961	5,769	44,700	11,313	35,154	3,466	49,029	---	---
1992	223,041	26,850	4,490	40,179	5,829	46,148	11,720	36,026	3,470	51,000	---	---
1993	231,033	27,817	4,479	41,533	5,971	47,710	13,455	36,939	1,779	59,173	5,270	44,500
1994	238,137	28,557	4,849	42,410	6,039	48,915	13,482	37,437	1,747	60,824	5,600	45,411
1995	246,114	29,091	5,106	43,410	6,116	50,251	14,112	38,009	1,758	62,682	6,127	46,109
1996	253,423	31,300	5,396	44,505	6,214	52,028	14,497	39,288	1,767	65,000	6,933	46,104
1997	260,955	32,072	5,630	45,738	6,397	53,698	14,809	40,595	1,960	65,335	7,984	46,993
1998	268,585	33,090	5,975	46,819	6,542	55,268	15,665	41,960	1,841	69,446	8,075	49,000
1999	273,274	33,642	6,266	47,949	6,669	57,000	15,974	42,940	1,865	71,527	9,508	48,507
2000	282,301	36,842	6,573	50,676	6,817	60,343	16,502	46,150	1,970	74,477	10,239	51,449
2001	288,783	37,299	6,997	52,512	6,968	62,127	19,133	46,748	1,919	77,135	11,467	52,268
2002	298,744	37,999	7,317	53,781	7,088	64,201	20,118	47,778	2,066	79,254	20,561	38,625
2003	304,717	38,676	7,620	54,891	7,142	65,858	20,597	48,380	2,051	82,400	12,585	55,014
2004	307,192	39,162	7,764	55,436	7,208	67,689	22,696	48,529	2,054	84,500	12,613	55,718
2005	313,474	39,921	8,062	56,395	7,347	68,231	22,916	48,651	2,043	87,633	12,936	56,662
2006	321,943	40,608	8,384	57,261	7,443	69,872	23,839	49,619	2,084	89,916	13,286	58,350

Notes: A "position" in the data is a campus-role combination; since a single individual occasionally holds more than one position simultaneously (either filling more than one role on the same campus or the same role at more than one campus) the number of positions exceeds the number of individuals in the dataset. See Table A-1 for a description of the six position categories in this table. Wages are base salaries (excluding bonuses) and are in nominal dollars.